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ORIGINAL ARTICLE

Validation and internal consistency of a questionnaire to assess dental surgeons' knowledge about temporomandibular disorders

Validação e consistência interna de um questionário para avaliar o conhecimento de cirurgiões-dentistas sobre a disfunção temporomandibular

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ABSTRACT

BACKGROUND AND OBJECTIVES: Temporomandibular Disorder (TMD), despite being an increasingly common condition, is still a complex topic for many dentists. This study aims to validate and verify the internal consistency of an instrument developed to assess the knowledge of dentists on the main issues related to TMD. **METHODS:** This is research divided into three stages: observational, transversal and quantitative. Initially, a total of 10 expert/judges dental surgeons (DS) in the area of TMD and orofacial pain were invited to participate to evaluate the form and content of the instrument. In the second stage, a total of 5 DS who were also specialists validated the answers considered correct. In the third stage, internal consistency was checked in a sample of 188 DS who responded to the same questionnaire on two occasions to compare and calculate internal consistency. **RESULTS:** In the first stage of validation, the individual and total CVI was 1, suggesting the consistency of the instrument. In the experts' assessment, cohesion was found in the structure of the instrument, which presented a total Cronbach's alpha of 0.766, that is, substantial consistency, with the first domain, on pain and behavior, the greatest consistency with α of 0.815. The internal consistency of the instrument carried out by 188 dental surgeons showed almost perfect consistency (α of 0.820). **CONCLUSION:** The general consistency of the instrument developed to assess knowledge about TMD was considered substantial. When internal consistency was verified in a sample of dental surgeons, it varied from moderate to almost perfect.

KEYWORDS: Dental surgeon, Instruments, Knowledge, Validation, Temporomandibular dysfunction

RESUMO

JUSTIFICATIVA E OBJETIVOS: A disfunção temporomandibular (DTM), apesar de ser uma condição cada vez mais frequente, ainda é um tema complexo para muitos cirurgiões-dentistas (CD). Este estudo teve como objetivo validar e verificar a consistência interna de um instrumento desenvolvido para avaliar o conhecimento dos CD sobre os principais assuntos relacionados à DTM. **MÉTODOS:** Trata-se de uma pesquisa dividida em três etapas, do tipo observacional, transversal e quantitativa. Inicialmente, foram convidados a participar um total de 10 CD especialistas/juízes na área de DTM e dor orofacial para avaliar a forma e o conteúdo do instrumento. Na segunda etapa, um total de 5 CD também especialistas validaram as respostas consideradas corretas. Na terceira etapa, a consistência interna foi verificada em uma amostra de 188 CD que responderam ao mesmo questionário em duas ocasiões para comparar e calcular a consistência interna. **RESULTADOS:** Na primeira etapa da validação, o IVC individual e total foi 1, sugerindo a consistência do instrumento. Na avaliação dos especialistas, encontrou-se uma coesão na estrutura do instrumento que apresentou um alfa de *Cronbach* total de 0,766, ou seja, uma consistência substancial, tendo o primeiro domínio, sobre dor e comportamento, a maior consistência com α de 0,815. A consistência interna do instrumento realizada por 188 cirurgiões-dentistas apresentou consistência interna quase perfeita (α de 0,820). **CONCLUSÃO:** A consistência geral do instrumento desenvolvido para avaliação do conhecimento sobre DTM foi considerada substancial. Quando a consistência interna foi verificada em uma amostra de cirurgiões-dentistas, a mesma variou de moderada a quase perfeita.

DESCRITORES: Cirurgião-dentista, Conhecimento, Disfunção temporomandibular, Instrumentos, Validação.

HIGHLIGHTS

Validated instrument shows substantial consistency in assessing dental surgeons' knowledge of TMD

The study reveals high levels of content validity and reliability in TMD questionnaire

The domain of pain and behavioral aspects showed the highest internal consistency, standing out among the evaluated topics

INTRODUCTION

Temporomandibular disorder (TMD) is characterized as a group of pathological conditions of the musculoskeletal and neuromuscular systems that involve the temporomandibular joints (TMJ), masticatory muscles and adjacent tissues, a definition established according to the American Academy of Orofacial Pain[1].

