



Validity and Reliability of the Persian Translation of the Diagnostic Criteria for Temporomandibular Disorders Questionnaire

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Abstract

Background: The Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) Questionnaire is a validated instrument extensively used to diagnose TMD.

Objectives: This study aimed to determine the reliability and validity of the Persian translation of the DC/TMD.

Methods: A team of specialists assessed the questionnaire's final version for content and form validity after translation. A questionnaire was given to 150 students at the Kermanshah Faculty of Dentistry. The convergent validity was assessed by determining the connection between item scores and computing Cronbach's alpha coefficient. The test-retest reliability was evaluated by comparing the results obtained in two phases using the correlation and intraclass correlation coefficients of 30 students from the Faculty of Dentistry.

Results: The ICC coefficient of the Persian DC/TMD questionnaire was 0.98. The questionnaire's overall Kaiser-Meyer-Olkin (KMO) measure was 0.62, suggesting that the questions were acceptable. The Bartlett's test was significant ($P < 0.0001$). The internal consistency of each question was strong, with a Cronbach's alpha rating of 0.90 or above. The content validity index (CVI) indicated an appropriate degree of content validity, which was 0.95.

Conclusions: The Persian version of the questionnaire can be utilized in clinical settings to diagnose and assess TMD among Persian speaking populations.

Keywords: Temporomandibular Joint Disorders, Diagnosis, Persian Translation Validation, Temporomandibular Joint Dysfunction Syndrome

1. Background

Temporomandibular joints, rodent muscles, and other tissues are involved in a complex clinical problem called temporomandibular joint disorders (TMD). The temporomandibular joint disorder is a painful oral and facial disease that causes clicking joints, muscle spasms, and discomfort around the temporomandibular joint, in addition to psychological stress, occlusal interference, oral parafunction, dysfunction of the masticatory muscles and surrounding tissues, degenerative joint disorders, or a combination of these for various reasons (1-3). There are no accurate statistics on the prevalence of these disorders in Iran, and rates reported vary from 18.7 to 51.5% of the country's population (4-6). In the absence of proper diagnosis and treatment, disorders of this joint can cause

chronic pain, reduced working days, health care costs, and social and psychological effects (7). Recent research has also shown that TMD symptoms, especially pain, can exacerbate physical and mental damage and have a devastating impact on quality of life (8, 9). In addition, studies have indicated that TMD severity is associated with decreased oral health-related quality of life (OHRQL), making early detection of TMD cases significant (10).

Several evaluation methods have been developed, including questionnaires, clinical indicators, patient history indicators, and diagnostic criteria (11-16), such as the Helkimo Index (17), the American Academy of Oral and Facial Pain Questionnaire (AAOP) (12), and the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) (14).

The RDC/TMD questionnaire developed in 1992 is one

of the few measurement methods that provide an accurate and usable index for diagnosing TMD (18, 19). The most comprehensive version of the benchmark was published under the name DC/TMD in 2014 (20). DC/TMD is a guideline for assessing patients with temporomandibular joint disorders consisting of two axes, with axis I associated with clinical examinations of TMJ disorders. In contrast, axis II refers to social and psychological factors associated with TMD (20-22). DC/TMD passed rigorous tests in several languages for temporal disorders (TMDs) and intra-articular disorders, which are typical and associated with pain (6). An assessment from DC/TMD Axis I showed high levels of reliability and reliability for most diagnoses (23, 24). While reliability is concerned with the stability of the questionnaire over time, validity refers to how effectively the questionnaire evaluates what it is designed to measure (25). A standard technique called the DC/TMD Symptom Questionnaire is used to assess the symptoms of temporomandibular disorders (TMD) (20). Several studies have reported successful DC/TMD translation and validation in Spanish, Portuguese, French, German, Italian, Dutch, Turkish, Japanese, Korean, and others (22, 26-33). However, Farsi-speaking researchers cannot access the questionnaire since it has not yet been translated into Persian.

2. Objectives

This study was conducted by Kermanshah University of Medical Sciences' dentistry students to determine the accuracy and validity of the Persian translation of the DC/TMD Symptom Questionnaire.

