

## Reliability of the Korean Version of Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD)

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**Objectives:** The aim of this study was to analyze the reliability of the Korean language version of the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) axis II questionnaire among TMD patients.

**Methods:** The Korean version of the RDC/TMD questionnaire was distributed to 154 TMD patients (31 men, 123 women) who visited Seoul National University Dental Hospital. The test-retest reliability was also assessed among the same subjects with a one- or two-week time interval. The subjects did not receive any form of therapy until the retest administration was completed.

**Results:** The internal consistency reliability of pain intensity, disability score, jaw disability, and psychosocial status were 0.92, 0.94, 0.68, and 0.94, respectively using the Cronbach's alpha coefficient of the 1st test. Test-retest reliability coefficients of each items of the questionnaire ranged from 0.40 to 0.94 assessed with kappa value, and the intra-class correlation coefficient (ICC) for each subscale ranged from 0.81 to 0.93. Test-retest reliability coefficient of the graded chronic pain (GCP) scale was 0.63.

**Conclusions:** The Korean language version of RDC/TMD axis II questionnaire demonstrated good reliability. It can be used as a valuable instrument for the analyses of the psychosocial aspects of the TMD patients in Korea.

**Key words:** RDC/TMD, Questionnaire, Test-retest, Internal consistency, Reliability

### I. INTRODUCTION

Temporomandibular disorders (TMD) encompass a range of commonly occurring orofacial conditions that compromise the comfort and healthy functioning

of the hard and soft tissues of the masticatory system.<sup>1-3)</sup> The prime manifestations of these disorders are described as acute or chronic pain in the area of the TMJ and/or masticatory muscles, limitations or deviations in range of mandibular motion, TMJ clicking and/or crepitus sounds during mandibular function.<sup>3,4)</sup>

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Further complicating the diagnosis of TMD is the presence of negative or maladaptive behavioral, emotional, and psychosocial factors, which have been extensively documented in patients with TMD.<sup>5)</sup> There is a widespread agreement that chronic pain involves psychological, behavioral, and social factors in addition to physical pathology, so for the complete assessment of TMD the evaluation

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of biobehavioral factors should generally be included.<sup>6)</sup> However, there have been few systematic attempts to integrate behavioral, emotional, and psychosocial findings into a coherent diagnostic or assessment scheme for TMD.<sup>7)</sup>

As an initial step to redress these shortcomings, Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) has recently been developed and made available to researchers and clinicians for scientific evaluation.<sup>8,9)</sup> The RDC/TMD contains clinical examination and history-gathering methods, and comprises a dual axis system for diagnosing and classifying TMD patients. Axis I assigns physical diagnoses: Group I, Muscle Disorders; Group II, TMJ Disc Displacements; and Group III, Arthralgia, Arthritis, and arthroses of the TMJ.<sup>8,9)</sup> Axis II is used to assess behavioral, psychological, and psychosocial factors which can affect the prognosis of TMD or can be the results from chronic orofacial pain.<sup>10-14)</sup> The axis II profile consists of several components derived from self-reported ratings on Likert scales and endorsement of symptoms or limitations on categorical scales. The profile measures perceived pain intensity, pain-related disability, resulting limitations, depression, and nonspecific physical symptoms suggesting somatization tendencies. The RDC/TMD criteria for both axes I and II have been used in numerous clinical research studies to characterize the physical, psychological, and psychosocial factors associated with TMD as well as to elucidate the relationship among these factors. The RDC/TMD has been suggested as a model system for the diagnosis and assessment of all chronic pain conditions.<sup>8-12)</sup>

In addition, translations of the RDC/TMD, in whole or in part, have been created and used in clinical studies as Dutch, Finnish, French, German, Hebrew, Japanese, Spanish, Swedish, Chinese, Danish, Italian, Portuguese, Romanian, and Korean versions.<sup>15)</sup>

The reliability of RDC/TMD axis II was also studied by Dworkin *et al.*<sup>16)</sup> They proved the reliability, validity, and clinical utility of the

RDC/TMD axis II scales: depression, somatization, and Graded Chronic Pain. However, the test-retest reliability was not validated, and only the reliability of internal consistency using Cronbach's alpha based on a single test was described.