Currently, evidence indicates that TMD is the main cause of orofacial pain that does not have dental origin and has a multifactorial etiology, involving a set of factors that can encompass muscular, skeletal, psychological, cultural, pathophysiological and social etiologies, thus being a complex condition, with no single treatment capable of acting on all the causes associated with the presence of the dysfunction[1-3].

Thus, as it is characterized as a complex condition, finding appropriate and unique solutions remains a challenge, both for patients, who suffer from the disease, and for clinicians, who receive these patients in their offices, searching for help regarding this condition, and this is impacted by knowledge about the condition[1,2,4,5].

During graduation dental courses, many dental schools have classes on TMD and/or occlusion in their curriculum, as the graduate needs to be knowledgeable about these topics, even in a general way. To date, the topic of TMD/Orofacial pain is not a mandatory topic in the syllabus of Dentistry teaching institutions, highlighting that this topic, when neglected, can lead to a lack of preparation of the dental surgeon to diagnose, treat or guide individuals with these disorders[5-7].

The consequence of this is that despite the fact that TMDs are an increasingly common condition and patient complaint, many dentists do not have the basic knowledge to manage them[5]. This occurs because many general dentists misdiagnose orofacial pain that affects the TMJ, confusing it with orofacial pain of dental origin, which results in incorrect patient management[8]. This is due to the lack of curricular workload on this condition, making the professional's knowledge limited for correct management and requiring a need for instruments that measure this knowledge[4,5].

Thus, the assessment of dental surgeons' knowledge about TMD has been a much discussed topic in the dental community, and the basis since the graduation period is necessary due to the many controversies that the topic addressed brings, thus, a dentistry based on evidence is necessary for professionals to be well guided in their clinical practice[6].

Instruments for assessing TMD knowledge have been highlighted in the literature. In the 1990s, reference authors[9] were precursors of a questionnaire for this purpose in the United States, which was adapted over the years in Europe[7,10-13]. This also occurred on other continents, such as Asia[4,5,14].

Validating developed instruments is essential, where the approval of questionnaires and scales in the health area can be considered a primordial step to confirm the accuracy of the instrument, the coherence of its items, criteria and content. Thus, evaluating the instruments fulfills the purpose, that is, they measure what they aim to, and evaluate what they propose[15,16].

Under these circumstances, the probability of error can be reduced, ensuring better decision-making for the treatment to be instituted. In this sense, given the lack of instruments that address the different aspects of TMD in the Portuguese language, the present study's objective was to validate a questionnaire developed to assess knowledge of TMD through experts and verify its reliability, in order to be a tool that helps measure knowledge on the topic of dental surgeons (DS) in general.

METHODS

This is an observational, cross-sectional and quantitative research. The procedures that were carried out in this study respected the guidelines and standards that regulate research involving human beings, being approved under opinion No 6062697 by the research Ethics Committee of São Leopoldo Mandic, Campinas, SP, Brazil.

Development of the questionnaire

For this purpose, a questionnaire with 15 items was developed to assess the knowledge of dentists about TMD in four specific areas: chronic pain and behavioral pain (3 statements), etiology (4 statements), diagnosis and classification (4 statements) and control and prognosis (4 statements), totaling 15 statements rated on a 5-point Likert scale (strongly agree, agree, neutral, disagree and strongly disagree). Each domain of the questionnaire was based on the current scientific literature and questionnaires developed in other countries on the past[5,7,9,12,13,17,18].

First step of the research

Initially, a total of 10 DS who are experts/judges in the area of TMD and orofacial pain, whether experts, masters or doctors, were invited to participate. This number is the maximum suggested for this type of study, which indicates a need for a minimum of 5 and a maximum of 10 participants[19]. The research was carried out using an electronic form where the related questions were found. Therefore, postgraduate studies in the area were considered as an inclusion criterion, regardless of sex and length of training. As exclusion criteria, dentists who were retired or clinically inactive for some other reason are mentioned. After reading the Informed Consent Form and agreeing to participate, they were invited to respond to content validation.