3. Methods

A cross-sectional study was conducted at the Faculty of Dentistry in Kermanshah In April 2022 (Code of ethics: IR.KUMS.REC.1401.366).

The study population comprised all dental students who had completed the basic science course at the Faculty of Dentistry in Kermanshah. A sample of 150 students was selected using stratified random sampling with proportional allocation to each semester.

The DC/TMD Symptom Questionnaire consists of 12 items that assess the presence and severity of TMD symptoms, such as pain or discomfort in the jaw, face, or temple region, difficulty opening or closing the mouth, clicking, or popping sounds in the jaw joint and headaches (20).

A fluent English speaker performed the translation into Farsi, which was then adjusted by a group of

specialists in orofacial pain, oral diseases, orthodontics, prosthodontics, biostatistics, and Persian language editing. The English translation of the Farsi translation was then contrasted with the original questionnaire using native English speakers' translating skills. A committee of experts evaluated each question's suitability using a four-point rating system. The content validity index (CVI) was 0.95, indicating acceptable content validity.

First, 30 students completed the questionnaire two weeks later. The same sample of 30 dentistry students answered the survey again to determine test-retest reliability. The agreement between the two sets of scores was assessed using the intraclass correlation coefficient (ICC). Cronbach's alpha coefficient was used to evaluate internal dependability.

Exploratory factor analysis, Bartlett's tests, and the Kaiser-Meyer-Olkin (KMO) index were used to evaluate the construct validity (34). Correlations between variables were examined using Pearson correlation analysis, group comparisons were conducted using *t*-tests, and comparisons across multiple groups were assessed using ANOVA (35).

Scree Plot: This plot shows the eigenvalues for each extracted component. The largest eigenvalue starts at the top, thus indicating a descending plot.

4. Results

This study's content validity index (CVI) was 0.95, indicating good validity. A total of 30 students completed the questionnaire and then re-completed by the same students after three weeks. The reliability was relatively high since the intraclass correlation coefficient (ICC) was 0.98. About 150 students ultimately completed the questionnaire to determine construct validity.

The Kaiser-Meyer-Olkin (KMO) index was 0.62 for the entire questionnaire, indicating that the questions were acceptable. The KMO index is a number between 0 and 1 calculated for each question and the questionnaire. A value above 0.5 is acceptable for individual questions, and a value above 0.6 is acceptable for the entire questionnaire. Therefore, the questionnaire questions were acceptable and significant at a desirable level.

Additionally, Bartlett's test was significant ($P=0.0001$), indicating the presence of a relationship between the questions in the questionnaire. Therefore, the data can be considered effective with a 95% confidence level, and the questionnaire has acceptable validity (Table 1).

Based on this plot, the third point is the elbow point, but the fifth can also be considered the elbow point. Therefore, the questions are placed between factors 2 to 4.

Table 1. Cronbach's Alpha by Question Groups

1	Factor	Cronbach's Alpha
2	Questions 2,3,4	0.800
3	Questions 1,5,6,7	0.819
4	Questions 8,9,10	0.525
5	Questions 11 - 14	0.903
6	All questions	0.900

Cronbach's alpha was calculated to determine the variables' internal consistency.

Based on the coefficients of all factors, they had a high level of internal consistency, except for questions 8, 9, and 10, which had a coefficient of 0.525, which was undesirable. Considering these questions and questions 11 to 14, the coefficient increased to 0.903. As the internal consistency of all questions (Cronbach's alpha = 0.90) was equal to or greater than the consistency of the factors, it can be concluded that the questionnaire is a unidimensional tool with high reliability. Therefore, all 18 questions are factorable and can be summed up in the analysis.

About 150 students aged 21 and 41, with a mean age of 26.54, participated in this study. The majority of the participants in the research (84, or 56%) were male, single (138, or 92%), and in their tenth semester (43, or 28.7%). There were an estimated 34% of pupils with TMD.

The results indicated that most patients were pain-free, with the highest pain level reported during tooth grinding. In contrast, the lowest pain level was reported during kissing, talking, and bending activities (Table 2).

5. Discussion

TMD is a common jaw and face disease caused by various factors common in middle-aged and young people, which are characterized by discomfort, soreness, and TMJ dysfunction, making it difficult to chew, speak, and swallow (18). According to the current study, 34% of participants had TMD. A few more studies have shown prevalence rates much higher than 25 and 33%, but most earlier investigations estimated the prevalence of TMD to be between 5 and 12% in the general population (6).

