

Original Article

Assessment of the knowledge of Algerian dentists and dental students in orofacial pain field

Évaluation des connaissances des dentistes et des étudiants en médecine dentaire algériens dans le domaine de la douleur oro-faciale

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Abstract

Introduction: Dentists are the primary healthcare providers for patients with orofacial pain. This study aimed to assess the level of knowledge of dental physicians and dental students in the diagnosis and treatment of orofacial pain. **Methods:** We carried out a cross-sectional study using two online questionnaires distributed between May 10 and July 10, 2021. We included dentist students and dentists practicing in any public or private establishment in Algeria. The data collected was coded and introduced in Excel software. **Results:** A total of 150 dentists and 303 students participated in the study. The majority of dentists reported a higher frequency of temporomandibular disorders (30%) compared to other orofacial pain. The dentists' overall knowledge score was 41.25%. Knowledge, in terms of diagnosis, was judged average with a score of 47.2%. Knowledge of etiologies and treatment was low (14.3% and 35.4% respectively). Few dentists refer patients to pain specialists for pain with no noticeable cause. Regarding students, the overall knowledge score was 39%. For diagnosis, the score was intermediate (42.6%) and poor for etiologies and treatment; 36.95%, 17.5% respectively. **Conclusion:** The current study revealed a low level of knowledge among dentists and dental students in the field of orofacial pain. This is at the origin of diagnostic wandering and sometimes invasive, costly and unnecessary interventions delaying appropriate management. University and postgraduate training on orofacial pain is necessary to ameliorate practitioners knowledge.

Key-words: Orofacial pain, Knowledge, Dental medicine students, Dentists, Neuralgia, Temporomandibular Disorders, Algeria.

Résumé

Introduction : Les dentistes sont les premiers professionnels de la santé confrontés aux patients souffrant de douleurs oro-faciales. Cette étude visait à évaluer le niveau de connaissances des médecins dentistes et des étudiants en médecine dentaire en matière de diagnostic et de traitement de la douleur orofaciale. **Méthodes :** Nous avons réalisé une étude transversale à l'aide de deux questionnaires en ligne distribués entre le 10 mai et le 10 juillet 2021. Nous avons inclus des étudiants en médecine dentaire et des dentistes exerçant dans n'importe quel établissement public ou privé en Algérie. Les données recueillies ont été codées et analysées sur le logiciel Excel. **Résultats :** Au total, 150 dentistes et 303 étudiants ont participé à l'étude. La majorité des dentistes ont signalé une fréquence plus élevée du dysfonctionnement de

l'articulation temporo-mandibulaire (30 %) par rapport aux autres douleurs oro-faciales. Le score global des connaissances des dentistes était de 41,25 %. La connaissance, en termes de diagnostic, a été jugée moyenne avec un score de 47,2 %. La connaissance des étiologies et du traitement était faible (respectivement 14,3 % et 35,4 %). Peu de dentistes orientent leurs patients vers des spécialistes de la douleur pour des douleurs sans cause apparente. En ce qui concerne les étudiants, le score global des connaissances était de 39 %. Pour le diagnostic, le score était intermédiaire (42,6 %) et mauvais pour les étiologies et le traitement ; 36,95 %, 17,5 % respectivement. **Conclusion** : La présente étude a révélé un faible niveau de connaissances chez les dentistes et les étudiants en médecine dentaire dans le domaine de la douleur orofaciale. Ceci est à l'origine d'une errance diagnostique et d'interventions parfois invasives, coûteuses et inutiles retardant la prise en charge appropriée. Une formation universitaire et postdoctorale sur la douleur orofaciale est nécessaire pour améliorer le niveau de connaissances des praticiens.

Mots clés :

Douleurs oro-faciales, connaissances, étudiants en médecine dentaire, dentistes, névralgies, dysfonctionnement de l'appareil manducateur, Algérie.

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1. Introduction

Pain is defined by the International Association for the Study of Pain (IASP) as "*an unpleasant sensory and emotional experience associated with or described in terms of actual or potential tissue damage*" (1).