They then evaluated the developed questionnaire, which had 15 questions about dentists' knowledge of TMD in four specific areas: chronic pain and behavioral pain (3 statements), etiology (4 statements), diagnosis and classification (4 statements) and control and prognosis (4 statements), totaling 15 statements. Each statement had a Likert scale in the responses (strongly agree, agree, neutral, disagree and strongly disagree).

For this content validation, the Health Educational Content Validation Instrument was used, where the content as a whole needs to present a Content Validity Index (CVI) greater than or equal to 0.8. The CVI measures the proportion of judges in agreement on a certain aspect of the instrument. It is composed of three domains: Objectives (purposes, goals or purposes); Structure/Presentation (organization, structure, strategy, coherence and sufficiency); Relevance (significance, impact, motivation and interest).

To achieve the result, two calculations were carried out: calculation of each item and calculation of the total CVI. In case of a calculation lower than 0.8, the questionnaire should be adapted and sent back to the same judges/experts until reaching the minimum of 0.8. Below is the CVI calculation formula:

$$CVI = \frac{\text{Number of responses 4 or 5 on the Likert scale}}{\text{Total number of responses}}$$

Second stage of the research

A total of 5 DS, experts/judges in the area of TMD and orofacial pain, after signing the informed consent form, evaluated the technical content of the questionnaire. For this content validation, in order to verify the reproducibility of agreement of responses, the Cronbach coefficient was considered. The response with the greatest consensus among experts was used as the gold standard for future use of the questionnaire in populations.

Third stage of the research

After validating the questionnaire, DS with active registration at the Regional Dental Councils in Brazil were invited to participate in the internal consistency of the questionnaire and after signing the informed consent form they were included in the study.

The sample calculation was carried out based on a previous reference study[11]. The confidence interval adopted was 95% and a standard error of 5%, with a total of 188 DS being calculated.

Participants of different specialties responded to the same questionnaire on two occasions, the second being 7 days after the first and thus the Cronbach's alpha coefficient of the responses could be calculated.

Statistical analysis

The data were tabulated in Microsoft Office Excel® software and exported to the GraphPad Prism 8.4 program for descriptive statistical analysis. For the first stage, the CVI index was used, for the second and third, the Cronbach coefficient.

RESULTS

Among the experts, 80% were female (n=4) and 20% were male (n=1), with ages ranging from 38 to 59 years old with a mean of 49.6 ± 9.0. The type of service that predominated was private and teaching (100%).

Regarding the validation of the instrument, in its form and content, the experts indicated a partial and total agreement of 100% in all items (Table 1).

Table 1. Data related to the experts' validation test.

	Items	Agreement					CVI
		Strongly Disagree *f*(%)	Disagree *f*(%)	Neutral *f*(%)	Agree *f*(%)	Strongly agree *f*(%)	
	Objectives						
1	Includes the proposed theme.	0	0	0	0	100	1
2	Suitable for the evaluation process	0	0	0	10	90	1
	Structure and presentation						
3	Language appropriate to the target audience.	0	0	0	10	90	1
4	Objective information	0	0	0	30	70	1
5	Required information	0	0	0	10	90	1
6	Logical sequence of ideas	0	0	0	10	90	1
7	Current theme	0	0	0	0	100	1
8	Appropriate text size	0	0	0	20	80	1
	Relevance						
9	Stimulates learning	0	0	0	10	90	1
10	Contributes to knowledge in the area	0	0	0	20	80	1
11	Arouses interest in the topic	0	0	0	20	80	1
	CVI total						1

f = absolute frequency; % = relative frequency; CVI = Content Validity Index per item.

