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치의학석사 학위논문

**A Study on the Reliability of the Korean Version of
Diagnostic Criteria for Temporomandibular
Disorders (DC/TMD) Axis II Questionnaires**

한국어판 측두하악장애 진단기준

(DC/TMD) Axis II 설문지의 신뢰도에 관한 연구

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손 병 진

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–ABSTRACT–

**A Study on the Reliability of the Korean Version of
Diagnostic Criteria for Temporomandibular Disorders
(DC/TMD) Axis II Questionnaires**

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For the correct evaluation of patients with temporomandibular disorders (TMD) as a musculoskeletal disease that causes dysfunction, as well as chronic pain in jaw joint and related tissues, an assessment of behavioral and psychosocial factors should be included as well as physical diagnosis. The Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) includes the Axis II assessment of behavioral and psychosocial factors that may affect the outcome as well as physical diagnosis of Axis I, and the Axis II questionnaires are likely to limit the usefulness of the original version in translation into each country's language due to cultural and sociodemographic differences. The purpose of this study is to translate the DC/TMD Axis II questionnaires into Korean version and evaluate the reliability and validity of the Korean version of DC/TMD Axis II questionnaires.

The Korean versions of the DC/TMD questionnaires were distributed to 123 participants (60 men, 63 women). The test-retest reliability was assessed among the same subjects with one- or two-week time interval, the subjects who had TMD or orofacial pain symptoms did not receive any treatment until the retest administration was completed.

The internal consistency reliability of Graded Chronic Pain Scale, Jaw Function Limitation Score-20, Patient Health Questionnaire-9, Generalized Anxiety Disorder-7, Patient Health Questionnaire-15, and Oral Behaviors Checklist were 0.89, 0.90, 0.68, 0.92, 0.72, and 0.78, respectively using the Cronbach's alpha coefficient of first-tested questionnaires. The test-retest correlation coefficients of each question showed a good to excellent reliability(0.41-1.00), and the intraclass coefficient (ICC) for each subscale of DC/TMD questionnaires was verified fairly to excellently reliable(0.50-0.92).

The Korean language version of DC/TMD Axis II Questionnaires demonstrated good reliability. It can be used as a valuable tool to analyze the psychosocial and behavioral aspects of TMD or orofacial patients in Korea.

Key words: Diagnostic Criteria for Temporomandibular Disorders (DC/TMD), Questionnaires, Psychosocial aspect, Internal consistency, Test-retest, Reliability

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KOREAN ABSTRACT

I. INTRODUCTION

Temporomandibular disorders (TMD) are one of the significant public health issues that afflict approximately 5% to 12% of the general population. TMD is the second most common musculoskeletal condition (after chronic low back pain) known as pain and dysfunction of temporomandibular joint and masticatory muscles.¹⁾ TMD patients represent pain-related, functional and intra-articular clinical problems that involve the masticatory muscles, the temporomandibular joints (TMJs) and related structures.²⁾ Pain-related TMD can impact the individual's daily activities, psychosocial functioning, and quality of life.¹⁾

One of the most widely used diagnostic protocols for standardized TMD assessment was the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) since its publication in 1992.¹⁾ Recently, updated diagnostic criteria for TMD (DC/TMD) were published by the RDC/TMD Consortium Network of the International Association of Dental Research (IADR) and the Special Interest Group on Orofacial Pain of the International Association for the Study of Pain (IASP) to assess TMD in a standardized way in clinical and research settings in 2012.¹⁾ And the 'Validation Project' was performed to develop validated DC/TMD that would have widespread use in the clinical setting as well as in research.^{1, 3)} The 'Validation Project' subsequently was published revised validated Axis I TMD diagnostic criteria for pain-related TMD and screening criteria for TMJ intra-articular disorders in 2013.^{1, 3)}

DC/TMD is a dual-axis framework for the assessment and diagnosis of Axis I physical diagnoses for the most common TMDs and Axis II self-report psychosocial and behavioral screening questionnaires.^{1, 4)} The new evidence-based DC/TMD recommendations allow for identification of patients with a range of simple to complex TMD manifestations. The

DC/TMD is suitable for use in clinical and research environments, and provides a common language for clinicians and researchers. Furthermore, clinical applications using DC/TMD will be the basis for future researches.³⁾

DC/TMD Axis II is composed of psychosocial and behavioral assessment. These Axis II questionnaires are recommended as screening tools for routine assessment of psychosocial and behavioral factors that may affect patients' response to treatment.⁴ These tools are the Graded Chronic Pain Scale (GCPS),^{5, 6, 7)} pain drawing,^{7, 8)} the Jaw Functional Limitation Scale (JFLS),^{7, 9)} the Patient Health Questionnaire (PHQ),^{7, 10, 11)} the Generalized Anxiety Disorder (GAD)^{7, 12)} and the Oral Behaviors Checklist (OBC).^{7, 13, 14, 15)}

The Graded Chronic Pain Scale (GCPS) is a short, reliable, and valid instrument that assesses pain intensity and pain-related disability.⁶⁾ The Jaw Function Limitation Score questionnaire (JFLS-20) assesses global limitations across mastication, jaw mobility, and verbal and emotional expression.^{9, 16)} The Patient Health Questionnaire-9 (PHQ-9) assessment uses the for depression (with cutoffs of 5, 10, 15, and 20 representing, respectively, mild, moderate, moderately severe, and severe levels of depression).^{17, 18)} The Generalized Anxiety Disorder-7 (GAD-7) assesses anxious mood and behavior for anxiety (with cutoffs of 10 and 15 representing, respectively, moderate and severe levels of anxiety).^{7, 12)} The Patient Health Questionnaire-15 (PHQ-15) assesses non-specific physical symptoms, also referred to as functional symptoms or medically unexplained symptoms; this scale corresponds to the Somatization scale in the RDC/TMD in terms of utility and construct (with cutoffs of 5, 10, and 15 representing, respectively, low, medium, and high somatic symptom severity)^{7, 19)} And the Oral Behaviors Checklist (OBC) assesses the frequency of oral parafunctional behaviors.^{7, 13, 14)} Table 1 summarizes each item of

assessment in the DC/TMD axis II questionnaires.

The purpose of this study is to translate the DC/TMD Axis II questionnaires into Korean version and evaluate the reliability and validity of the Korean version of DC/TMD Axis II questionnaires.

II. MATERIALS AND METHODS

1. Subjects and data collection

The subjects were recruited from an advertisement for participants as a research topic on the reliability of the DC/TMD questionnaires. The number of subjects was 123 (60 men, and 63 women), and the average age of the subjects was 36.4 ± 12.1 years ranged from 20 to 68 years. Fifty-three (43%) of the subjects had TMD or orofacial pain symptoms, and they did not receive any treatment until the retest administration was completed. Table 2 shows the demographic distribution of the subjects by gender and age.