Cultural and sociodemographic differences limit the usefulness of the original version of RDC/TMD around the world. Therefore there is a need to translate the original RDC/TMD into Korean language to assess TMD in the local population for multicenter comparison. The present study was carried out with the aim of translating the RDC/TMD into the Korean language and assessing its reliability and validity in the Korean people.

## II. MATERIALS AND METHODS

### 1. Subjects

The subjects were the consecutive patients who visited the Orofacial Pain Clinic, Department of Oral Medicine in Seoul National University Dental Hospital with the complaint of TMD pain, from November, 2002 to September, 2003. The number of subjects was 154 (men: 31, women: 123) and age ranged from 15 to 63 years. Table 1 shows the demographic distribution of the subjects by gender and age.

### 2. RDC/TMD axis II questionnaire

The RDC/TMD axis II questionnaire consisted of 31 questions covering information devoted to demographics and psychosocial assessment. The

Table 1. Demographic features of the subjects by gender and age

Gender	Number participated	Age (mean±SD, range)
Men	31	24.3±8.7 (15-53 yrs)
Woman	123	26.1±7.6 (15-63 yrs)
Total	154	25.7±7.9 (15-63 yrs)

parameters of psychological profiles including depression, somatization (including or excluding pain items), jaw disability, pain intensity, disability days, disability score, and Graded Chronic Pain scale were analyzed. Method of assessing depression and somatization was derived from Symptom Checklist-90-Revision (SCL-90-R). Participants responded to 13 items of depression parameter and 7 items of an additional parameter of the SCL-90-R, and then resultant raw mean score was regarded as depression scale. Somatization scale was also obtained by raw mean score from the responses to 12 items of non-specific physical symptoms of SCL-90-R.

Jaw disability scale was gained from the ratio of the numbers of positively responded items to 12 items of the jaw disability checklist based on items commonly used in clinical TMD research.

The RDC/TMD axis II questionnaire includes three questions to pain intensity of Graded Chronic Pain scale: one for the actual pain, one for maximal pain in the last 6 months, and one for average pain in the last 6 months. The response options for each of the three items were based on the ordinal rating of 0 to 10 scales. To obtain the final score, we multiplied the average of the responses to each item by 10. Therefore pain intensity is expressed in a 0 to 100 score derived from the above three questions. The number of disability days was used to assess the days with pain during the previous 6 months.

Graded chronic pain scale was classified to five stages (0=no TMD pain in the prior 6 months; I=low intensity-low disability; II=high intensity-low disability; III=high intensity-high disability-moderately limiting; IV=high intensity-high disability-severely limiting). According to the severity of chronic pain symptoms derived from the pain intensity and disability point which is summed by adding disability score point to disability days score point. Grade I and II are defined as low a disability group, and grade III and IV are defined as a high disability group.

### 3. Korean translation

The original English version of the RDC/TMD questionnaire was translated into Korean by the authors for the first time. This translation was evaluated and revised by several faculty members in the Department of Oral Medicine and Oral Diagnosis, Seoul National University. The draft Korean version was then translated back into English by a native English speaker who was also fluent in Korean. The backward translated English version was compared with the original English version to check whether the questions were properly translated. This was to ensure that the translated version reflected the same content as the original version. The final Korean version was completed through this process. The full translation of the Korean version of the RDC/TMD questionnaire is shown in the appendix of the manuscript.

### 4. Data collection and interval of the test

On the first visit of the patient, an examiner who was a dentist specialized in TMD and orofacial pain, told them brief information for the Korean version of RDC/TMD axis II questionnaire and the patients completed the questionnaire. One or two weeks later, on the second visit of the patients, the questionnaire was drawn up once again using the simple blind technique. During this interval, no one received any treatment for their TMD pain. The one or two week interval was selected as a period short enough to eliminate the likelihood of significant changes in the subject's TMD symptoms taking place, but long enough to ensure that subjects could not recall their responses to the first questionnaire.<sup>17)</sup>

### 5. Statistical analysis

Internal consistency was measured using Cronbach's alpha for each subgroup.<sup>18,19)</sup> This method has the advantage of the alpha coefficient being calculated through only one test. Figures in the range of 0.7-0.9 are preferable even though

values as low as 0.6 may be acceptable. Test-retest reliability was assessed using a kappa index and intraclass coefficients (ICCs) were used alternatively. 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. These statistical analyses were completed by SPSS (version 11.0).