When Cronbach's alpha was evaluated for the responses considered the gold standard for each item, the complete instrument showed substantial internal consistency (0.766). The instrument with 15 questions and 4 domains, as well as the Cronbach's alpha values separated by domain can be seen in Table 2. The chronic and behavioral pain domain presented the highest item consistency (0.815) and the etiology domain had the lowest (0.595).

About Table 3, when evaluated the internal consistency of the instrument carried out by 188 dental surgeons, the complete instrument showed substantial internal consistency (0.820). The Treatment and Prognosis stands out, presenting substantial consistency, the highest item consistency (0.789) among the domains, where all others showed moderate consistency.

The results of the intraclass correlation analysis indicate an ICC of 0.873 (95% CI: 0.837–0.903), demonstrating substantial agreement when considering the mean of the evaluations, with the result being statistically significant ($p < 0.001$). The power of the test was calculated using the G*Power software, indicating a test power of 0.93.

DISCUSSION

The present study sought to validate the form, content and responses, through experts in the area of temporomandibular disorder and orofacial pain, of a questionnaire developed to assess the knowledge of DS about TMD. The number of experts is in line with what was suggested by reference studies[16,20] who indicate that the content evaluation must be carried out by a committee composed of five to ten judges who are experts in the area of the measuring instrument.

Instruments for assessing TMD knowledge have been highlighted in the literature. In the 90s, scientists in the United States9 were precursors of a questionnaire for this purpose, which was adapted over the years in Europe7,10-13. This also occurred on other continents, such as Asia[4,5,14].

The validation of questionnaires and scales in the health area as an essential step to verify the stability of the instrument, the cohesion of its items, criteria and content. Assessing whether the instruments fulfill their objective, that is, whether they measure what they propose, and evaluate what they intend, is in accordance with reference studies[16,21]. The experts evaluated the questionnaire developed with 15 questions about TMD in four specific areas: chronic pain and behavioral pain, etiology, diagnosis and classification, and control and prognosis. For this content validation, the Health Educational Content Validation Instrument was used, where the content as a whole needs to present a Content Validity Index (CVI) greater than or equal to 0.8[22]. Each statement had a Likert scale in the responses, as also carried out by previous research[5,9-11,14,23].

Table 2. Instrument used in the analysis.

		PREDOMINANT RESPONSE	CRONBACH'S ALPHA
	COMPLETE INSTRUMENT		0.766 Substantial consistency
	CHRONIC PAIN AND BEHAVIORAL PAIN		0.815 Almost perfect consistency
1	Chronic pain is somatic in a behavioral and social problem	Strongly agree	
2	Sleep disturbances are common in patients with chronic orofacial pain	Agree	
3	Depression may be an important etiological factor in chronic orofacial pain	Strongly agree	
	ETIOLOGY		0.595 Moderate consistency
4	Oral parafunctional habits are significant in the development of TMD	Agree	
5	Stress is a very important factor in the development of TMD	Strongly agree	
6	Headache is commonly related to psychological or social factors	Agree	
7	Patients with rheumatoid arthritis should be asked about the appearance of TMJ symptoms	Strongly agree	
	DIAGNOSIS AND CLASSIFICATION		0.733 Substantial consistency
8	Pain in TMJ disorders is often associated with a clicking sound and/or restriction in the mouth opening	Strongly agree	
9	TMD pain is aggravated/relieved by jaw movements	Agree	
10	Reduced mouth opening capacity is almost never caused by TMJ arthritis	Agree	
11	Tenderness to palpation in the masticatory system and/or TMJ is the most important clinical sign of TMD	Agree	
	TREATMENT AND PROGNOSIS		0.70 Substantial consistency
12	Orthodontic treatment can treat TMD	Strongly disagree	
13	Anti-inflammatories are effective in treating acute arthralgias	Agree	
14	The use of occlusal splints is a good therapy for patients with TMD	Agree	
15	Counseling and behavioral therapy are the first line of treatment in patients with TMD	Strongly agree	

[a]The value is negative due to a negative mean covariance between items, which occurred due to negative inter-item correlations.