Before the survey, all the subjects got the brief information about the Korean language version of DC/TMD Axis II questionnaires and all the survey was performed by a TMD and orofacial pain specialist. This research was approved by the Institutional Review Board of the Seoul National University Dental Hospital (CRI19006)

2. DC/TMD Axis II Questionnaires

1) Graded Chronic Pain Scale (GCPS)

The Chronic Pain Grade Questionnaire is a self-report instrument composed of 7 items that are scored on an 11-point Likert scale, with a total range of 0–70 points. It was originally designed in English for the evaluation of the intensity of chronic pain,⁶⁾ and has been verified and translated in several languages.^{20, 21, 22)} The version updated in 2010 converted the initial questionnaire into a scale of 8 items, the Graded Chronic Pain Scale 2.0 (GCPS).^{5, 23)} The GCPS Version 2.0 includes the 3 items for pain intensity, 4 items for function, and one item for number of days of pain.⁷⁾ The two GCPS subscales are: (1)

Characteristic Pain Intensity (CPI), which reliably measures pain intensity, with $\geq 50/100$ considered “high intensity,” and (2) the pain-disability rating, which is based on number 9 of days that pain interferes with activity and on extent of interference with social, work, or usual daily activities.¹⁾ The Korean version of the GCPS questionnaire full version is listed in Appendix 1.

2) Pain Drawing

The pain drawing assesses for local, regional, or widespread pain.^{7, 8)} However, there is no single method for assessing and interpreting the analog drawing of pain locations on the body.²⁴⁾ Thus, in this study, the pain drawing items were excluded from the reliability measurement because it was difficult to express the measured values for the pain drawing. The Korean version of the pain drawing questionnaire is listed in Appendix 2.

3) Jaw Function Limitation Sore (JFLS-20)

The JFLS-20 is an organ-specific instrument comprising for 3 constructs assessing limitations in mastication, jaw mobility, and verbal and emotional expression of the masticatory system; the 3 scales exhibit properties that are ideal for both research and patient evaluation in patient groups with a range of functional limitations of the jaw.⁹⁾ Three constructs (mastication, vertical jaw mobility, and emotional and verbal expression) comprising a total of 20 items were identified along with a global scale.⁹⁾ The Korean version of the JFLS questionnaire full version is listed in Appendix 3.

4) Patient Health Questionnaire-9 (PHQ-9)

The Patient Health Questionnaire (PHQ) is a self-administered version of the Primary Care Evaluation of Mental Disorders diagnostic instrument for common mental disorders. The PHQ-9 is the depression module, which scores each of the nine diagnostic criteria for major depression in Diagnostic and Statistical Manual Fourth Edition (DSM IV) as ‘0’ (not at all) to ‘3’ (nearly every day).^{10, 11, 25, 26)} The 9 items cover experience of pleasure, feeling down, sleep disruption, energy levels, appetite, feeling a failure, trouble concentrating, speaking slowly or being fidgety and having negative thoughts around suicide or self-harm over the previous 2 weeks.²⁵⁾ Depression severity using a total score of PHQ-9 indicates 0-4 none, 5-9 mild, 10-14 moderate, 15-19 moderately severe, 20-27 severe.²⁶⁾ The Korean version of the PHQ-9 questionnaire full version is listed in Appendix 4.

5) Generalized Anxiety Disorder-7 (GAD-7)

The GAD-7 consists of seven items exploring the prior 2-week period and is a self-administered patient questionnaire normally used as a screening tool and as a severity measure for patients with generalized anxiety disorder.^{27, 28)} The GAD-7 items include: 1) nervousness; 2) inability to stop worrying; 3) excessive worry; 4)restlessness; 5) difficulty in relaxing; 6) easy irritation; and 7) fear of something awful happening. The GAD-7 asks participants to rate how often they have been bothered by each of these 7 core symptoms over the past 2 weeks. Response categories are “not at all,” “several days,” “more than half the days,” and “nearly every day,” scored as 0, 1, 2, and 3, respectively. The total score of the GAD-7 ranges from 0 to 21.^{7, 29)} The Korean version of the GAD-7 questionnaire full version is listed in Appendix 5.

6) Patient Health Questionnaire-15 (PHQ-15)

The PHQ-15 is a brief, self-administered questionnaire that may be useful in screening for somatization and in monitoring somatic symptom severity in clinical practice and research.^{7, 19)} The PHQ-15 comprises 15 somatic symptoms from the PHQ, each symptom scored from 0 (“not bothered at all”) to 2 (“bothered a lot”).¹⁹⁾ The grade categories were minimal (PHQ-15 score = 0–4), low (score = 5–9), medium (score = 10–14), and high (score = 15–30) levels of somatic symptom severity.¹⁹⁾ The Korean version of the PHQ-15 questionnaire full version is listed in Appendix 6.

7) Oral Behaviors Checklist (OBC)

The Oral Behaviors Checklist (OBC) quantifying the frequency of observable and non-observable oral behaviours (eg; clenching, grinding, chewing gum, holding objects) is comprised of 21 items with five response options (0-4, ranging from none to all the time).

These 21 items are organized by time: sleep activities comprised of 2 behaviors, and waking activities comprised of 19 behaviors.^{30, 31)} The Korean version of the OBC questionnaire full version is listed in Appendix 7.

2. Translation and cultural adaptation of DC/TMD Axis II Questionnaires

For the Korean language translation and cultural adaptation of the DC/TMD Axis II questionnaires, the official guidelines of A Consortium Focused On Clinical Translation of International Network for Orofacial Pain and Related Disorders Methodology (INFORM) Consortium Network were followed including forward translation and back translation by professional translators, independent review of the back translation, and

repeat forward and back translation until the items were semantically correct.^{32, 33, 34)} The interim instrument was reviewed by an expert panel team for cultural equivalence, and final changes were made. The final instrument was evaluated by bilingual individuals in a pre-field test and in a field test for readability and language congruency.^{31, 34)} In this way, the Korean translation of the DC/TMD Axis II Questionnaire is completed.

3. Statistical analysis

Internal consistency was measured using Cronbach's alpha for each questionnaire. This method has the advantage of calculating alpha coefficient only through one test.^{19, 35, 36)} The range of Cronbach's alpha shows preferable in 0.7-0.9 even though values as low as 0.6 may be acceptable.

Test-retest reliability was assessed among the same subjects with one- or two-week time interval using intraclass coefficients (ICCs), Spearman correlation coefficients, and kappa value.

The intraclass coefficient is more advantageous than Pearson's coefficient since it counts for the actual magnitude of scores and the agreement between ratings, and not only the correlation and linear association among variables.³⁵⁾ The statistical analyses were completed by SPSS (version 19.0).