### III. RESULTS

#### 1. Internal consistency

Internal consistency was considered in axis II-related questions and physical characteristics items since clinical examinations of the TMJ had already been performed. Axis I-related items only provide information concerning the physical status of the patients.

Internal consistency of the physical characteristics

is 0.64 and 0.59 assessed with Cronbach's alpha indicating acceptable reliability. The internal consistencies of axis II-related subscales were 0.92, 0.94, 0.68, 0.94, 0.89, and 0.83 for pain intensity, disability score, jaw disability, depression, somatization including pain, somatization excluding pain items, respectively. The items reflecting the psychosocial status related to depression and somatization showed 0.96. Table 2 shows the internal consistency of each subscale.

#### 2. Test-retest reliability

Test-retest reliability of all questions and their sub-questions ranged from 0.40 to 0.94 analyzed with kappa value (Table 3). Test-retest reliability of each subscale measured by intraclass coefficients (ICC) were 0.85, 0.93, 0.88, 0.81, 0.92, 0.88, and 0.86; pain intensity, disability days, disability score, jaw disability, depression, somatization including pain, and somatization excluding pain items, respectively (Table 4).

Table 2. Internal consistency of each item

Categories	Question	Internal consistency (Cronbach's alpha)
Physical characteristics	Q1,2,21,22	0.64
	Q1,2,15-e,f,g,21,22	0.59
Axis II	Q7,8,9 Pain intensity	0.92
	Q11,12,13 Disability score	0.94
	Jaw disability Q19 : 12 items	0.68
	Psychosocial status Q20 : 32 items	0.96
	Depression Q20 : 20 items	0.94
	Somatization including pain Q20 : 12 items	0.89
	Somatization excluding pain Q20 : 7 items	0.83

Table 3. Test-retest reliability of each question measured by kappa

Question number	Kappa	Question number	Kappa
Q1	0.69	Q20-e	0.52
Q2	0.68	Q20-f	0.46
Q3	0.91	Q20-g	0.48
Q14-a	0.69	Q20-h	0.56
Q14-b	0.51	Q20-i	0.41
Q15-a	0.47	Q20-j	0.51
Q15-b	0.54	Q20-k	0.52
Q15-c	0.83	Q20-l	0.53
Q15-d	0.61	Q20-m	0.44
Q15-e	0.52	Q20-n	0.44
Q15-f	0.75	Q20-o	0.54
Q15-g	0.48	Q20-p	0.46
Q16-a	0.70	Q20-q	0.53
Q16-b	0.75	Q20-r	0.60
Q16-c	0.76	Q20-s	0.42
Q16-d	0.81	Q20-t	0.51
Q17-a	0.75	Q20-u	0.49
Q17-b	0.86	Q20-v	0.47
Q18	0.72	Q20-w	0.48
Q19-a	0.54	Q20-x	0.47
Q19-b	0.71	Q20-y	0.58
Q19-c	0.82	Q20-z	0.48
Q19-d	0.70	Q20-aa	0.46
Q19-e	0.40	Q20-bb	0.54
Q19-f	0.74	Q20-cc	0.40
Q19-g	0.81	Q20-dd	0.45
Q19-h	0.62	Q20-ee	0.51
Q19-i	0.71	Q20-ff	0.54
Q19-j	0.40	Q21	0.63
Q19-k	0.71	Q22	0.61
Q19-l	0.56	Q28-a	0.90
Q20-a	0.50	Q28-b	0.84
Q20-b	0.66	Q28-c	0.70
Q20-c	0.41	Q29	0.94
Q20-d	0.53		

Kappa value: 0-0.2, no reliability; 0.2-0.4, poor reliability; 0.4-0.6, fair reliability; 0.6-0.8, good reliability; 0.8-1.0, excellent reliability.