Table 3. Internal consistency of the instrument.

		CRONBACH'S ALPHA FOR EACH ITEM	FULL DOMAIN CRONBACH'S ALPHA
	COMPLETE INSTRUMENT		0.820 Almost perfect consistency
	CHRONIC PAIN AND BEHAVIORAL PAIN		0.540 Moderate consistency
1	Chronic pain is somatic in a behavioral and social problem	0.834	
2	Sleep disturbances are common in patients with chronic orofacial pain	0.827	
3	Depression may be an important etiological factor in chronic orofacial pain	0.822	
	ETIOLOGY		0.676 Substantial consistency
4	Oral parafunctional habits are significant in the development of TMD	0.815	
5	Stress is a very important factor in the development of TMD	0.817	
6	Headache is commonly related to psychological or social factors	0.807	
7	Patients with rheumatoid arthritis should be asked about the appearance of TMJ symptoms	0.807	
	DIAGNOSIS AND CLASSIFICATION		0.681 Substantial consistency
8	Pain in TMJ disorders is often associated with a clicking sound and/or restriction in the mouth opening	0.801	
9	TMD pain is aggravated/relieved by jaw movements	0.798	:
10	Reduced mouth opening capacity is almost never caused by TMJ arthritis	0.813	
11	Tenderness to palpation in the masticatory system and/or TMJ is the most important clinical sign of TMD	0.802	
	TREATMENT AND PROGNOSIS		0.789 Substantial consistency
12	Orthodontic treatment can treat TMD	0.810	
13	Anti-inflammatories are effective in treating acute arthralgias	0.795	
14	The use of occlusal splints is a good therapy for patients with TMD	0.797	
15	Counseling and behavioral therapy are the first line of treatment in patients with TMD	0.793	

In the experts' assessment, the results generally show convergence, suggesting cohesion in the structure of the instrument. In the results of the data related to the validation test in each item of the questionnaire, they were distributed as follows. Items 1 (objective) and 7 (structure and presentation) of the questionnaire reached 100% total agreement from the experts. Items 2 on the objective, items 3,5, 6 which evaluate the structure and presentation of the questionnaire and item 9 on relevance - reached 90% total agreement among the experts. Items 8, structure and presentation, 10 and 11 relevance - reached 80% total agreement, item 4 - 70% total agreement. Regarding the Likert scale, points 1, 2 (totally disagree and disagree) or 3 neutral (neither agree nor disagree) did not express the opinion of any experts, indicating high agreement among experts in relation to what the instrument proposes. In this sense, the experts' assessment reached an CVI of 1 in all items and in the total CVI.

In the present study, we sought to validate the questionnaire developed to assess the knowledge of dental surgeons about TMD, understanding that it will serve as support for other research, comparison in different cultures and application in different contexts. However, as important as validating was checking the internal consistency of the instrument to verify that it is achieving the proposed objective.

For this content validation, a group of 5 dental surgeons who were experts/judges in the area of TMD and Orofacial Pain were invited to participate, including specialists, masters and doctors. The experts evaluated all items in the domains of the developed questionnaire, and Cronbach's alpha was used for the answers.

It should be added that in the development of instruments, it must have a direct objective and it is normal to have strong and weaker aspects. The more accurate the answers, the better, so long and complex instruments can be a problem. In this questionnaire,

a shorter instrument was chosen, different from others in the literature with 37 items[5,10] and 20 items[7].

In the experts' assessment, cohesion was found in the structure of the instrument, which presented a Cronbach's alpha of 0.766, that is, substantial consistency. In the first domain of chronic and behavioral pain, agreement varied between 80% and 90%, where Cronbach's alpha was 0.815, indicating substantial consistency. This domain was the one that showed greater consistency, in line with what was observed in the instrument in a similar study[4], where the degree of agreement was higher in the chronic and behavioral pain domain, in a group of Swedish and Saudi Arabian dentists. In another study[23], the domain that had the most agreement also involved psychosomatic aspects.