Orofacial pain (OFP) is pain that is circumscribed or referred to oral, perioral, or facial anatomical structures of local, regional, or systemic causes, or related to central nervous system dysfunction (1). OFP is frequent, with a prevalence varying between 1 and 48% with an average of 13% depending on the definition used (2). In an epidemiological study carried out by Aggarwal et al., the prevalence of chronic OFP was estimated at 7% in patients aged 18 to 75 years (3). This type of pain constitutes the first reason for consultation in dental clinics, reaching 53.8% (4). Thus, dentists are generally the first health professionals receiving patients suffering from OFP (5). Hence, it is important to have a good knowledge of different OFP semiology in order to categorize them aiming to suggest the appropriate treatment for each type of pain. Indeed, studies have shown that chronic OFP may be misdiagnosed as dental pain and may lead to unnecessary and abusive extractions (6,7). In a study by Garvan et al. in Zurich, 73% of patients with a history of trigeminal neuralgia had previously visited a dentist, and 67 of them (48%) underwent dental extractions with an average of 10 teeth extracted; twelve patients had all 32 teeth removed (8). Despite these findings, very few studies have been conducted to assess the knowledge of dentists and dental students regarding OFP and most of them have stressed the importance of providing continuing education in this area (9,10). In Algeria, to the best of the authors' knowledge, no studies assessing the knowledge of dental practitioners or dental students

on OFP have been published yet. This prompted us to conduct a descriptive study aiming to assess the level of knowledge of dentists and dental students about OFP in Algeria.

2. Participants and Methods

This is a cross-sectional, descriptive observational study conducted online from May 10 to July 10, 2021. The study population was selected from dental students between the fourth and sixth year, affiliated to one of the nine Algerian medical schools providing university training in dentistry. We also included dentists practicing in any Algerian public or private institution. Students from the first to the third year were not included because courses in OFP are only taught from the fourth year.

The survey was carried out by means of two questionnaires designed on Google Forms, one intended for students (https://docs.google.com/forms/d/e/1FAIpQLSc4tca_dbh70UhqskGjZIJwmEMdet2xc0aaceOuxvy4BSws-mQ/viewform?usp=pp_url) and the other for practitioners (https://docs.google.com/forms/d/e/1FAIpQLScEeJnJNo5MvkkqnV5NFqsTmX0OicECjD93tegiSCxHgQ5ZfQ/viewform?usp=pp_url).

The questionnaires were submitted via email and shared via social media (Facebook, Instagram, LinkedIn, etc.).

The student questionnaire had three main sections:

- The first was dedicated to demographic data (age, gender, year of study, faculty);
- The second consisted of 15 questions assessing the clinical presentation/diagnosis of the

different OFP, their etiologies, and therapeutic management. The score was considered poor when the rate of correct answers was less than 40%, intermediate between 40 and 70% and excellent when it was greater than 70%.

- The final section included self-assessment questions on a scale of 0 to 5, ranging from "not at all" to "very good."

The dental practitioner questionnaire included an additional section assessing the frequency of OFP in consultation and interdisciplinary collaboration.

The collected data was coded and entered into Excel software. Descriptive analysis was performed using means and standard deviations for quantitative variables and percentages for qualitative variables.

3. Results

3.1 Dentists' Knowledge

3.1.1. Description of the study population

A total of 150 dentists completed the online questionnaire of which 98 women and 52 men (sex ratio F/M = 1.88). Survey participants graduated as dentists between 1976 and 2020, with a maximum percentage of 22.7% for 2020 graduates. Half of the participants were practicing in public hospitals. We received responses from dentists practicing in sixteen different Algerian cities. Oran was at the top with 37.3% of participants, followed by Chlef (8%), then Algiers (6.7%).

3.1.2. Frequency of facial pain in consultation

Most practitioners (41%) estimated that 50 to 75% of their patients present in consultation for an OFP as the main symptom.

Nearly a third (30%) estimated the frequency of temporomandibular disorders (TMD) to be between 10 and 30%. The other orofacial pain syndromes (Trigeminal Neuralgia, Persistent Idiopathic Facial Pain, Atypical Odontalgia, Burning Mouth Syndrome) were estimated to be less than 5% each by the majority of dentists.

3.1.3. Use of analgesics

Regarding prescription patterns, by far the most prescribed analgesic was Paracetamol (80%), followed by Paracetamol-Codeine (10.7%). These drugs were primarily prescribed further dental extractions (65.3%) but also for trigeminal neuralgia (7.3%).