Table 4. Test-retest reliability measured by intraclass coefficients (ICC) of each item

Item	Question number	ICC	Range (95% CI)
Pain intensity	(Q7+Q8+Q9)/3*10	0.85	0.80-0.89
Disability days	Q10	0.93	0.91-0.95
Disability score	(Q11+Q12+Q13)/3*10	0.89	0.84-0.92
Depression	Q20 sum of 20 items	0.92	0.89-0.94
Somatization including pain items	Q20 sum of 12 items	0.88	0.84-0.91
Somatization excluding pain items	Q20 sum of 7 items	0.86	0.82-0.90

### 3. Reliability of Graded Chronic Pain scale

Graded Chronic Pain (GCP) scale was obtained from pain intensity, disability days, and disability score. The GCP scale was also used to evaluate the physical status of the patients. The test-retest reliability of GCP scale was 0.63 measured by kappa statistics (Table 5).

### 4. Correlations among RDC/TMD axis II profiles

Table 6 shows the correlations among RDC/TMD axis II profiles. All the psychological profiles including depression and somatization showed significantly high correlations.

The GCP scale and jaw disability score also showed modest correlations with psychological profiles.

### IV. DISCUSSION

The Korean version of RDC/TMD axis II Questionnaire showed good internal consistency and test-retest reliability. Internal consistency of the axis II-related subscales were above 0.70 except for jaw disability that showed a value nearby 0.70 (alpha=0.68) which indicates adequate reliability.<sup>20)</sup> The reason for this lower value for jaw disability may be found in the cultural difference of the Korean people that find it unnatural to smile/laugh (19-f) occasionally and make facial expressions (19-l), causing potential difficulties in understanding the exact meaning of the question. Compared with US data,<sup>15)</sup> the value for depression (alpha=0.94) is greater (0.91-0.93), and somatization (0.83, 0.89) is alike or higher than US results (0.78-0.87) accentuating the fact that the translation was successful and cross-cultural adaptation accomplished.

Table 5. Test-retest correlation of Graded Chronic Pain (GCP) scale

	Re-test of GCP					
	0	I	II	III	IV	Total
0		1				1
I	1	40	4	3	1	49
II		6	7	2		15
III		4	4	34	5	47
IV		1		7	28	36
Total	1	52	15	46	34	148

Kappa = 0.63

Table 6. Pearson's correlations among RDC/TMD axis II profiles

	Depression	Jaw disability	Somatization including pain items	Somatization excluding pain items
GCP	0.351**	0.404**	0.344**	0.322**
Depression		0.359**	0.772**	0.774**
Jaw disability			0.350**	0.346**
Somatization including pain items				0.965**

\*\* : significant at 0.01 level (2-tailed)

We analyzed 24 items excluding seven items which demonstrated age, gender, ethnicity, level of education, income level, and ancestors of the study population. The age and gender of the patients were confirmed by their dental charts. The mean age of the patients was 25.7 years, with the greater part of the subject group composed of students who did not earn money and did not know their family income, exactly. In addition, the questions about ethnicity and their ancestors were excluded since the Korean people are composed of a single race.

The reliability of RDC/TMD axis I had already been proved in past studies. Dworkin *et al.* demonstrated the reliability of assessing clinical signs of TMD, later these reliable methods were under consideration for developing RDC/TMD axis I.<sup>12)</sup> Several previous studies have demonstrated that the Axis I component of the RDC/TMD is associated with acceptable to high levels of reliability when the clinical examination is performed as specified.<sup>11,15)</sup>

The test-retest reliability of the Korean version of RDC/TMD Axis II questionnaire indicated good to excellent reliable. The Kohen's Kappa of all the items was above 0.4, ranging from 0.40 to 0.94 indicating fair to excellent reliabilities.<sup>21,22)</sup> The number of items showing 'fair' reliability (k: 0.4-0.6) was 40, and that of 'good' reliability (k: 0.6-0.8) was 18. The other 9 items showed 'excellent' reliability (k: 0.8-1.0). The test-retest reliability of each subscale using intraclass coefficients (ICC) was greater than 0.75 which may

be considered very acceptable.<sup>13,23)</sup> Finally, the test-retest reliability of GCP was good. There is a need to re-evaluate the items that show rather low test-retest reliability and replace the phrases to ones that cause less confusion and are more appropriate to reflect the cultural belief of the Korean people concerning pain behavior.

Recently, the RDC/TMD has been used in the numerous clinical researches regarding the physical, psychological, and psychosocial factors of TMD and the relationships among these factors. The RDC/TMD questionnaire has been translated into over 20 languages, and these translations can be obtained in the RDC/TMD consortium website (<http://rdc-tmdinternational.org>). For more reliable and effective international collaboration studies, further development to reduce cultural and sociodemographic differences is imperative.