In the second domain of etiology, agreement varied between 80% and 100%, with Cronbach's alpha of 0.595, indicating moderate consistency. A past study[4] also found a weak correlation in this domain. These results can be attributed to the multifactorial nature of etiology and the lack of standardization in academic curricula[5,7,12,13]. Consequently, professionals have heterogeneous training, tending to prioritize specific knowledge in their area of specialization. Thus, professionals with training focused on behavioral aspects tend to emphasize psychosomatic factors, while those with an emphasis on emotional or anatomical-functional aspects adopt approaches corresponding to their respective theoretical formation.

In the third domain on diagnosis and classification, agreement was more heterogeneous, ranging between 50% and 100%, with Cronbach's alpha of 0.733, indicating reasonable consistency. It is known that diagnosis is an item that can vary greatly according to the professional's knowledge. In some studies[5,10] was the item with the most disagreement among professionals, and in others[4,7] showed a weak correlation.

In the fourth domain, on treatment and prognosis, agreement also varied between 50% and 100%, with Cronbach's alpha of 0.70 indicating reasonable consistency. These findings are better than those pointed out by other authors[5,10], where the largest number of significant differences between the groups was found in the treatment and prognosis domain. In the same sense, reference authors[4,7] pointed out a weak correlation in the treatment item and weak prognosis.

Due to several divergences that the topic addressed brings, knowledge of evidence-based dentistry is necessary for the professional to be well guided in their graduation and in practical experience in the clinic. Under these circumstances, the probability of error can be reduced, ensuring the best decision choice for diagnosis and consequently the treatment to be instituted[24]. In the current work, we sought to validate the questionnaire proposed to assess the knowledge of dental surgeons about TMD, based on the assumption that such work will be useful and valid as support for other research, comparison in different cultures and applicability in various contexts.

CONCLUSION

In validating this instrument, a high level of agreement was found among experts, in terms of its form and content. The answers considered the gold standard by the experts showed internal consistency that ranged from reasonable to substantial.

When internal consistency was verified in a sample DS, it varied from moderate to substantial.