3.1.4. Management strategies for non-dental orofacial pain

Most dentists (38.3%) prescribed analgesics, 30 (14%) referred patients to another pain specialist, 24 (11.2%)

made occlusal splints, 10.2% proposed dental restoration, 22 (10.2%) asked for further examinations, 15 (9.8%) proceeded to periodontal treatment and 5 (2.3%) preferred dental extraction.

3.1.5. Interdisciplinary collaboration

Most practitioners (70.1%) referred patients to specialists in oral pathology and surgery and almost half referred patients to ear, nose and throat (ENT) physicians. When 38.8% sought advice from neurologists. Only 2% reported that they do not refer their patients to any specialist.

3.1.6. Knowledge of the clinical semiology and specific treatment of each OFP syndrome

In overall analysis, 48% had a poor score, 47.33% had an intermediate score and only 4.67% had an excellent score. In analysis by skill, the level of knowledge was intermediate (47.2%) for clinical diagnosis and poor for etiology and treatment (14.3% and 35.4% respectively).

3.1.7. Self-assessment of knowledge and need for continuing medical education

The majority of dentists (61.7%) assigned themselves a score of less than or equal to 3/5 and 11 (7.4%) admitted having no knowledge to make the diagnosis (Figure 1).

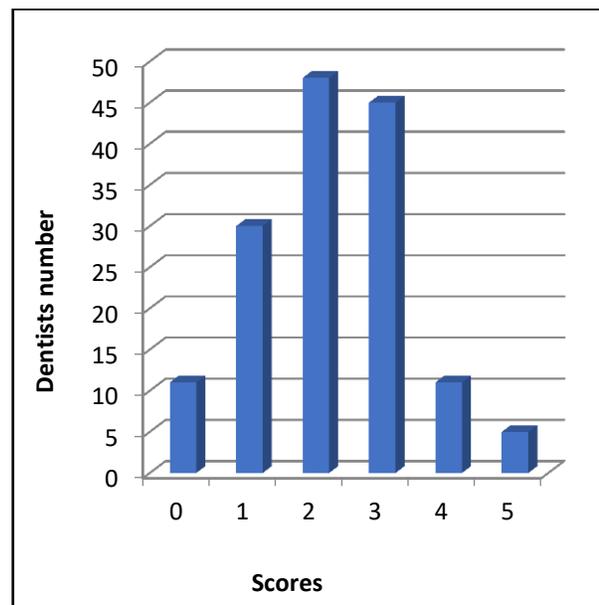


Figure 1: Dentists' self-assessment of their ability to diagnose orofacial pain

When asked about their ability to effectively treat patients with OFP, 137 dentists (91.3%) assigned themselves a score of 3/5 or less (Figure 2). In addition, 132 dentists (87.9%) expressed the need for

postgraduate training in the treatment of OFP to improve their knowledge levels.