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

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국문요약

## 한국어판 측두하악장애 연구진단기준 (RDC/TMD) 설문지의 신뢰도에 관한 연구

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손병진 · 박민우 · 박지운 · 정성창 · 정진우

한국어판 측두하악장애 연구진단기준 (RDC/TMD) 설문지의 신뢰도를 분석하기 위하여 서울대학교 치과병원 구강내과에 내원한 154명의 턱관절장애 환자들(남자 31명, 여자 123명)에게 한국어판 RDC/TMD 설문지를 작성하게 하였다. 검사-재검사 신뢰도는 동일한 피검자에게 1주 내지 2주 간격으로 같은 설문지를 작성토록 하였다. 설문지의 검사-재검사가 완료되기 전까지는 환자에게 어떠한 치료도 제공되지 않았다.

첫번째 검사로 본 통증강도(pain intensity), 장애점수(disability score), 악기능장애(jaw disability) 및 심리사회적 상태(psychosocial status)의 내적 일관성(internal consistency)의 신뢰도는 크론바흐-알파(Cronbach's alpha) 계수로 각각 0.92, 0.94, 0.68, 0.94 였다. 검사-재검사 신뢰도의 각 설문항목별 상관계수는 0.40에서 0.94까지의 범위로 나타났으며, 각각의 세부 항목별 등급내 상관계수(intra-class correlation coefficient; ICC)는 0.81에서 0.93의 범위로 나타났다. 만성통증척도(Graded Chronic Pain)의 검사-재검사 신뢰도계수는 0.63이었다. 한국어판 RDC/TMD 설문지는 좋은 신뢰도를 보였으며, 한국인의 측두하악장애 환자들에서 심리사회적측면을 분석하는데 유용하게 사용될 수 있다.

주제어: 측두하악장애 연구진단기준, 설문지, 내적 일관성, 검사-재검사, 신뢰도

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## 환자병력 설문지

각 질문의 내용을 잘 읽으시고, 지시에 따라 대답하여 주시기 바랍니다. 각 질문 밑에는 한가지 대답만 동그라미 표시하여 주시기 바랍니다.

1. 당신의 건강은 대체적으로 어떠하다고 (대단히 좋다, 매우 좋다, 좋다, 보통이다, 나쁘다) 말할 수 있습니까?

- 대단히 좋다 ..... 1
- 매우 좋다 ..... 2
- 좋다 ..... 3
- 보통이다 ..... 4
- 나쁘다 ..... 5

2. 당신의 구강 건강은 대체적으로 어떠하다고 (대단히 좋다, 매우 좋다, 좋다, 보통이다, 나쁘다) 말할 수 있습니까?

- 대단히 좋다 ..... 1
- 매우 좋다 ..... 2
- 좋다 ..... 3
- 보통이다 ..... 4
- 나쁘다 ..... 5

3. 지난 한달 동안에 안면부, 턱, 관자놀이, 귀 앞 부위, 귀 안쪽부위 등에 통증을 느끼신 적이 있습니까?

- 아니오..... 0
- 예 ..... 1

[만약, 지난 한달 동안에 통증이 전혀 없으셨다면 14번 질문으로 가세요.]

만약 통증이 있으셨다면,

4a. 안면 통증이 제일 처음 시작된 적은 몇 년 전부터입니까? \_\_\_\_\_년 전부터

[만약 1년 이상 되셨으면, 5번 질문으로 가세요.] [만약 1년 미만이면, 코드 00]

b. 안면 통증이 제일 처음 시작된 적은 몇 개월 전부터입니까? \_\_\_\_\_개월 전부터

5. 당신의 안면 통증은 지속적입니까, 재발성입니까, 아니면 지금까지 단 한번만 나타났었습니까?

- 지속적..... 1
- 재발성..... 2
- 한번만 있었음 ..... 3

6. 당신은 안면부 찌심이나 통증으로 내과 의사, 치과 의사, 지압사 혹은 기타 다른 의료인을 찾아가신 적이 있으십니까?

- 아니오 ..... 1
- 예, 지난 6개월 안에 ..... 2
- 예, 지난 6개월 이전에 ..... 3

7. 당신의 지금 느끼시는 안면통증을 0 에서부터 10까지의 숫자, 즉 0은 통증이 없다, 10은 상상할 수 있는 최대의 통증으로 표현하신다면, 어느 정도라고 할 수 있습니까?