REFERENCES

1. Rota AC, Biato ECL, Macedo SB, Moraes ACR. Nas trincheiras da disfunção temporomandibular: estudo de vivências. Cien Saude Colet. 2021;26(9):4173-82. http://doi.org/10.1590/1413-81232021269.14592020. PMid:34586269.
2. Gauer RL, Semidey MJ. Diagnosis and treatment of temporomandibular disorders. Am Fam Physician. 2015;91(6):378-86. PMid:25822556.
3. Rhoden A, Braz MA, Brew MC, Cruz RA, Grossmann E, Bavaresco CS. Avaliação da ocorrência e dos conhecimentos sobre disfunção temporomandibular em profissionais da Equipe de Saúde da Família do Grupo Hospitalar Conceição. RFO-UPF. 2020;25(1):16-25. http://doi.org/10.5335/rfo.v25i1.10285.
4. Al-Khotani A, Naimi-Akbar A, Bjornsson 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. http://doi.org/10.1111/joor.12330. PMid:26134067.
5. Al-Huraishi HA, Meisha DE, Algheriri WA, Alasmari WF, Alsuhaim AS, Al-Khotani AA. Newly graduated dentists' knowledge of temporomandibular disorders compared to specialists in Saudi Arabia. BMC Oral Health. 2020;20(1):272. http://doi.org/10.1186/s12903-020-01259-4. PMid:33028397.
6. Araújo IRS, Silveira AS, Cardoso M, Tannure PN. Dentists' knowledge about the relationship between temporomandibular dysfunction and oclusal factors. Rev Odontol UNESP. 2019;48(1):e20190065.
7. Mozhdeh M, Caroccia F, Moscagiuri F, Festa F, D'Attilio M. Evaluation of knowledge among dentists on symptoms and treatments of temporomandibular disorders in Italy. Int J Environ Res Public Health. 2020;17(23):1-6. http://doi.org/10.3390/ijerph17238760. PMid:33255732.
8. Hadlaq EM, Khan H, Mubayrik AB, Almuflehi NS, Mawardi H. Dentists' knowledge of chronic orofacial pain. Niger J Clin Pract. 2019;22(10):1365-71. http://doi.org/10.4103/njcp.njcp_110_19. PMid:31607725.
9. Le Resche L, Truelove EL, Dworkin S. Temporomandibular disorders: a survey of dentists' knowledge and beliefs. J Am Dent Assoc. 1993;124(5):90-106. http://doi.org/10.14219/jada.archive.1993.0121. PMid:8482787.
10. Tegelberg A, Wenneberg B, List T. General practice dentists' knowledge of temporomandibular disorders in children and adolescents. Eur J Dent Educ. 2007;11(4):216-21. http://doi.org/10.1111/j.1600-0579.2007.00458.x. PMid:17935561.
11. Lindfors E, Tegelberg A, Magnusson T, Ernberg M. Treatment of temporomandibular disorders: knowledge, attitudes and clinical experience among general practising dentists in Sweden. Acta Odontol Scand. 2016;74(6):460-5. http://doi.org/10.1080/00016357.2016.1196295. PMid:27327618.
12. 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. http://doi.org/10.1002/ejp.1283. PMid:29978526.
13. Osiewicz M, Kojat P, Gut M, Kazibudzka Z, Pytko-Polonczyk J. Self-perceived dentists' knowledge of temporomandibular disorders in krakow: a pilot study. Pain Res Manag. 2020;2020:9531806. http://doi.org/10.1155/2020/9531806. PMid:32566064.
14. Lee WY, Choi JW, Lee JW. A study of dentists knowledge and beliefs regarding temporomandibular disorders in Korea. Cranio. 2000;18(2):142-6. http://doi.org/10.1080/08869634.2000.11746126. PMid:11202825.
15. Nora CRD, Zoboli E, Vieira MM. Validation by experts: importance in translating and adapting instruments. Rev Gaúcha Enferm. 2017;38(7):e64851.
16. Alexandre NMC, Coluci MZO. Validade de conteúdo nos processos de construção e adaptação de instrumentos de medidas. Cien Saude Colet. 2011;16(7):3061-8. http://doi.org/10.1590/S1413-81232011000800006. PMid:21808894.

17. Gnauck M, Magnusson T, Ekberg EC. Knowledge and competence in temporomandibular disorders among Swedish general dental practitioners and dental hygienists. Acta Odontol Scand. 2017;75(6):429-36. http://doi.org/10.1080/00016357.2017.1331373. PMid:28554268.

18. Sam P, Dhanraj M, Jain AR. Treatment of temporomandibular disorders-Knowledge, attitude, and practice among general practicing dentists: a survey. Drug Invention Today. 2018;10(5):707-10.

19. Lynn MR. Determination and quantification of content validity. Nurs Res. 1986;35(6):382-5. http://doi.org/10.1097/00006199-198611000-00017. PMid:3640358.

20. Coluci MZO, Alexandre NMC, Milani D. Construção de instrumentos de medida na área da saúde. Cien Saude Colet. 2015;20(3):925-36. http://doi.org/10.1590/1413-81232015203.04332013. PMid:25760132.

21. Nora CRD, Zoboli E, Vieira MM. Validação por peritos: importância na tradução e adaptação de instrumentos. Rev Gaúcha Enferm. 2017;38(7):1-9.

22. Lobiondo-Wood G, Haber J. Desenhos não-experimentais. Pesquisa em Enfermagem. 2001;4:110-21.

23. Glaros A, Glass EG, McLaughlin L. Knowledge and beliefs of dentists regarding temporomandibular disorders and chronic pain. J Orofac Pain. 1994;8(2):216-22. PMid:7920357.

24. Goddard G, Mauro G. Temporomandibular disorders, a review of current diagnosis and treatment. Dent Cadmos. 2018;86(5):364-75. http://doi.org/10.19256/d.cadmos.05.2018.04.

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