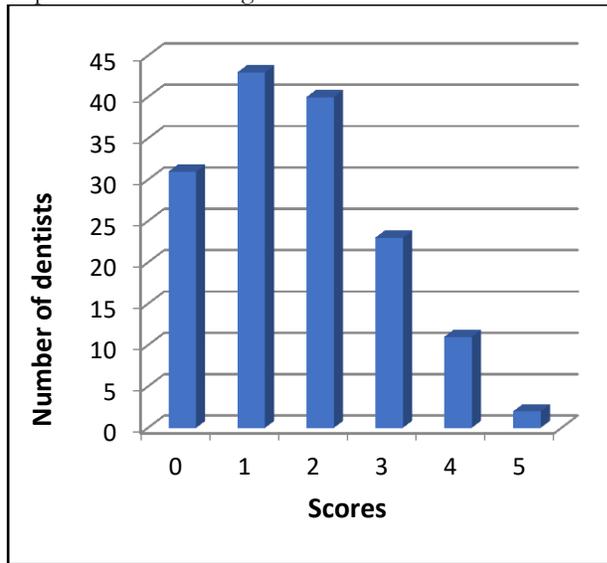


Figure 2: Dentists' self-assessment of their ability to treat orofacial pain

3.2 Knowledge of dental students

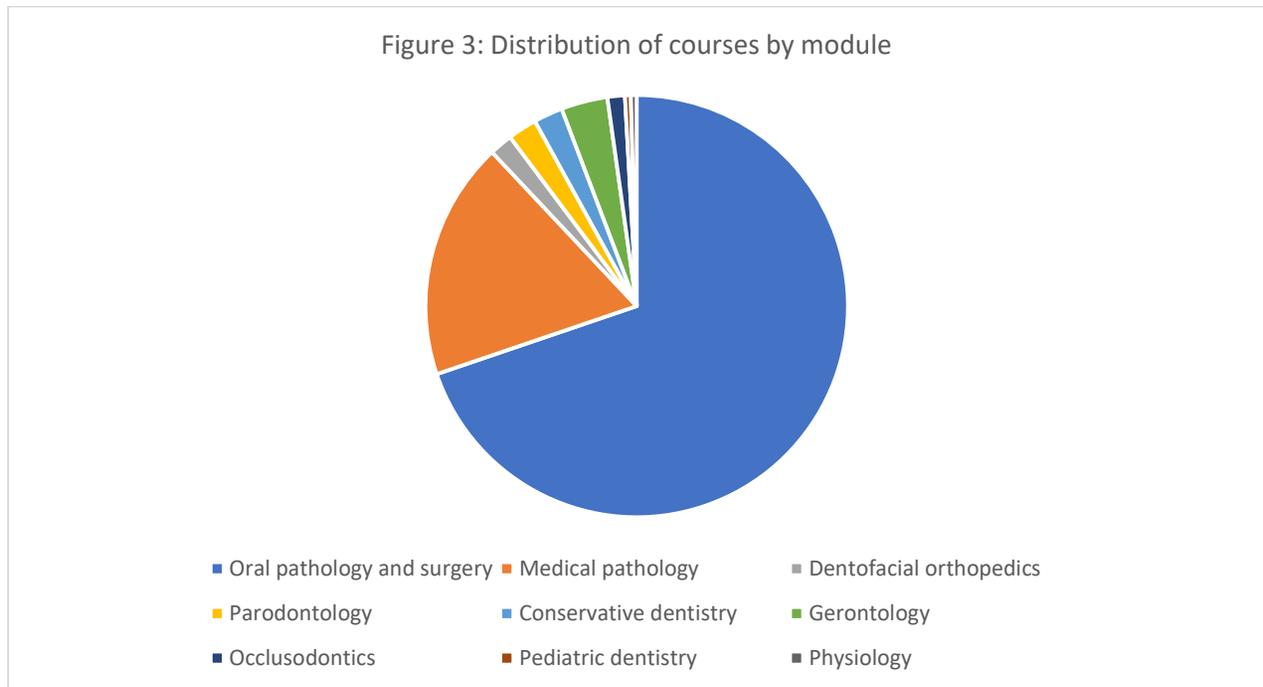
3.2.1. Description of the study population

A total of 303 dental students affiliated to nine medical schools across the country responded to our questionnaire. They were fourth year (85/28%), fifth year (103/34%) and sixth year (115/38%) students. The average age was 23.35 years with extremes ranging from 20 to 39 years. There was a clear female predominance with a sex ratio F/H=3.59. Most students (70%) reported attending at least one course on the diagnosis and treatment of OFP during their studies. These courses were provided as part of the oral pathology and surgery module in most cases (68.9%) (**Figure 3**).

3.2.2. Knowledge of clinical semiology and specific treatment

In overall analysis, 174 (57.43%) had a poor score, 125 (41.25%) had an average score and only 4 (1.32%) had an excellent score. In analysis by skill, the average score was 42.6% for clinical diagnosis, 17.5% for etiology and 36.95% for treatment.

Figure 3: Distribution of courses by module



3.2.3. Self-assessment of knowledge and need for continuing education

For OFP diagnosis, 198 students (65.4%) attributed themselves a score of 3/5 or less and only six (6) students (2%) attributed themselves a score of 4/5. For the ability to effectively treat patients with OFP, 77 students (25.4%) assigned themselves a score of 0/5

and 101 (33.3%) assigned themselves a score of 1/5 (**Figure 4**).

Furthermore, 283 students (93%) expressed the need for additional courses and training on the diagnosis and treatment of OFP.