통증이 없다.												상상할 수 있는 최대 통증
0	1	2	3	4	5	6	7	8	9	10		

8. 지난 6개월 동안, 당신이 경험하셨던 가장 심한 통증을 0 에서부터 10까지의 숫자, 즉 0은 통증이 없다, 10은 상상할 수 있는 최대의 통증으로 표현하신다면, 어느 정도였다고 할 수 있습니까?

통증이 없다.												상상할 수 있는 최대 통증
0	1	2	3	4	5	6	7	8	9	10		

9. 지난 6개월 동안의 통증을 평균으로 표현하신다면, 0 에서 부터 10까지의 숫자, 즉 0은 통증이 없다, 10은 상상할 수 있는 최대의 통증에서 어느 정도 심했습니까?(즉, 당신이 일상 생활 중에 느끼셨던 통증의 정도입니다.)

통증이 없다.												상상할 수 있는 최대 통증
0	1	2	3	4	5	6	7	8	9	10		

10. 지난 6개월 동안 대략 며칠간을 안면 통증 때문에 일상 생활(일, 학교 나 집안일)에 지장을 받으셨습니까?  
\_\_\_\_\_ 일

11. 지난 6개월 동안 안면 통증이 당신의 일상 생활에 지장을 준 정도를 0 에서부터 10까지의 숫자, 즉 0은 지장을 주지 않았다, 10은 어떤 일도 할 수 없었다로 표현하신다면, 어느 정도 입니까?

지장을 주지 않았다.												상상할 수 있는 최대 통증
0	1	2	3	4	5	6	7	8	9	10		

12. 지난 6개월 동안 안면 통증이 당신의 여가생활, 사회생활, 가정생활에 지장을 준 정도를 0 에서부터 10까지의 숫자, 즉 0은 지장을 주지 않았다, 10은 어떤 일도 할 수 없었다로 표현하신다면, 어느 정도 입니까?

지장을 주지 않았다.												상상할 수 있는 최대 통증
0	1	2	3	4	5	6	7	8	9	10		

13. 지난 6개월간 안면 통증이 당신의 업무능력(집안일 포함)에 지장을 준 정도를 0 에서부터 10까지의 숫자, 즉 0은 지장을 주지 않았다, 10은 어떤 일도 할 수 없었다로 표현하신다면, 어느 정도 입니까?

지장을 주지 않았다.												상상할 수 있는 최대 통증
0	1	2	3	4	5	6	7	8	9	10		

14.a. 턱이 걸려 입이 잘 안 벌어진 경험이 있으십니까?  
 아니오.....0  
 예.....1

[만약 입이 잘 안벌어지신 적이 없으셨다면 15번 질문으로 가세요.]

그러한 경험이 있으셨다면,  
 14.b. 입이 잘 안 벌어져서 식사에 지장이 있으실 정도이셨습니까?  
 아니오.....0  
 예.....1

15.a. 입을 벌리거나 다물 때 혹은 씹을 때, 턱에서 ‘딸깍’하는 소리나 딱 소리가 작게 또는 크게 나십니까?  
 아니오.....0  
 예.....1

b. 입을 벌리거나 다물 때 혹은 씹을 때, 턱에서 무엇을 가는 듯한 소리나 문지르는 듯한 소리가 나십니까?  
 아니오.....0  
 예.....1

c. 저녁에 잘 때 이를 갈거나 물고 있다고 주의를 듣거나 이야기를 들은 적이 있으십니까?  
 아니오.....0  
 예.....1

d. 낮에 이를 갈거나 물고 계십니까?  
 아니오.....0  
 예.....1

e. 아침에 일어 날 때 턱에서 통증이 있거나 빠근한 느낌이 있으십니까?  
 아니오.....0  
 예.....1

f. 귀에서 잡음이나 ‘윙’하는 소리가 나십니까?  
 아니오.....0  
 예.....1

g. 이를 무실 때 불편감이나 평상시와 다른 느낌이 드십니까?  
 아니오.....0  
 예.....1

16.a. 류마티스성 관절염이나 낭창, 혹은 기타 다른 전신적 관절 질환이 있으십니까?  
 아니오.....0  
 예.....1

b. 가족 중에 위의 질환을 이전부터 가지고 있으신 분이 있으십니까?  
 아니오.....0  
 예.....1

c. 귀 앞 관절 (턱관절) 이외에 부어오르거나 아프신 다른 관절이 있으십니까?  
 아니오.....0  
 예.....1

[만약 붓거나 아픈 다른 관절이 없으시다면, 17.a.번 질문으로 바로 가세요.]