This study aimed to translate and check the validity and reliability of the Persian translation of the standard DC/TMD questionnaire as a practical and valuable global tool in temporomandibular disorders.

The results of this study can help Persian language researchers of the temporomandibular area in extensive research and screening of large communities to

investigate temporomandibular disorders so that these researchers can use this questionnaire as a practical tool for quick and effective screening of patients in large communities.

The DC/TMD is a comprehensive diagnostic tool, including Axis I and II components. DC/TMD Axis I is used to diagnose TMD based on clinical and imaging examinations. Axis I includes a standardized clinical examination protocol and a set of diagnostic criteria based on physical signs and symptoms. The clinical examination protocol includes the assessment of joint sounds, range of motion, and palpation of the masticatory muscles and TMJ. The diagnostic criteria include both specific and non-specific TMD diagnoses, such as disc displacement, osteoarthritis, myofascial pain, and headache attributed to TMD (20).

TMD's psychological and behavioral aspects are evaluated using the DC/TMD Axis II. Axis II consists of several validated questionnaires that measure psychological distress, behavioral variables, and pain-related impairments probably associated with TMD symptoms. The Patient Health Questionnaire (PHQ), the Graded Chronic Pain Scale (GCPS), and the Oral Behaviors Checklist (OBC) are the questionnaires utilized in Axis II. The psychological and behavioral aspects that may influence TMD symptoms can be evaluated using the DC/TMD Axis II questionnaires. Anxiety, sadness, stress, and dental habits like grinding or clenching teeth can be contributing causes. The validated questionnaires used in Axis II provide valuable information that can aid in developing effective treatment strategies (20). Additionally, all Axis II instruments have been separated into separate documents, and demographic questions are placed in a separate document. This modular organization enhances flexibility in adapting the DC/TMD protocol to specific settings. For instance, one setting may use only the Axis II screening instruments, while another may utilize the complete Axis II instruments. Similarly, one setting might gather demographic information through an existing mandatory clinic registration form, while another may require a separate form for research

Table 2. Pain Distribution by Percentage and Abundance

Questions	Abundance	Percent
Painless	46	30.7
Occasional pain	27	18
Constant pain	6	4
Pain when chewing hard food	28	18.7
Pain when opening the mouth and moving the jaw forward or right and left	25	16.7
Pain when clenching, grinding teeth, or chewing gum	31	20.7
Pain during other jaw activities, such as talking, kissing, or yawning	20	13.3

purposes (20, 22).

The DC/TMD Symptom Questionnaire is part of Axis I of the DC/TMD to diagnose TMD based on clinical and imaging examinations. The DC/TMD Symptom Questionnaire is a tool developed to assess the presence and severity of TMD symptoms. The questionnaire consists of 12 items that assess the frequency and severity of pain, restricted jaw movement, and other TMD-related symptoms (20). According to the developer of the DC/TMD, the Patient History Questionnaire (PHQ) of the RDC/TMD has undergone a complete revision for the DC/TMD, resulting in its renaming as the Symptom Questionnaire (SQ) to differentiate it from the pre-existing PHQ-9 and PHQ-15 developed independently of the DC/TMD. There are several notable differences between the RDC/TMD PHQ and the DC/TMD SQ. Firstly, the DC/TMD SQ primarily focuses on Axis I diagnostic requirements (excluding the pain chronicity question). The TMD pain screener was initially designed as a stand-alone screening instrument suitable for various settings. The DC/TMD SQ now includes most of the TMD pain screener's scope, but there is a difference in the pain-related filter item between the two instruments. The TMD pain screener focuses on pain in the jaw or temple area to maximize specificity about other conditions that can cause TMD-like pain. In contrast, the DC/TMD SQ aims to be more inclusive and asks about pain in the jaw, temple, ear, or front of the ear, with confirmation through clinical examination. The potential impact of this difference in wording on the outcomes is yet to be determined empirically or logically. The DC/TMD SQ alone will suffice as the pain history collection instrument in many settings, rendering the TMD pain screener unnecessary. However, there may be settings where only the TMD pain screener is required. Translating both instruments is essential to provide a complete set of language instruments for all users in a particular language setting (20, 22).