III. RESULTS

1. Graded chronic pain scale (GCPS)

Cronbach's coefficient of GCPS was 0.89, indicating a high internal consistency for a scale of only 7 items except for question number 1 ("On how many days have you felt pain in the past 6 months?"). However, if question number 1 of GCPS is included, the Cronbach alpha is very low at 0.34. The intraclass correlation coefficients of sub-scales ranged from 0.60 to 0.92 showed moderate to excellent reliability. (Table 3) Test-retest reliability of each of the questions ranged from 0.61 to 0.85 analyzed with Spearman's rho correlation coefficient. (Table 4) Graded Chronic Pain (GCP) scale was obtained from pain intensity, disability days, and disability score. The test-retest reliability of GCP scale was 0.73 measured by kappa value that showed a good reliability. (Table 5) Thus, The GCP scale was used to evaluate the physical status of the patients.

2. Jaw Function Limitation Score (JFLS-20)

Cronbach's coefficient of JFLS-20 was 0.90, indicating a high internal consistency for a scale of all 20 items. The intraclass correlation coefficients of sub-scales of JFLS-20 ranged from 0.77 to 0.86 showed good to excellent reliability. (Table 6) Test-retest reliability for each of the questions ranged from 0.41 to 0.86 analyzed with Spearman's rho correlation coefficient indicating fair to excellent reliability. (Table 7)

3. Patient Health Questionnaire-9 (PHQ-9)

Cronbach's coefficient of PHQ-9 was 0.68, indicating an acceptable internal consistency

for a scale of all 9 items. And test-retest correlation coefficients of each of questions ranged from 0.61 to 0.83 showed fair to excellent reliability. (Table 8) The test-retest reliability of depression severity using a total score of PHQ-9 was 0.56 measured by kappa statistics that means fairly reliable.(table 9) In addition, test-retest correlation of extra-question of PHQ-9 was 0.60.

4. Generalized Anxiety Disorder (GAD-7)

Cronbach's coefficient of GAD-7 was 0.92, indicating a high internal consistency for a scale of all 7 items. The intraclass correlation coefficients of total score and extra-question of GAD-7 were 0.89 and 0.82 respectively showed excellent reliability. (Table 10) Test-retest reliability for each of the questions ranged from 0.66 to 0.75 analyzed with Spearman correlation coefficient (Table 11) and test-retest correlation of GAD grade was 0.62 measured by kappa value indicating good reliability.

5. Patient Health Questionnaire-15 (PHQ-15)

Cronbach's coefficient of PHQ-15 Questions was 0.72, indicating a good internal consistency for a scale of all 15 items. The intraclass correlation coefficient of total score of PHQ-15 were 0.89 showed excellent reliability. The test-retest correlation of somatic symptom severity (total score of PHQ-15) is 0.62 measured by kappa statistics indicating good reliability. (Table 12) Test-retest reliability for each of the questions ranged from 0.60 to 1.00 analyzed with Spearman correlation coefficient. (Table 13) These results show that the PHQ-15 questionnaire has good to excellent reliability.

6. Oral Behaviors Checklist (OBC)

Cronbach's coefficient of OBC questionnaire was 0.78, indicating a good internal consistency for a scale of all 21 items. The intraclass correlation coefficient of total score of OBC were 0.90 showed excellent reliability. Test-retest reliability for each of the questions ranged from 0.47 to 0.87 analyzed with Spearman correlation coefficient indicating fair to excellent reliability. (Table. 14)

IV. DISCUSSION

The Korean language version of DC/TMD Axis II Questionnaires consist of 7 sub-questionnaires; 1) GCPS, 2) pain drawing, 3) JFLS-20, 4) PHQ-9, 5) GAD-7, 6) PHQ-15, and 7) OBC. All these questionnaires showed good to excellent internal consistency and good test-retest reliability.

1. Graded Chronic Pain Scale (GCPS)

The Korean version of GCPS 2.0 has a high internal consistency and good test-retest correlation. The present version of the GCPS (GCPS 2.0) consists of 8 items. However, question number 1 (“On how many days have you felt pain in the past 6 months?”) was excluded from the statistical analysis because the range of the scores for this item differed widely from those of the other 7 items, and its inclusion reduced the internal consistency of the questionnaire.³⁷⁾ Considering previous researches on the reliability of the GCPS questionnaire translated into many languages of various countries around the world, the internal consistency of GCPS in the United States was 0.91,³⁸⁾ England 0.91,³⁹⁾ Germany 0.84,²¹⁾ South Korea 0.80 to 0.94,⁴⁰⁾ Italy 0.89,²⁰⁾ Portugal-Brazil version 0.78,⁴¹⁾ and Spain 0.87.³⁷⁾ In this study, the Korean version of GCPS has a high internal consistency and good test-retest correlation, and a value of Cronbach alpha of the Korean version GCPS is similar to the Spanish version.³⁷⁾

The GCPS proves to be of clinical value both because it takes little time to complete and because the number of items is manageable, in accordance with current recommendations on the use of short, simple scales that can be adapted to clinical use.⁴²⁾ It is a highly versatile instrument because of its alternative scoring system since, in addition to the range of 0–70

points, it can be complemented by chronic pain grading.³⁷⁾

2. Pain Drawing

The pain drawing assesses for local, regional, or widespread pain. Local pain is limited to the masticatory area, and regional pain often is present because many patients with TMD also have concurrent cervical conditions. When cervical pain is present, then medical assessment, including evaluation by a physician or physical therapist, can be considered.⁸⁾ Widespread pain throughout the body is suggestive of systemic pain disorders such as rheumatic diseases including rheumatoid arthritis and fibromyalgia.^{4, 24)} The pain drawing can be accompanied by the PHQ-15 for more quantitative assessment of the possible presence and severity of comorbid disorders.⁴⁾ However, there is no single method for assessing and interpreting the analog drawing of pain locations on the body.²⁴⁾ In our study, Pain drawing item was excluded from this statistical process because they are difficult to quantify for examination of test-retest reliability. However, in previous studies, pain drawing instrument is reliable as a measure of percentage of body surface in pain and location of pain.⁴³⁾

3. Jaw Function Limitation Scale-20 (JFLS-20)

Previous study of Ohrbach et al. showed that the JFLS-20 is a valid instrument for the measurement of TMD-related functional limitation, and consequently delineates functional limitation from disability.^{9, 16)} And other study for JFLS-20 in Sweden showed internal consistency was and 0.95, and the test-retest reliability was 0.87 for Mastication, 0.94 for Vertical jaw mobility, 0.56 for Verbal and emotional expression, and 0.87 for the JFLS-

20.⁴⁴⁾ Likewise, the Korean version of JFLS-20 has a high internal consistency and good test-retest correlation in this study. However, the lowest item (0.41) was “Eat soft food requiring no chewing (eg, mashed potatoes, apple sauce, pudding, pureed food)” that perhaps it stems from a culture in which Koreans do not enjoy eating the food mentioned in the original English version.