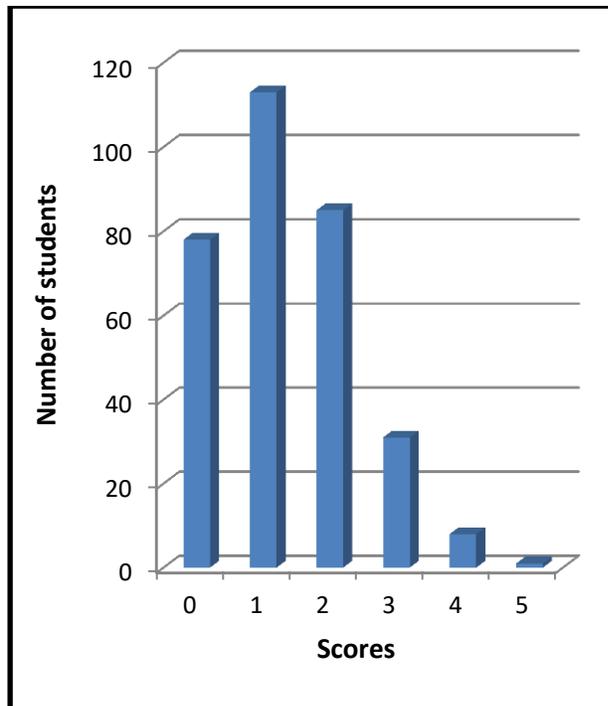


Figure 4: Students' self-assessment of orofacial pain treatment

4. Discussion

4.1. Discussion of the dentists' results

Our study included 150 dentists, most of whom were under the age of 30. This predominance of young subjects could be explained by the nature of our survey. Indeed, given the Covid-19 pandemic that has been raging in Algeria since March 2020, we opted for an online questionnaire (Google Forms), submitted by email and disseminated on social networks such as Facebook, Viber, and Instagram, known to be more visited by young people.

The prevalence of OFP varies among studies between 1% and 48% with an average of 13% (2). In a study that included 2299 general practitioners, Aggarwal et al., reported a frequency of 7% (3). In our study, nearly half of the practitioners (41%) estimated that 50-75% of their patients presented for consultation with pain as their main symptom. This supports our hypothesis that the dentist is the first health professionals to receive patients suffering from OFP.

Nearly one-third (30%) of our dentists estimated the frequency of temporomandibular disorders (TMD) ranged between 10 and 30%. The other OFP syndromes were estimated to be less than 5% each by the majority of dentists. This could be explained by the practitioners' good knowledge of TMD, allowing them to make the diagnosis more easily than other OFP

syndromes, especially neuralgia, which can be mistaken for dental pain. Indeed, during the dental curriculum, TMD is taught in the various dental specialties and modules compared to other OFP entities, which could explain the mastery of the semiology of this entity. Our results agree with those of a German study that included 533 dentists, when authors reported a higher frequency of TMD (14.1%) compared to the other syndromes that were estimated to represent less than 1% each (11).

Regarding the first-line therapeutic strategy for OFP without an obvious dental cause, more than half of our practitioners (55%) opted for prescribing analgesics and only 14% referred patients to a pain specialist. These results are identical to those of the German study, which showed that a non-dental origin is often not considered, as the strategy adopted by most dentists is the use of occlusal splints. The likelihood of referral to a specialist remains reduced (11).

When asked about the use of analgesics, paracetamol was the most commonly used molecule (80%), followed by codeine paracetamol (16%) and non-steroidal anti-inflammatory drugs (13%). Paradoxically, German dentists tend to use ibuprofen (87%) (11). This difference could be explained by the affordable cost of paracetamol in Algeria and therefore its accessibility, and by the caution of dentists towards the use of anti-inflammatory drugs given their side effects and drug interactions.

In our study, analgesics were prescribed mainly after dental extraction (65.3%) but also in case of facial neuralgia (7.3%). German dentists also prescribed these drugs after tooth extraction (71%) and in case of trigeminal neuralgia (10%), which confirms the low level of knowledge of dentists in the treatment of neuralgia (11).