The validity and reliability of the DC/TMD Symptom Questionnaire's Persian translation were evaluated in the current study using a dentistry sample. The

Persian translation exhibited outstanding reliability (ICC coefficient of 0.98) and strong internal consistency (Cronbach's alpha value of 0.90 or higher). The content validity index (CVI) was 0.95, indicating satisfactory content validity.

The ability to translate the DC/TMD Symptom Questionnaire into different languages is important because it allows for standardized assessment of TMD symptoms across diverse populations and languages. This facilitates cross-cultural research and improves diagnostic accuracy, which can lead to better patient outcomes and quality of life. Furthermore, the availability of valid and reliable translated versions of the questionnaire allows for comparing TMD prevalence and severity across different and large populations, which can develop effective TMD treatment strategies.

5.1. Strengths and Limitations

As validated in the present study, the Persian translation of the DC/TMD Symptom Questionnaire is a valuable tool for assessing TMD symptoms in the Persian-speaking population. This questionnaire has been translated into Farsi for the first time, and researchers can utilize it as a screening tool in their studies. Additionally, clinicians can use it to assess patients' progress during treatment. It is crucial to remember that the DC/TMD SQ's validity and reliability should be evaluated among multiple groups and a broader population, and the questionnaire alone is insufficient for diagnosing TMD. A thorough clinical examination and diagnostic imaging are also necessary to ensure accurate diagnosis and treatment planning.

5.2. Conclusions

The Kaiser-Meyer-Olkin (KMO) index was 0.62 for the entire questionnaire, indicating that the questions were acceptable. The KMO index is a number between 0 and 1 calculated for each question and the questionnaire. A value above 0.5 is acceptable for individual questions, and

a value above 0.6 is acceptable for the entire questionnaire. Therefore, the questionnaire questions were acceptable and significant at a desirable level.

Additionally, Bartlett's test was significant ($P=0.0001$), indicating the presence of a relationship between the questions in the questionnaire. Therefore, the data has a 95% chance of being effective, and the questionnaire has acceptable validity. (Table 1).

In addition, the Persian translation exhibited outstanding reliability (ICC coefficient of 0.98) and strong internal consistency (Cronbach's alpha value of 0.90 or higher). The content validity index (CVI) of 0.95 indicates satisfactory content validity.

Based on the results, the DC/TMD Symptom Questionnaire is a validated tool that can aid in assessing TMD symptoms. The availability of translated versions of the questionnaire allows for the standardized evaluation of TMD symptoms across different populations and languages, facilitating cross-cultural research and improving diagnostic accuracy. The Persian version of the questionnaire can be used in clinical settings for TMD diagnosis and evaluation in Persian-speaking populations. The study has important implications for clinical practice. Conducting further studies to assess the reliability and validity of the DC/TMD Symptom Questionnaire in different populations and larger groups would be beneficial.

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Footnotes

Authors' Contribution: Conceptualization: Dr. Sahar Mafi; data curation: Dr. Farzan Soltani; investigation: Dr.

Farzan Soltani, Dr. Ladan Jamshidi; formal analysis: Dr. Maryam Rad; methodology: Dr. Sahar Mafi, Dr. Maryam Rad; project administration: Dr. Sahar Mafi; supervision: Dr. Sahar Mafi, Dr. Ladan Jamshidi; resource: Kermanshah Dental School; writing- original draft: Dr. Farzan Soltani; writing- review & editing: Dr. Sahar Mafi.

Conflict of Interests: The authors have declared that no conflict of interest exists.

Data Reproducibility: The data used to support the findings of this study are available upon request. Researchers interested in accessing the data can contact the corresponding author to discuss the availability and potential collaboration. The data will be made available by any applicable ethical and legal restrictions.

Ethical Approval: This study obtained its ethical approval from the Kerman Ethical Committee. The research protocol and all related procedures were reviewed and found to comply with ethical standards and guidelines. The approval number is [IR.KUMS.REC.1401.366](https://doi.org/10.1008/s41432-023-00911-6).