4. Patient Health Questionnaire-9 (PHQ-9)

The PHQ-9 is a psychometrically sound screening tool because it is a short, simple, easy to administer questionnaire, the PHQ-9 has tremendous potential in helping to tackle the growing problem of depression.⁴⁵⁾ The PHQ-9 is translated into many languages in many countries. Past literatures on the reliability of PHQ-9 in various countries show that Cronbach’s alpha is very high; 0.89 in the United States,¹⁷⁾ 0.83 in Scotland,⁴⁶⁾ 0.79 in Thailand,⁴⁷⁾ 0.85 in Nigeria,⁴⁸⁾ 0.86 in Iran,⁴⁹⁾ and 0.88 in Germany⁵⁰⁾. Our results of PHQ-9 showed fair to good test-retest reliability and relatively low levels of internal consistency compared to those of other countries, however, our result of Cronbach’s alpha ($\alpha=0.69$) indicates an acceptable internal consistency. In addition, other Korean study of the PHQ-9 shows that Cronbach’s alpha is 0.89 indicating high internal consistency.⁵¹⁾ Likewise, the Korean version of PHQ-9 has a high internal consistency and good test-retest correlation in this study. Therefore, The PHQ-9 is a reliable and efficient tool for screening for depression and monitoring the response to treatment. It is also a reliable and valid measure of depression severity.²⁵⁾

5. Generalized Anxiety Disorder-7 (GAD-7)

Globally, among clinical and general population samples, the GAD-7 has demonstrated good reliability and cross-cultural validity as a measure of GAD.¹²⁾ And GAD-7 is an efficient and valid self-report anxiety measure for subjects from clinical and nonclinical settings.¹²⁾ Based on past researches on the reliability of GAD-7 translated into several languages, the following are: China's internal consistency is 0.89,⁵²⁾ Germany's internal consistency is 0.89, and test-retest correlation ranged 0.45 to 0.65.¹²⁾ The Cronbach's alpha of South Korea's GAD-7 in migraine patients is 0.92,⁵³⁾ the U.K.'s GAD-7 reliability is 0.91.⁵⁴⁾ The internal consistency of GAD-7 study of pregnant women at Harvard University's study is 0.89.²⁹⁾ Spain's Cronbach alpha is 0.94, and test-retest correlation ranged 0.85 to 0.93.⁵⁵⁾ A GAD-7 study in New York, U.S., the internal consistency is 0.92, and test-retest reliability is 0.83.²⁷⁾ And the internal consistency of other countries is 0.85 for Turkey,⁵⁶⁾ 0.85 for Germany,⁵⁷⁾ and 0.88 for Portugal.⁵⁸⁾ Our study on the reliability of GAD-7 was also not much different from the results of other countries. Therefore, The GAD-7 is a reliable and efficient tool for screening for generalized anxiety disorders and assessing its severity in clinical practice and research.

6. Patient Health Questionnaire-15 (PHQ-15)

Somatization is one of the most common problems in medical and health care services, associated with substantial functional impairment and health care utilization. Somatization syndromes occur in 9.3% of the general population. Thus, validate acquisition of somatoform symptoms is necessary in several health care settings. The PHQ-15 is a good basis for this task. Normative data for the PHQ-15 in the general population were generated for both genders and different age levels and can be used for the interpretation and

comparisons with other populations.⁵⁰⁾ According to previous results, we expect that higher PHQ-15 scores will be associated with worsening quality of life and life satisfaction as well as with increased depression.⁵⁰⁾

The PHQ-15 questionnaire is being studied and translated into several languages, and looking at the study on the reliability of PHQ-15, translated into each language, the internal consistency was U.S. 0.80,¹⁹⁾ Hong Kong 0.79,⁵⁹⁾ Greece 0.71 to 0.73,⁶⁰⁾ Spain 0.78,⁶¹⁾ Netherlands 0.80,⁶²⁾ Germany 0.82,⁵⁰⁾ and 0.87 in other studies in Korea.⁶³⁾ Also looking at the previous study on PHQ-15 test-retest reliability, Hong Kong's results were stable and reliable,⁵⁹⁾ test-retest correlation coefficient the was 0.83 in Netherlands⁶²⁾ and 0.65 in other study in South Korea.⁶³⁾ Likewise, our results of Korean version of the PHQ-15 show a good internal consistency and a good to excellent test-retest reliability.

7. Oral Behaviors Checklist (OBC)

The Oral Behaviors Checklist (OBC), a self-report scale for identifying and quantifying the frequency of jaw overuse, is currently the recommended instrument for oral parafunctions evaluation,^{13, 30)} and the OBC is considered a TMD core risk factor assessment instrument.¹⁾ Previous study provides data useful in addressing the contention of whether oral parafunctional behaviors might be related to psychological stress with respect to the possible behaviors that might underlie the EMG measurements in the experimental psychophysiological studies.¹³⁾ In this study, Cronbach's alpha of OBC was 0.78 indicating a preferable internal consistency, and test-retest correlation coefficient was good reliable. However, the lowest item (0.47) was "Hold jaw in rigid or tense position, such as to brace or protect the jaw." that was considered a sentence that is difficult for

ordinary people to understand. Other language version of OBC showed good test-retest reliability that Portugal version was 0.99,³⁴⁾ Italy version was 0.87 to 0.95,⁶⁴⁾ and Netherland version was 0.86.⁶⁵⁾

In conclusion, the Korean version of the DC/TMD Axis II Questionnaires were found to be reliable instruments for the analysis of TMD and chronic orofacial pain symptoms. This study has provided a valid and reliable cross-culturally adapted instrument for TMD and orofacial pain researchers in Korea that will allow comparison with data from other international studies.