만약 있으시다면,

d. 적어도 1년 이상 지속되는 통증입니까?

아니오.....0  
예.....1

17.a. 최근 안면부나 턱 부위에 상해를 입으신 적이 있으십니까?

아니오.....0  
예.....1

[만약 최근에 상해를 입으신 적이 없으시다면, 18번 질문으로 가세요.]

만약 있으시다면,

17.b. 상해를 입기 전에도 턱이 아프셨습니까?

아니오.....0  
예.....1

18. 지난 6개월 동안 두통이나 편두통으로 고생하신 적이 있으십니까?

아니오.....0  
예.....1

19. 다음 중 어떤 행위들이 턱 문제로 인하여 지장이 있으시거나 제한 받으십니까?

- |               |           |                |           |
|---------------|-----------|----------------|-----------|
| a. 씹기         | 아니오.....0 | b. 마시기         | 아니오.....0 |
|               | 예.....1   |                | 예.....1   |
| c. 운동하기       | 아니오.....0 | d. 딱딱한 음식 먹기   | 아니오.....0 |
|               | 예.....1   |                | 예.....1   |
| e. 부드러운 음식 먹기 | 아니오.....0 | f. 미소짓기/웃기     | 아니오.....0 |
|               | 예.....1   |                | 예.....1   |
| g. 성행위        | 아니오.....0 | h. 이닦기 나 세수하기  | 아니오.....0 |
|               | 예.....1   |                | 예.....1   |
| i. 하품하기       | 아니오.....0 | j. 음식물 삼키기     | 아니오.....0 |
|               | 예.....1   |                | 예.....1   |
| k. 말하기        | 아니오.....0 | l. 평상시 얼굴표정 짓기 | 아니오.....0 |
|               | 예.....1   |                | 예.....1   |

20. 지난달에 다음 열거한 항목들로 인하여 얼마만큼 고통 받으셨습니까?

	전혀	약간	중간정도	약간많이	매우
a. 두통	0	1	2	3	4
b. 성욕 상실	0	1	2	3	4
c. 현기증이나 어지러움	0	1	2	3	4
d. 심장부위나 가슴의 통증	0	1	2	3	4
e. 기력이 감소하거나 처진 느낌	0	1	2	3	4

f. 죽음에 대한 생각이나 죽어간다는 생각	0	1	2	3	4
g. 식욕감소	0	1	2	3	4
h. 쉽게 울음이 터짐	0	1	2	3	4
i. 자책감(자기비난)	0	1	2	3	4
j. 허리뒤의 통증	0	1	2	3	4
k. 외로움	0	1	2	3	4
l. 우울감	0	1	2	3	4
m. 지나친 걱정	0	1	2	3	4
n. 모든 것에 흥미가 없음	0	1	2	3	4
o. 매스꺼움이나 위경련	0	1	2	3	4
p. 근육의 통증	0	1	2	3	4
q. 잠들기 어려움	0	1	2	3	4
r. 숨쉬기 어려움	0	1	2	3	4
s. 몸이 차거나 뜨거운 느낌이 반복	0	1	2	3	4
t. 몸이 일부가 감각이 없거나 따끔거리는 느낌	0	1	2	3	4
u. 목안이 부어오름	0	1	2	3	4
v. 미래에 대한 절망감	0	1	2	3	4
w. 몸 일부분의 허약감	0	1	2	3	4
x. 팔이나 다리가 무거운 느낌	0	1	2	3	4
y. 죽고 싶다는 느낌	0	1	2	3	4
z. 과식	0	1	2	3	4
aa. 아침 일찍 잠이 깬	0	1	2	3	4
bb. 잠자리가 불편하거나 방해받음	0	1	2	3	4
cc. 모든 것이 힘들다는 느낌	0	1	2	3	4
dd. 무의미하다는 느낌	0	1	2	3	4
ee. 갇혀 있거나 잡혀있다는 느낌	0	1	2	3	4
ff. 죄의식	0	1	2	3	4

21. 당신은 전반적으로 얼마나 잘 건강관리를 하고 계신다고 생각하십니까?