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References

1. Mortazavi N, Tabatabaei AH, Mohammadi M, Rajabi A. Is bruxism associated with temporomandibular joint disorders? A systematic review and meta-analysis. *Evid Based Dent.* 2023;**24**(3):144. [PubMed ID: 37474733]. <https://doi.org/10.1038/s41432-023-00911-6>.
2. Khan J, Singer SR, Young A, Tanaiutchawoot N, Kalladka M, Mupparapu M. Pathogenesis and differential diagnosis of temporomandibular joint disorders. *Dent Clin North Am.* 2023;**67**(2):259–80. [PubMed ID: 36965930]. <https://doi.org/10.1016/j.cden.2022.10.001>.
3. Thomas DC, Khan J, Manfredini D, Ailani J. Temporomandibular joint disorder comorbidities. *Dent Clin North Am.* 2023;**67**(2):379–92. [PubMed ID: 36965938]. <https://doi.org/10.1016/j.cden.2022.10.005>.
4. Ferrillo M, Nucci L, Giudice A, Calafiore D, Marotta N, Minervini G, et al. Efficacy of conservative approaches on pain relief in patients with temporomandibular joint disorders: a systematic review with network meta-analysis. *Cranio.* 2022;1–17. [PubMed ID: 36148997]. <https://doi.org/10.1080/08869634.2022.2126079>.
5. Hashemipour MA, Moslemi F, Mirzadeh A, Mirzadeh A. Parafunctional habits and their relationship with temporomandibular joint