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Table 1. Summary of the DC/TMD Axis II Questionnaires Assessment

Questionnaire	No. of Questions	Assessment and Usefulness
GCPS	8	assessing pain intensity and pain-related disability
Pain Drawing	1	assessing the construct of wide-spread pain assessing masticatory limitation, vertical mobility
JFLS-20	20	limitation, and verbal and non-verbal communication limitation
PHQ-9	9	assessing depressed mood
GAD-7	7	assessing anxious mood and behavior
PHQ-15	15	assessing non-specific physical symptoms and somatization
OBC	21	assessing oral parafunctional behaviors

Abbreviations: GCPS, Graded Chronic Pain Scale; JFLS, Jaw Functional Limitation Scale; PHQ-9, Patient Health Questionnaire-9; GAD-7, Generalized Anxiety Disorder-7; PHQ-15, Patient Health Questionnaire-15; OBC, Oral Behaviors Checklist

Table 2. Demographic feature of the subjects by gender and age

Gender	Number participated	Age (mean±SD, range)
Men	60	37.8±11.9 (23 to 68 years)
Women	63	35.1±12.2 (20 to 64 years)
Total	123	36.4±12.1 (20 to 68 years)

Table 3. Intraclass coefficient of subscale of GCPS

Index of GCPS	ICC	95% CI	
		min	max
Characteristic Pain Intensity	0.91	0.87	0.94
Interference score	0.92	0.89	0.95
Points for Disability Days	0.92	0.89	0.94
Points for Interference Score	0.60	0.43	0.72
Total disability points	0.78	0.69	0.85

ICC: Intraclass coefficient

The total Disability Points = Points for Disability Days + Points for Interference Score

Table 4. Korean version GCPS test-retest correlation of each question of measured by Spearman's rho

Question of GCPS	Correlation coefficient
1. On how many days have you felt pain in the past 6 months?	0.85**
2. How would you rate your pain right now on a scale of 0 to 10, where 0 is “no pain” and 10 is “pain as bad as could be”?	0.67**
3. How intense was your worst pain in the past 3 months, rated on a scale of 0 to 10, where 0 is “no pain” and 10 is “pain as bad as could be”?	0.83**
4. On the average, how intense was your pain in the past 3 months, rated on a scale of 0 to 10, where 0 is “no pain” and 10 is “pain as bad as could be”?	0.76**
5. How many days has pain kept you from your usual activities, like working, attending school or doing housework, in the past 3 months?	0.61**
6. How much has pain interfered with your daily activities in the past 3 months, rated on a scale of 0 to 10, where 0 is “no interference” and 10 is “unable to carry on any activities”?	0.63**
7. How much has pain interfered in your recreational, social and family activities in the past 3 months, where 0 is “no interference” and 10 is “unable to carry on any activities”?	0.74**
8. How much has pain interfered in your ability to work, including housework, in the past 3 months, where 0 is “no interference” and 10 is “unable to carry on any activities”?	0.73**

** Correlation is significant at 0.01 significant level.

Table 5. Test-retest correlation of GCP scale

		Retest of GCP				
Grade		0	I	II	III	total
Test of GCP	0	67	8	0	0	75
	I	3	38	0	2	43
	II	0	1	0	2	3
	III	0	1	0	1	2
	total	70	48	0	5	123

Kappa value = 0.73**

Table 6. Intraclass coefficient of sub-scales of Korean version JFLS-20

Sub-scales of JFLS-20	ICC	95% CI	
		Min	Max
mastication	0.86	0.79	0.90
mobility	0.77	0.67	0.84
verbal	0.82	0.74	0.87
global	0.85	0.79	0.90

ICC: Intraclass coefficient

Table.7. Korean version JFLS-20 test-retest correlation coefficient of each question measured by Spearman's rho

For each of the items below, indicate the level of limitation during the past month.

Question of JFLS-20	Correlation coefficient
1. Chew tough food	0.74**
2. Chew hard bread	0.73**
3. Chew chicken (eg, prepared in oven)	0.66**
4. Chew crackers	0.61**
5. Chew soft food (eg, macaroni, canned or soft fruits, cooked vegetables, fish)	0.74**
6. Eat soft food requiring no chewing (eg, mashed potatoes, apple sauce, pudding, pureed food)	0.41**
7. Open wide enough to bite from a whole apple	0.79**
8. Open wide enough to bite into a sandwich	0.70**
9. Open wide enough to talk	0.52**
10. Open wide enough to drink from a cup	0.86**
11. Swallow	0.74**
12. Yawn	0.73**
13. Talk	0.73**
14. Sing	0.63**
15. Putting on a happy face	0.65**
16. Putting on an angry face	0.56**
17. Frown	0.60**

18. Kiss	0.71**
19. Smile	0.66**
20. laugh	0.71**

** Correlation is significant at 0.01 significant level.

Table 8. Korean version PHQ-9 test-retest correlation coefficient of each question measured by Spearman's rho

Over the last 2 weeks, how often have you been bothered by any of the following problems?

Question of PHQ-9	Correlation coefficient
1. Little interest or pleasure in doing things...	0.63**
2. Feeling down, depressed, or hopeless...	0.64**
3. Trouble falling or staying asleep, or sleeping too much...	0.79**
4. Feeling tired or having little energy...	0.74**
5. Poor appetite or overeating...	0.83**
6. Feeling bad about yourself - or that you are a failure or have let yourself or your family down...	0.73**
7. Trouble concentrating on things, such as reading the newspaper or watching television...	0.64**
8. Moving or speaking so slowly that other people could have noticed? Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual...	0.64**
9. Thoughts that you would be better off dead or of hurting yourself in some way...	0.78**
If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?	0.61**

** Correlation is significant at 0.01 significant level.

Table 9. Test-retest reliability of depression severity using PHQ-9

		Retest grade				total
		normal	mild	moderate	severe	
Test grade	normal	58	4	0	0	62
	mild	13	24	4	1	42
	moderate	2	4	8	2	16
	moderately	0	1	0	1	2
	severe	1	0	0	0	1
	total	74	33	12	4	123

Kappa value=0.56**

Table 10. Intraclass coefficient of total score of the Korean version GAD-7 and extra-
Question

	ICC	95% CI	
		Min	Max
Total score of GAD-7	0.89	0.84	0.92
Extra-question	0.82	0.75	0.88

ICC: Intraclass coefficient

Table.11. The Korean version GAD-7 test-retest correlation coefficient of each question measured by Spearman's rho

Over the last 2 weeks, how often have you been bothered by the following problems?

Question of GAD-7	correlation coefficient
1. Feeling nervous, anxious or on edge	0.71**
2. Not being able to stop or control worrying	0.72**
3. Worrying too much about different things	0.67**
4. Trouble relaxing	0.67**
5. Being so restless that it is hard to sit still	0.72**
6. Becoming easily annoyed or irritable	0.66**
7. Feeling afraid as if something awful might happen	0.75**
(Extra-question) If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?	0.72**

** Correlation is significant at 0.01 significant level.

Table 12. Test-retest correlation of somatic symptom severity (total score of PHQ-15)

		Retest Grade				total
		minimal	low	medium	high	
Test Grade	minimal	59	11	0	0	70
	low	9	31	1	0	41
	medium	0	5	5	0	10
	high	0	0	0	2	2
total		68	47	6	2	123

Kappa value = 0.62**

Table 13. The Korean version PHQ-15 test-retest correlation coefficient of each question measured by Spearman's rho

During the past 4 weeks, how much have you been bothered by any of the following problems?