The present study highlighted an overall knowledge score of 41.25%. Analysis by skill showed an intermediate score for clinical diagnosis, and low for etiology and therapeutic management. Our results are comparable to a Saudi study conducted by Al-Khotani et al., who showed that the knowledge level of Saudi and Swedish dentists was low (10). Another study carried out on general dentists in Kermanshah, Iran (12) showed that half of the dentists included had acceptable knowledge of diagnosis but very low knowledge of treatment (12). On the other hand, in an Australian investigation, the authors described an intermediate level in 48% of dentists (13).

Concerning self-assessment, 61.7% assigned themselves a score of less than or equal to 3/5 for diagnosis and 137 (91.3%) attributed themselves a score of less than or equal to 3/5 for treatment. This explains the results

obtained in the quiz, in particular the treatment part, which was judged to be poor. In addition, the majority of the dentists (87.9%) expressed the need for postgraduate training in the management of OFP.

4.2. Discussion of student results

Our study included 303 dental students from the 4th to the 6th year. The average age was 23 years with a female predominance. This predominance is due to the significant number of females compared with males in the medical sciences faculties in Algeria and particularly in the dental departments.

The overall score obtained by all the students who participated in the study was poor (39.12%). When analyzed by competency, the level of knowledge was intermediate for clinical diagnosis and poor for etiology (17.5%) and treatment (36.95%).

In a study including 128 dental students, Borromeo et al., showed that 47% of fourth-year students and 58% of fifth-year students had an intermediate level of knowledge (13). An assessment of dental schools in Brazil showed that academic training in chronic OFP is insufficient, not comprehensive, and very limited (14). The majority (70%) of students in our sample attended at least one course on OFP, particularly in the oral pathology and surgery module. OFP teaching appears to vary considerably between faculties. Some faculties are offering only a few hours of theoretical instruction on OFP, whereas others offer not only preclinical courses but also clinical activities where students evaluate patients with OFP under supervision (15-17). The latter have been shown to be more adept at diagnosing and managing simple cases of OFP and recognizing complex cases for referral to more thoroughly trained health professionals (18,19).

Regarding self-assessment, the majority of students attributed themselves poor scores for diagnosis and treatment (64.1% and 86.8% respectively). Students in Hamburg also reported feeling incompetent in diagnosing and treating nondental OFP (11). Moreover, almost all students in our studied group (93%) expressed a need for additional training on the diagnosis and treatment of OFP.

5. Limitations of the study

Some limitations of our study must be emphasized. On the one hand, the health crisis caused by the Covid-19 pandemic limited our move to clinics and dental offices in order to reach a larger number of dentists. This forced us to conduct our survey exclusively online with the dentists and the students. The students were busy preparing for their second semester exams during the period of our study, so the response rates did not reach

the expected level. In addition, the absence of Algerian or Maghrebian studies similar to ours made it difficult to compare our results.

6. Conclusion

Our study revealed a low level of knowledge among dentists and dental students in the field of OFP. This is the cause of diagnostic erraticity and of sometimes invasive, costly and unnecessary interventions delaying appropriate management. University and post-graduate training on OFP is necessary to improve the practitioners knowledge. Pain in the orofacial region is not exclusively odontogenic, hence the need for close collaboration between dentists, neurologists, ENT specialists and other pain specialists.

Episodic or ongoing neuropathic pain may present with symptoms that mimic odontogenic pain, but may require medical or surgical intervention rather than routine dental intervention.

Dentists should enhance their understanding of neuropathic processes to avoid inappropriate treatment and unnecessary tooth extractions.

Conflict of Interest

The authors declare that they have no conflict of interest.

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Ethical approval

Ethical approval was not required.

Informed consent

This article does not contain any studies involving human subjects.

Authors contributions

A. Chentouf: *Conceptualization, Methodology, Supervision, Writing original draft.* W. Bouhrara: *Supervision, Writing original draft.* M. Djamaa: *Investigation, Writing original draft.* F. Bekkara: *Investigation, Writing original draft.* Wajfa BOUDOUMI: *Investigation, Writing original draft.* Fadhila TOLOHI: *Investigation, Writing original draft.* S. Benaouf: *Supervision, Writing- Reviewing and Editing.* C.F. Tabeti-Bentabar: *Supervision, Writing- Reviewing and Editing.*