- disorders in iranian school students. *Meandros Med Dental J*. 2018;**19**(3):247-53. <https://doi.org/10.4274/meandros.41636>.
6. Valesan LF, Da-Cas CD, Reus JC, Denardin ACS, Garanhani RR, Bonotto D, et al. Prevalence of temporomandibular joint disorders: a systematic review and meta-analysis. *Clin Oral Investig*. 2021;**25**(2):441-53. [PubMed ID: 33409693]. <https://doi.org/10.1007/s00784-020-03710-w>.
 7. Kapos FP, Exposto FG, Oyarzo JF, Durham J. Temporomandibular disorders: A review of current concepts in aetiology, diagnosis and management. *Oral Surg*. 2020;**13**(4):321-34. [PubMed ID: 34853604]. [PubMed Central ID: PMC8631581]. <https://doi.org/10.1111/ors.12473>.
 8. Dasukil S, Arora G, Shetty S, Degala S. Impact of prolotherapy in temporomandibular joint disorder: a quality of life assessment. *Br J Oral Maxillofac Surg*. 2021;**59**(5):599-604. [PubMed ID: 33750579]. <https://doi.org/10.1016/j.bjoms.2020.10.014>.
 9. Trize DM, Calabria MP, Franzolin SOB, Cunha CO, Marta SN. Is quality of life affected by temporomandibular disorders? *Einstein (Sao Paulo)*. 2018;**16**(4):eAO4339. [PubMed ID: 30517362]. [PubMed Central ID: PMC6276907]. https://doi.org/10.31744/einstein_journal/2018AO4339.
 10. Qamar Z, Alghamdi AMS, Haydarah NKB, Balateef AA, Alamoudi AA, Abumismar MA, et al. Impact of temporomandibular disorders on oral health-related quality of life: A systematic review and meta-analysis. *J Oral Rehabil*. 2023;**50**(8):706-14. [PubMed ID: 3707871]. <https://doi.org/10.1111/joor.13472>.
 11. Ohrbach R, Dworkin SF. AAPT diagnostic criteria for chronic painful temporomandibular disorders. *J Pain*. 2019;**20**(11):1276-92. [PubMed ID: 31004786]. <https://doi.org/10.1016/j.jpain.2019.04.003>.
 12. Borges GL, Tardelli JD, Botelho AL. Analysis of the diagnostic accuracy of questionnaires for TMD in relation to gold RDC/TMD and DC/TMD standards: Systematic review. *J Dent UNESP*. 2023.
 13. Christidis N, Lindstrom Ndanshau E, Sandberg A, Tsilingaridis G. Prevalence and treatment strategies regarding temporomandibular disorders in children and adolescents-A systematic review. *J Oral Rehabil*. 2019;**46**(3):291-301. [PubMed ID: 30586192]. <https://doi.org/10.1111/joor.12759>.
 14. de Oliveira Fernandes GV, Marcelino V, Marcelino S, Baptista S, Paço M, Guimaraes AS, et al. Intra-and inter-examiner reliability for diagnostic criteria of temporomandibular disorders (DC/TMD)-AXIS 1: Assessment in a sample of students. *Revista Fluminense de Odontologia*. 2024;**1**(63):87-109.
 15. Pastore GP, Goulart DR, Pastore PR, Prati AJ, de Moraes M. Comparison of instruments used to select and classify patients with temporomandibular disorder. *Acta Odontol Latinoam*. 2018;**31**(1):16-22. [PubMed ID: 30056462].
 16. Borges REA, Mendonca L, Dos Santos Calderon P. Diagnostic and screening inventories for temporomandibular disorders: A systematic review. *Cranio*. 2021;**1**-7. [PubMed ID: 34275426]. <https://doi.org/10.1080/08869634.2021.1954376>.
 17. Alonso-Royo R, Sanchez-Torrelo CM, Ibanez-Vera AJ, Zagalaz-Anula N, Castellote-Caballero Y, Obrero-Gaitan E, et al. Validity and reliability of the helkimo clinical dysfunction index for the diagnosis of temporomandibular disorders. *Diagnostics (Basel)*. 2021;**11**(3). [PubMed ID: 33800185]. [PubMed Central ID: PMC8000811]. <https://doi.org/10.3390/diagnostics11030472>.
 18. Tak MM, Chalkoo AH, Devi R. An institutional survey for self-awareness assessment of temporomandibular joint disorder symptoms prevailing in dental faculty, staff members & dental students in Government Dental College Srinagar. *J Adv Med Dent Sci Res*. 2022;**10**(6):36-42.
 19. Fernandez-de-Las-Penas C, Von Piekartz H. Clinical reasoning for the examination and physical therapy treatment of temporomandibular disorders (TMD): A narrative literature review. *J Clin Med*. 2020;**9**(11). [PubMed ID: 33212937]. [PubMed Central ID: PMC7698332]. <https://doi.org/10.3390/jcm9113686>.
 20. Schiffman E, Ohrbach R, Truelove E, Look J, Anderson G, Goulet JP, et al. Diagnostic criteria for temporomandibular disorders (DC/TMD) for clinical and research applications: Recommendations of the international RDC/TMD consortium network* and orofacial pain special interest group dagger. *J Oral Facial Pain Headache*. 2014;**28**(1):6-27. [PubMed ID: 24482784]. [PubMed Central ID: PMC4478082]. <https://doi.org/10.11607/jop.1151>.