Question of PHQ-15	correlation coefficient
1. Stomach pain	0.66**
2. Back pain	0.82**
3. Pain in your arms, legs, or joints (knees, hips, etc.)	0.62**
4. Menstrual cramps or other problems with your periods [Women only]	0.71**
5. Headaches	0.60**
6. Chest pain	0.74**
7. Dizziness	0.79**
8. Fainting spells	0.70**
9. Feeling your heart pound or race	0.63**
10. Shortness of breath	0.67**
11. Pain or problems during sexual intercourse	1.00**
12. Constipation, loose bowels, or diarrhea	0.61**
13. Nausea, gas, or indigestion	0.60**
14. Feeling tired or having low energy	0.70**
15. Trouble sleeping	0.71**

** Correlation is significant at 0.01 significant level.

Table 14. The Korean version OBC test-retest correlation coefficient of each question measured by Spearman's rho

Question of OBC	correlation coefficient
1. Clench or grind teeth when asleep, based on any information you may have.	0.87**
2. Sleep in a position that puts pressure on the jaw (for example, on stomach, on the side)	0.75**
3. Grind teeth together during waking hours	0.58**
4. Clench teeth together during waking hours	0.70**
5. Press, touch, or hold teeth together other than while eating (that is, contact between upper and lower teeth)	0.62**
6. Hold, tighten, or tense muscles without clenching or bringing teeth together	0.58**
7. Hold or jut jaw forward or to the side	0.49**
8. Press tongue forcibly against teeth	0.62**
9. Place tongue between teeth	0.61**
10. Bite, chew, or play with your tongue, cheeks or lips	0.75**
11. Hold jaw in rigid or tense position, such as to brace or protect the jaw.	0.47**
12. Hold between the teeth or bite objects such as hair, pipe, pencil, pens, fingers, fingernails, etc.	0.80**
13. Use chewing gum	0.77**
14. Play musical instrument that involves use of mouth or jaw (for example, woodwind, brass, string instruments)	0.84**
15. Lean with your hand on the jaw, such as cupping or resting the chin in the hand.	0.72**

16. Chew food on one side only	0.77**
17. Eating between meals (that is, food that requires chewing)	0.71**
18. Sustained talking (for example, teaching, sales, customer service)	0.72**
19. Singing	0.68**
20. Yawning	0.63**
21. Hold telephone between your head and shoulders	0.68**
Total	0.82**

** Correlation is significant at 0.01 significant level.

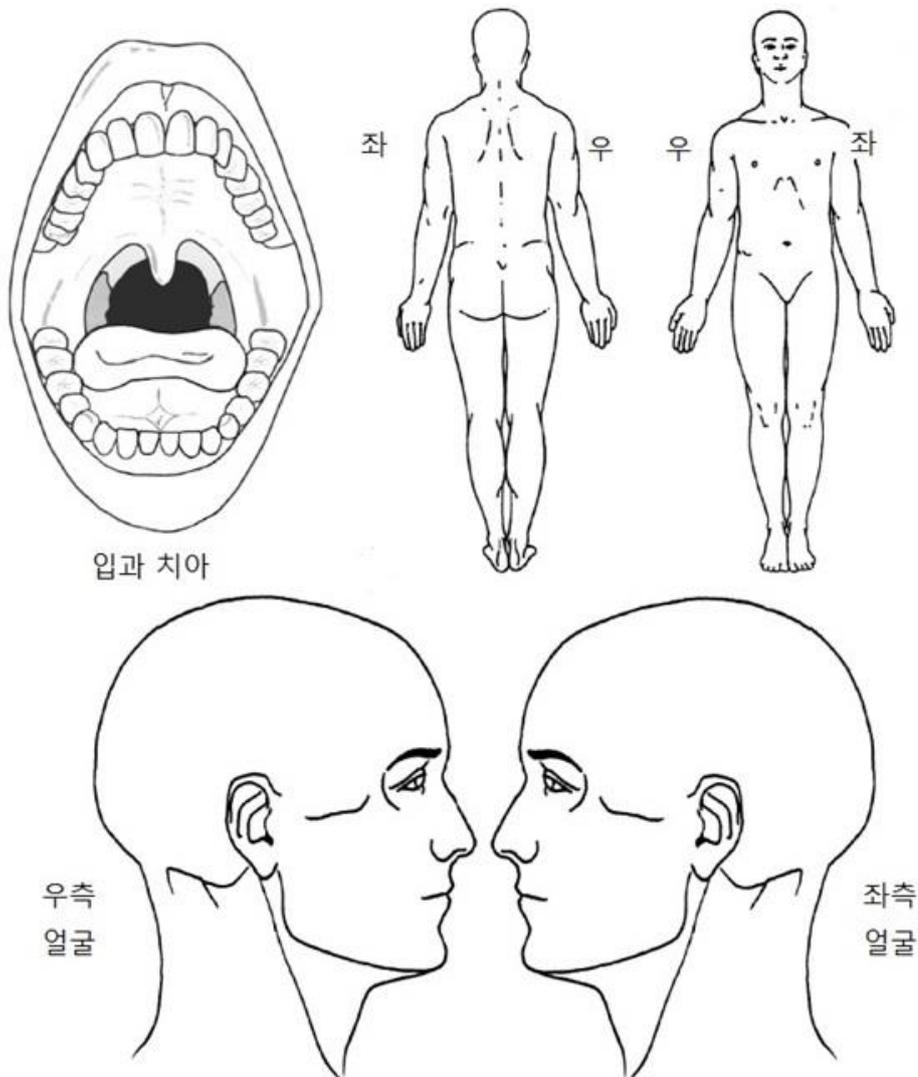
Appendix 1.

만성통증 등급 척도 (Graded Chronic Pain Scale) 2 판	
1. 지난 6개월간 얼굴부위 통증을 며칠간 느꼈습니까?	_____ 일
2. 지금 현재 당신의 얼굴 부위 통증은 어느 정도입니까? 0부터 10까지의 척도를 사용하여 나타내 주십시오. 0은 "통증 없음" 이고 10은 "가능한 심한 통증"입니다.	
통증이 없다	가능한 최고의 통증
3. 지난 30일 동안 , 당신이 느낀 가장 최고의 얼굴부위 통증은 어느 정도입니까? 동일한 척도를 사용하여 주십시오. 0은 "통증 없음" 이고 10은 "가능한 최고로 심한 통증"입니다.	
통증이 없다	가능한 최고의 통증
4. 지난 30일 동안 , 평균적으로 , 당신의 얼굴부위 통증은 몇 점입니까? 0부터 10까지의 동일한 척도를 사용하여 나타내 주십시오. 0은 "통증 없음" 이고 10은 "가능한 심한 통증"입니다. [즉, 당신이 통증이 있을 때 느끼는 일반적인 통증 정도]	
통증이 없다	가능한 최고의 통증
5. 지난 30일 동안 , 얼굴부위 통증으로 인해 직장, 학교, 집안일 등의 일상적 활동 을 하지 못한 것은 며칠입니까?	_____ 일
6. 지난 30일 동안 , 얼굴부위 통증이 당신의 일상생활 을 얼마나 심하게 방해했습니까? 0부터 10까지의 동일한 척도를 동일한 척도를 사용하여 나타내 주십시오. 즉 0은 "지장을 주지 않았다", 10은 어떤 일도 할 수 없었다"로 표현하신다면, 어느 정도입니까?	
방해 받지 않음	어떤 활동도 할 수 없음
7. 지난 30일 동안 , 얼굴부위 통증이 당신의 여가생활, 사회생활, 가족 활동 을 얼마나 심하게 방해했습니까? 0부터 10까지의 동일한 척도를 사용하여 나타내 주십시오. 즉 0은 "지장을 주지 않았다", 10은 어떤 일도 할 수 없었다"로 표현하신다면, 어느 정도입니까?	
방해 받지 않음	어떤 활동도 할 수 없음
8. 지난 30일 동안 , 얼굴 부위 통증으로 인해 집안일을 포함하여 일을 할 수 있는 능력 이 얼마나 방해 받았습니까? 0부터 10까지의 동일한 척도를 사용하여 나타내 주십시오. 즉 0은 "지장을 주지 않았다", 10은 어떤 일도 할 수 없었다"로 표현하신다면, 어느 정도입니까?	
방해 받지 않음	어떤 활동도 할 수 없음