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References

- [1] Raja SN, Carr DB, Cohen M, Finnerup NB, Flor H, Gibson S, et al. The revised International Association for the Study of Pain definition of pain: concepts, challenges, and compromises. *Pain*. 2020;161(9):1976-82.
- [2] Macfarlane T, Glenny A, Worthington H. Systematic review of population-based epidemiological studies of oro-facial pain. *Journal of dentistry*. 2001;29(7):451-67.
- [3] Aggarwal VR, McBeth J, Zakrzewska JM, Lunt M, Macfarlane GJ. The epidemiology of chronic syndromes that are frequently unexplained: do they have common associated factors? *International journal of epidemiology*. 2006;35(2):468-76.
- [4] Tomoyasu Y, Higuchi H, Mori M, Takaya K, Honda Y, Yamane A, et al. Chronic orofacial pain in dental patients: retrospective investigation over 12 years. *Acta Med Okayama*. 2014;68(5):269-75.
- [5] Zakrzewska JM. Differential diagnosis of facial pain and guidelines for management. *Br J Anaesth*. 2013;111(1):95-104.
- [6] Von Eckardstein KL, Keil M, Rohde V. Unnecessary dental procedures as a consequence of trigeminal neuralgia. *Neurosurg Rev*. 2015;38(2):355-60.
- [7] Law AS, Lilly JP. Trigeminal neuralgia mimicking odontogenic pain. A report of two cases. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 1995;80(1):96-100.
- [8] Garvan NJ, Siegfried J. Trigeminal neuralgia-earlier referral for surgery. *Postgrad Med J*. 1983;59(693):435-7.
- [9] Aggarwal VR, Joughin A, Zakrzewska JM, Crawford FJ, Tickle M. Dentists' and specialists' knowledge of chronic orofacial pain: results from a continuing professional development survey. *Prim Dent Care*. 2011;18(1):41-4.
- [10] Al-Khotani A, Naimi-Akbar A, Björnsson O, Christidis N, Alstergren P. Professional knowledge among Swedish and Saudi healthcare practitioners regarding oro-facial pain in children and adolescents. *J Oral Rehabil*. 2016;43(1):1-9.
- [11] Ziegeler C, Wasiljeff K, May A. Nondental orofacial pain in dental practices - diagnosis, therapy and self-assessment of German dentists and dental students. *Eur J Pain*. 2019;23(1):66-71.
- [12] Rezaei F, Sharifi R, Shahrezaee HR, Mozaffari HR. Knowledge About Chronic Orofacial Pain Among General Dentists of Kermanshah, Iran. *Open Dent J*. 2017;11:221-9.
- [13] Borromeo GL, Trinca J. Understanding of basic concepts of orofacial pain among dental students and a cohort of general dentists. *Pain Med*. 2012;13(5):631-9.
- [14] Simm W, Guimaraes AS. The teaching of temporomandibular disorders and orofacial pain at undergraduate level in Brazilian dental schools. *J Appl Oral Sci*. 2013;21(6):518-24.
- [15] Durham J, Aggarwal V, Davies SJ, Harrison SD, Jagger RG, Leeson R et al. Temporomandibular Disorders (TMDs): an update and management guidance for primary care from the UK Specialist Interest Group in Orofacial Pain and TMDs (USOT). Royal College of Surgeons of England: Royal College of Surgeons of England, 2013. 22 p. (Clinical Standard Series).
- [16] Klasser GD, Greene CS. Predoctoral teaching of temporomandibular disorders: a survey of U.S. and Canadian dental schools. *J Am Dent Assoc*. 2007;138(2):231-7.
- [17] Sharma S, Breckons M, Brönnimann Lambelet B, Chung JW, List T, Lobbezoo F, et al. Challenges in the clinical implementation of a biopsychosocial model for assessment and management of orofacial pain. *J Oral Rehabil*. 2020;47(1):87-100.
- [18] Gonzalez YM, Mohl ND. Care of patients with temporomandibular disorders: an educational challenge. *J Orofac Pain*. 2002;16(3):200-6.
- [19] Costa YM, De Koninck BP, Elsaraj SM, Exposto FG, Herrero Babiloni A, Kapos FP, et al. Orofacial pain education in dentistry: A path to improving patient care and reducing the population burden of chronic pain. *J Dent Educ*. 2021;85(3):349-58.