 21. Stasiak G, Maracci LM, de Oliveira Chami V, Pereira DD, Tomazoni F, Bernardon Silva T, et al. TMD diagnosis: Sensitivity and specificity of the Fonseca Anamnestic Index. *Cranio*. 2023;**41**(3):199-203. [PubMed ID: 33108257]. <https://doi.org/10.1080/08869634.2020.1839724>.
 22. Rongo R, Ekberg E, Nilsson IM, Al-Khotani A, Alstergren P, Conti PCR, et al. Diagnostic criteria for temporomandibular disorders (DC/TMD) for children and adolescents: An international Delphi study-Part 1-Development of Axis I. *J Oral Rehabil*. 2021;**48**(7):836-45. [PubMed ID: 33817818]. [PubMed Central ID: PMC8252391]. <https://doi.org/10.1111/joor.13175>.
 23. Srivastava KC, Shrivastava D, Khan ZA, Nagarajappa AK, Mousa MA, Hamza MO, et al. Evaluation of temporomandibular disorders among dental students of Saudi Arabia using Diagnostic Criteria for Temporomandibular Disorders (DC/TMD): a cross-sectional study. *BMC Oral Health*. 2021;**21**(1):211. [PubMed ID: 33902543]. [PubMed Central ID: PMC8077893]. <https://doi.org/10.1186/s12903-021-01578-0>.
 24. Yap AU, Lei J, Fu KY, Kim SH, Lee BM, Park JW. DC/TMD Axis I diagnostic subtypes in TMD patients from Confucian heritage cultures: a stratified reporting framework. *Clin Oral Investig*. 2023;**27**(8):4459-70. [PubMed ID: 37243820]. <https://doi.org/10.1007/s00784-023-05067-2>.
 25. Bull C, Byrnes J, Hettiarachchi R, Downes M. A systematic review of the validity and reliability of patient-reported experience measures. *Health Serv Res*. 2019;**54**(5):1023-35. [PubMed ID: 31218671]. [PubMed Central ID: PMC6736915]. <https://doi.org/10.1111/1475-6773.13187>.
 26. Tedin Ng FN, Kadir K, Yusof ZYM. Reliability and validity of the malaysian english version of the diagnostic criteria for temporomandibular disorder (M-English DC/TMD). *Healthcare (Basel)*. 2022;**10**(2). [PubMed ID: 35206943]. [PubMed Central ID: PMC8871999]. <https://doi.org/10.3390/healthcare10020329>.
 27. Asendorf A, Mollenkamp J, Schierz O, Rauch A, Asendorf T, Rammelsberg P, et al. Interexaminer reliability of the German version of the DC/TMD. *J Oral Rehabil*. 2021;**48**(1):28-34. [PubMed ID: 32648606]. <https://doi.org/10.1111/joor.13054>.
 28. Franco-Micheloni AL, Fernandes G, Goncalves DA, Camparis CM. Temporomandibular disorders among Brazilian adolescents: reliability and validity of a screening questionnaire. *J Appl Oral Sci*. 2014;**22**(4):314-22. [PubMed ID: 2514204]. [PubMed Central ID: PMC4126828]. <https://doi.org/10.1590/1678-77520130694>.
 29. Osiewicz M, Lobbzoo F, Loster B, Wilkosz M, Naeije M, Ohrbach R. Research diagnostic criteria for temporomandibular disorders (RDC/TMD)-the polish version of a dual-axis system for the diagnosis of TMD. RDC/TMD form. *J Stomatol*. 2013;**66**(5):576-649. <https://doi.org/10.5604/00114553.1065048>.
 30. González Y, Miranda-Rivera Y, Espinosa I. Cross-cultural adaptation of research diagnostic criteria for temporomandibular disorders (RDC/TMD). *Revista Facultad de Odontología Universidad de Antioquia*. 2013;**25**:11-25.
 31. Hietaharju M, Kivimäki I, Heikkilä H, Napankangas R, Teerijoki-Oksa T, Tanner J, et al. Comparison of Axis II psychosocial assessment methods of RDC/TMD and DC/TMD as part of DC/TMD-FIN phase II validation studies in tertiary care Finnish TMD pain patients. *J Oral Rehabil*. 2021;**48**(12):1295-306. [PubMed ID: 34537976]. <https://doi.org/10.1111/joor.13260>.
 32. Cavalcanti RF, Studart LM, Kosminsky M, de Goes PS. Validation of the multimedia version of the RDC/TMD axis II questionnaire in Portuguese. *J Appl Oral Sci*. 2010;**18**(3):231-6. [PubMed ID: 20856999]. [PubMed Central ID: PMC5349054]. <https://doi.org/10.1590/s1678-7752010000300006>.

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33. Skeie MS, Frid P, Mustafa M, Assmus J, Rosen A. DC/TMD examiner protocol: Longitudinal evaluation on interexaminer reliability. *Pain Res Manag.* 2018;**2018**:7474608. [PubMed ID: 30356427]. [PubMed Central ID: PMC6178177]. <https://doi.org/10.1155/2018/7474608>.
 34. Iskandar I, Ishak P. Analisis kepuasan pasien rawat jalan menggunakan kaiser meyer olkin untuk pembelian obat kembali di rsud kota makassar. *J Pharm Appl Comput Sci.* 2023;**1**(1):1-9. <https://doi.org/10.59823/jopacs.viii.14>.
 35. Burger T. Controlling for false discoveries subsequently to large scale one-way ANOVA testing in proteomics: Practical considerations. *Proteomics.* 2023;**23**(18). e2200406. [PubMed ID: 37357151]. <https://doi.org/10.1002/pmic.202200406>.