- 대단히 잘 관리하고 있다.....1
- 매우 잘 관리하고 있다..... 2
- 잘 관리하고 있다..... 3
- 그런 데로 관리하고 있는 편이다... 4
- 관리하고 있지 못하다..... 5

22. 당신은 얼마나 잘 구강 건강관리를 하고 계신다고 생각하십니까?

- 대단히 잘 관리하고 있다.....1
- 매우 잘 관리하고 있다..... 2
- 잘 관리하고 있다..... 3
- 그런 데로 관리하고 있는 편이다... 4
- 관리하고 있지 못하다..... 5

23. 언제 태어나셨습니까?

월\_\_\_일\_\_\_연도\_\_\_

24. 성별은?

- 남.....1
- 여.....2

25. 다음 중 어느 인종에 속하십니까?

- 동양인 ..... 1                      흑인 ..... 3
- 백인 ..... 2                        기타 ..... 4

\_\_\_\_\_ (자세히 쓰세요.)

26. 다음 중 당신의 선조는 어느 집단에 속하십니까?

- 한국인 ..... 1
- 외국인 ..... 2

27. 당신이 마치신 최종 학년은?

- |                  |    |    |    |    |    |     |
|------------------|----|----|----|----|----|-----|
| 학교를 다니지 않았거나 유치원 | 00 |    |    |    |    |     |
| 초등학교             | 1  | 2  | 3  | 4  | 5  | 6   |
| 중학교              | 7  | 8  | 9  |    |    |     |
| 고등학교             | 10 | 11 | 12 |    |    |     |
| 대학교              | 13 | 14 | 15 | 16 | 17 | 18+ |

28.a. 지난 2주간 집안일(또는 보수가 없는 가족일) 이외에 직장이나 사업에 종사하신 적이 있으십니까?

- 아니오.....0
- 예.....1

[만약 있으시다면 29번 질문으로 바로 가세요.]

만약 없으시다면,

28 b. 비록 지난 2주간 일을 하지 않으셨지만, 직장이나 사업을 가지고 있으셨습니까?

- 아니오.....0
- 예.....1

[만약 있으셨다면 질문 29번으로 바로 가세요.]

만약 없으셨다면,

28.c. 지난 2주 동안 직장을 찾고 계셨다거나 혹은 휴직상태 이셨습니까?

- 예, 직장을 찾고 있었습니다..... 1
- 예, 휴직상태였습니다..... 2
- 예, 휴직상태였고 직장을 찾고 있었습니다... 3
- 아니오.....4

29. 당신은 결혼하셨습니까, 배우자가 사망하셨습니까, 이혼하셨습니까, 별거 중입니까, 아니면 결혼한 적이 없으십니까?

- 결혼하였음 - 배우자 이외에 다른 가족 구성원 있음.....1
- 결혼하였음 - 배우자 이외에 다른 가족 구성원 없음.....2
- 배우자가 사망.....3
- 이혼 ..... 4
- 별거 ..... 5
- 결혼한 적 없음..... 6

30. 지난 12개월 동안의 가계 총 수입은 다음 중 어디에 해당되십니까?

- |                                 |                                |                      |
|---------------------------------|--------------------------------|----------------------|
| _____ 0 - 14,999,999원           | _____ 25,000,000 - 34,999,999원 | _____ 50,000,000원 이상 |
| _____ 15,000,000원 - 24,999,999원 | _____ 35,000,000 - 49,999,999원 |                      |

31. 지금 살고 계시는 지역은 어디입니까?

- |            |            |            |            |            |
|------------|------------|------------|------------|------------|
| _____ 서울   | _____ 부산   | _____ 인천   | _____ 대전   | _____ 대구   |
| _____ 울산   | _____ 광주   |            |            |            |
| _____ 경기도  | _____ 강원도  | _____ 충청북도 | _____ 충청남도 | _____ 경상북도 |
| _____ 경상남도 | _____ 전라북도 | _____ 전라남도 | _____ 제주도  |            |