Appendix 2.

통증 부위 그리기

가장 연관되는 그림을 사용하여 당신이 느끼는 **모든** 통증 위치를 색칠하여 표시하십시오. 통증의 위치가 정확한 부위라면, 속을 채운 점 (●)으로 표시하십시오. 통증이 한 위치에서 다른 위치로 움직이면 화살표들로 그 경로를 표시하십시오.



Appendix 3.

하악 기능 제한 척도 (Jaw Functional Limitation Scale)-20	
다음의 각각의 항목에 대해 <u>지난 한달 동안</u> 제한된 정도를 표시하십시오. 그 활동이 너무 어려워서 전혀 할 수 없었다면 10에 표시하시고, 통증 또는 어려움 이외의 다른 이유에서 그 활동을 피한다면 그 항목은 비워두십시오.	
	제한 없음
	심각한 제한
1. 질긴 음식 씹기	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
2. 딱딱한 빵 씹기	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
3. 닭고기 씹기 (예를 들어, 오븐에 구운 것)	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
4. 과자 씹기	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
5. 부드러운 음식 씹기 (예를 들어, 마카로니, 통조림 또는 연한 과일, 조리된 야채, 생선)	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
6. 씹을 필요가 없는 부드러운 음식을 먹는 것 (예를 들어, 으깬 감자, 사과 소스, 푸딩, 갈아 만든 음식)	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
7. 사과를 통째로 베어물 만큼 입을 벌리는 것	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
8. 샌드위치를 베어물 만큼 입을 벌리는 것	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
9. 말할 정도로 입을 벌리는 것	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
10. 컵으로 물을 마실 수 있을 정도로 입을 벌리는 것	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
11. 삼키기	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
12. 하품 하기	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
13. 말하기	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
14. 노래하기	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
15. 행복한 표정 짓기	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
16. 화난 표정 짓기	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
17. 얼굴을 찌푸리기	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
18. 키스하기	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
19. 미소 짓기	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10
20. 웃기	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10

Appendix 4.

환자 건강 설문지 (Patient Health Questionnaire)- 9				
지난 2주 동안, 다음의 문제로 얼마나 신경이 쓰였습니까? 상자에 체크로 표시하여 답하여 주십시오.				
	전혀 아니다(0)	며칠(1)	날들의 반 이상(2)	거의 매일(3)
1. 무엇인가를 하는데 있어 즐거움이나 흥미가 거의 없음	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. 기분이 슬프거나 우울하거나, 희망이 없음	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. 잠들기 또는 잠자는 상태를 유지하기 어렵거나, 너무 많이 잔다.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. 피곤하거나 에너지가 별로 없다.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. 식욕이 떨어지거나 과식한다	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. 스스로에 대해 좋지 않게 생각되거나 자신이 실패자라는 생각이 들거나 자신이나 가족을 실망시켰다는 생각이 든다.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. 예를 들어 신문을 읽거나 텔레비전을 보는 것과 같은 일에 집중하는 것이 어렵다.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. 다른 사람들이 알아차릴 정도로 느리게 움직이거나 말한다. 혹은 반대로 가만히 있지 못하고 평상 시 보다 더 많이 움직인다.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. 자신이 죽어버리거나 스스로를 다치게 하는 것이 낫다고 생각한다.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
전체점수				
어떠한 문제라도 체크 했다면, 이러한 문제들이 당신이 일하거나, 집안일 하거나, 다른 사람과 어울릴 때 얼마나 어려움을 줍니까?				
<input type="checkbox"/> 전혀 어렵지 않다 <input type="checkbox"/> 다소 어렵다 <input type="checkbox"/> 매우 어렵다 <input type="checkbox"/> 극히 심하게 어렵다				

Appendix 5.

GAD - 7				
지난 2주 동안, 다음의 문제로 얼마나 방해를 받았습니까? 상자에 체크로 표시하여 답하여 주십시오.				
	전혀 아니다(0)	며칠(1)	날들의 반 이상(2)	거의 매일(3)
1. 긴장되거나, 불안하거나, 초조함	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. 걱정을 조절하거나 멈출 수 없음	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. 다양한 일에 관하여 너무 많이 걱정함	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. 긴장을 푸는 것이 어려움	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. 안절부절못해서 가만히 앉아있기 힘들	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. 쉽게 짜증이 나거나 화가 남.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. 무언가 안 좋은 일이 일어날 것 같아 두려움	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
전체점수				
어떠한 문제라도 체크 했다면, 이러한 문제들이 당신이 일하거나, 집안일 하거나, 다른 사람과 어울릴 때 얼마나 어려움을 줍니까?				
<input type="checkbox"/> 전혀 어렵지 않다 <input type="checkbox"/> 다소 어렵다 <input type="checkbox"/> 매우 어렵다 <input type="checkbox"/> 극히 심하게 어렵다				

Appendix 6.

환자 건강 설문지 (Patient Health Questionnaire)- 15: 신체 증상 (Physical Symptoms)			
지난 4주 동안, 다음의 문제로 얼마나 얼마나 심하게 신경이 쓰였습니까? 체크로 표시하여 답하여 주십시오.			
	방해받지 않음(0)	조금 방해 받음(1)	많이 방해 받음(2)
1. 복통	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. 요통	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. 팔, 다리, 관절 (무릎, 엉덩이 등)의 통증	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. 생리통, 혹은 생리에 의한 다른 문제 [여성만]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. 두통	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. 흉통	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. 어지러움	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. 실신	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. 심장이 강하게 뛰거나 빨리 뛴	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. 숨이 가쁨	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. 성형위시 통증 또는 문제	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. 변비나 묽은변 혹은 설사	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. 메스꺼움, 방귀, 혹은 소화불량	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. 피곤하거나 에너지가 별로 없다.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. 수면에 문제가 있다.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
전체점수			

Appendix 7.

등록번호 :	환자성명 :	성별/나이 :	생년월일 :		
구강 행동 체크리스트 (Oral Behavior Checklist)					
지난 달 동안 다음의 활동을 얼마나 자주 하셨습니까? 활동의 빈도가 다양하면, 더 높은 것을 선택 하십시오. 각각의 항목에 (v) 표시하시고, 항목을 건너뛰지 마십시오.					
수면 동안의 활동	없음	한달에 한번 미만	한달에 1-3일 밤	한주에 1-3 밤	한주에 4-7 밤
1. 당신이 아는 정보를 바탕으로 잘 때 치아를 꼭 물거나 이를 간다	<input type="checkbox"/>				
2. 턱에 압력을 가하는 자세로 잔다 (예를들어, 엎드리거나, 누워서)	<input type="checkbox"/>				
깨어 있는 동안의 활동	없음	조금의 시간 동안 한다	일부의 시간 동안 한다	대부분의 시간 동안 한다	항상한다
3. 깨어 있는 동안 이를 간다.	<input type="checkbox"/>				
4. 깨어 있는 동안 이를 꼭 물고 있다.	<input type="checkbox"/>				
5. 식사 시간 이외에 위 아래 이를 다물어 압력을 가하거나, 붙이고 있거나 맞닿게하고 있다 (즉, 위 아래 치아가 닿아 있다).	<input type="checkbox"/>				
6. 이를 꼭 물거나 붙이고 있지 않은 상태 에서 근육들을 유지하거나 긴장시키거나 힘을 주고 있다.	<input type="checkbox"/>				
7. 턱을 앞으로 혹은 한쪽 옆으로 내밀거나 유지시킨다.	<input type="checkbox"/>				
8. 혀를 치아에 대고 민다.	<input type="checkbox"/>				
9. 혀를 치아 사이에 둔다.	<input type="checkbox"/>				
10. 혀, 볼, 입술을 깨물거나 씹거나 가지고 논다.	<input type="checkbox"/>				
11. 턱을 지지하거나 보호하기 위하여 경직 되거나 긴장된 위치에 턱을 유지한다.	<input type="checkbox"/>				
12. 머리카락, 파이프, 연필, 펜, 손가락, 손톱 등의 물건을 문다.	<input type="checkbox"/>				
13. 껌을 씹는다.	<input type="checkbox"/>				
14. 입이나 턱을 사용하는 악기를 연주한다 (예, 목관악기, 금관악기, 현악기)	<input type="checkbox"/>				
15. 턱을 손으로 괴거나 감싸는 것과 같이 턱에 손을 대고 기댄다.	<input type="checkbox"/>				
16. 한쪽으로만 씹는다.	<input type="checkbox"/>				
17. 간식을 먹는다 (씹을 필요가 있는 음식에 해당)	<input type="checkbox"/>				
18. 말을 지속적으로 한다 (예를 들어, 가르치 거나, 판매업에 종사하거나, 고객 관리 서비스)	<input type="checkbox"/>				
19. 노래를 부른다.	<input type="checkbox"/>				
20. 하품을 한다.	<input type="checkbox"/>				
21. 전화기를 머리와 어깨사이에 끼우고 사용한다.	<input type="checkbox"/>				
총점					

국문초록

한국어판 측두하악장애 진단기준 (DC/TMD) Axis II 설문지의 신뢰도에 관한 연구

서울대학교 대학원 치의학과 구강내과 · 진단학 전공

(지도교수 정진우)

손병진

1. 목적

측두하악장애는 턱관절 및 관련 조직의 만성 통증뿐만 아니라 기능 장애를 유발하는 근골격계 질환으로 측두하악장애 환자의 정확한 평가를 위하여는 신체적 진단 뿐만 아니라 행동 및 정신사회적 요인에 대한 평가가 포함되어야 한다. 측두하악장애 진단기준 (DC/TMD)은 Axis I의 신체적 진단 뿐만 아니라 예후에 영향을 미칠 수 있는 행동 및 정신사회적 요인에 관한 Axis II 평가를 포함하며, Axis II 설문지는 문화적 및 사회인구학적 차이로 인하여 각 나라의 언어로 번역 시 원본 버전 사용의 유용성이 제한될 가능성이 있다. 본 연구의 목적은 측두하악장애 진단기준 Axis II 설문지를 한국어판으로 번역하고, 한국어판 측두하악장애 진단기준의 신뢰성과 타당성을 평가하는데 있다.

2. 방법

한국어판 측두하악장애 진단기준 Axis II 설문지의 신뢰도를 분석하기 위하여 모집 공고를 보고 지원한 123명 (남자 60명, 여자 63명)을 대상으로 설문지를 작성하게 하였다. 검사-재검사 신뢰도를 평가하기 위해서 동일한 대상자에게 1주 내지 2주 간격으로 같은 설문지를 작성하도록 하였으며, 턱관절 부위의 통증을 가진 대상자의 경우 설문지의 검사-재검사가 완료되기 전까지는 어떠한 치료도 제공되지 않았다.

3. 결과

만성통증척도(Graded Chronic Pain Scale), 하악기능제한 척도(Jaw Function Limitation Score), 환자 건강 설문지(Patient Health Questionnaire-9), 일반불안장애(Generalized Anxiety Disorder-7), 환자 신체증상 설문지(Patient Health Questionnaire-15), 구강행동 체크리스트(Oral Behavioral Checklist)의 내적 일관성(internal consistency)은 크론바흐-알파(Cronbach's alpha) 계수로 각각 0.89, 0.90, 0.68, 0.92, 0.72 및 0.78으로 각각의 설문지들이 좋은 내적일치도를 보였다. 검사-재검사 신뢰도의 각 설문 문항별 상관계수는 0.41에서 1.00까지의 범위로 좋은 상관관계를 나타냈으며, 각각의 설문지의 세부 하위척도의 급내상관계수 (Intraclass correlation coefficient; ICC)는 0.50에서 0.92의 범위로 좋은 신뢰성을 보여주었다.

한국어판 측두하악장애 진단기준 Axis II 설문지는 좋은 내적일치도 및 검사-재검사 신뢰도를 보였으며, 한국인의 측두하악장애 환자들에서 심리사회적 및 행동적 측면을 분석하는데 유용하게 사용될 수 있다.

주요어 : 측두하악장애 진단기준(DC/TMD), 설문지, 내적 일관성, 검사-재검사, 신뢰도

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