

Cross-cultural adaptation, validity, and reliability of the Turkish version of the Oral Behaviours Checklist

Besime Ahu Kaynak¹  | Arda Aktaş²  | Muhammed Taha Tüfek³  | Serkan Taş⁴ 

¹School of Health Science, Department of Health Management, Toros University, Mersin, Turkey

²School of Health Science, Department of Physical Therapy and Rehabilitation, Balıkesir University, Balıkesir, Turkey

³Vocational School of Health Services, Department of Physiotherapy, Toros University, Mersin, Turkey

⁴School of Health Science, Department of Physical Therapy and Rehabilitation, Toros University, Mersin, Turkey

Correspondence

Serkan Taş, PT, PhD, School of Health Science, Department of Physical Therapy and Rehabilitation, Toros University, Bahçelievler Mahallesi, 16. Cadde, No:77, 33140 Mersin, Turkey.

Email: serkntas@gmail.com

Funding information

This research was carried out without funding.

Abstract

Aim: Determining the occurrence of oral parafunctional behaviors is essential for the clinical management of temporomandibular disorders (TMDs). For this reason, the evaluation of parafunctional behaviors in patients with TMDs is highly important.

Methods: The purpose of the present study was to investigate the validity and reliability of the Turkish version of the Oral Behaviours Checklist (OBC-T) in patients with TMDs. To determine the reliability of the questionnaire, it was applied in 142 patients with TMDs twice at a 2-week interval. For concurrent validity of the OBC, Spearman correlation analysis was performed with Fonseca Anamnestic Index (FAI), Patient Health Questionnaire-9 (PHQ-9), Jaw Function Limitation Scale-20 (JFLS-20), and Tampa Scale for Kinesiophobia for TMDs (TSK-TMDs).

Results: Items had good to excellent test–retest reliability. The OBC-T score was correlated with FAI, JFLS-20, PHQ-9, and TSK-TMDs scores.

Conclusion: These results provided important evidence that the OBC-T can be used to evaluate parafunctional behaviors in individuals with TMDs in Turkish-speaking populations.

KEYWORDS

oral parafunctional behaviors, reliability, temporomandibular disorders, Turkish version, validity

1 | INTRODUCTION

Oral parafunctional behaviors are oral activities other than the basic functions of the oral region such as chewing, swallowing, and communication.¹ Grinding, clenching, nail/cheek/lip/object biting, and other tongue and jaw movements are the most often cited oral parafunction behaviors.^{2,3} The association between the presence of oral parafunctional behavior and temporomandibular disorders (TMDs) has been shown in many previous studies. It was reported that oral parafunctional behaviors may overburden the dental and masticatory system, and it may lead to the development of TMDs.⁴ Moreover, oral parafunctional behaviors are thought to be one of the first signs of TMDs.⁵ Furthermore, some research claim that the amount, frequency, intensity, and duration of parafunctional behaviors can indicate the severity of TMD signs and

symptoms.⁶ Because of these reasons, determining the occurrence of oral parafunctional behaviors is essential for clinical management of TMDs.

There are several tools such as self-reports, questionnaires, and interviews used to evaluate the parafunctional behaviors.⁷ One of the assessment methods for oral parafunctional behaviors is the Oral Behaviours Checklist (OBC). This checklist was created by Ohrbach et al.,⁸ supported by expert opinions and patient comments. It is a self-report questionnaire with 21 items that assesses the frequency of observable and unobservable oral parafunctional behaviors. Each question is answered in a 5-point Likert type (0–4). The total score that can be obtained from the OBC ranges from 0 to 84.⁹ Due to the general known impact of oral parafunctional behaviors to TMDs, the OBC has been included as a screening method in the newly proposed Diagnostic Criteria for TMD (DC/TMD).¹⁰

The OBC was created in English,⁸ and it was translated into several languages. Furthermore, the reliability and validity of the OBC was investigated for various populations such as Dutch, Italian, Chinese, and Portuguese. These studies have shown that the OBC is a reliable and valid tool for the presence and/or severity of the oral parafunctional behaviors in patients with TMDs.¹¹⁻¹⁴ To our knowledge, there was no study in the literature investigating the reliability and validity of the OBC in the Turkish population. The validity and/or reliability of the OBC may differ in Turkish population because of cultural differences. Furthermore, the use of cross-culturally adapted self-report questionnaires in studies conducted in countries with different language and cultural backgrounds may allow more reliable results to be obtained during the data collection process, and it allows these results to be compared with data from other countries. As a result, the current study aimed to translate and cross-culturally adapt the OBC from English to Turkish, as well as to examine the validity and reliability of the Turkish version of the OBC (OBC-T) in Turkish patients with TMDs. We hypothesized that the OBC-T has adequate reliability and validity to examine the oral parafunctional behaviors in patients with TMDs in Turkish population.

2 | MATERIALS AND METHODS

2.1 | Sample size calculation

A statistical analysis program was used to determine the minimum sample size (SPSS Sample Power 3.0 Software, IBM Corporation, Armonk, NY, USA). The minimum acceptable confidence value (class correlation coefficient) was 0.70, the expected value of reliability (class correlation coefficient) was 0.85, and with 90% power ($1 - \beta$) and a 1% level of significance (α), it was established that this study should comprise at least 119 people.¹⁵ Considering the 15% dropout probability, the number of patients to be included in the study was determined as 137.

2.2 | Study design

This study aimed to determine the validity and reliability of the OBC-T in a cross-sectional observational study. The present study was carried out in three phases. In the first phase, the OBC was translated into Turkish and culturally adapted to Turkish population. In the second phase, participants were selected for the study by an oral surgeon according to the DC/TMD. In the third phase, the validity and reliability of the OBC were examined. To evaluate the reliability of the OBC-T, it was administered to the same individuals at a 2-week interval. To evaluate the validity of the checklist, the Fonseca Anamnestic Index (FAI), the Jaw Function Limitation Scale-20 (JFLS-20), the Patient Health Questionnaire-9 (PHQ-9), and the Tampa Kinesiophobia Scale were applied to the same individuals. Before the study, permission and approval were obtained from ethics committee of the Toros University in order to conduct the study (Protocol Number:

2022-06-24). Oral and written informed consent was obtained from all participants. This study was conducted in accordance with the Declaration of Helsinki.

2.3 | First phase translation and cultural adaptation of the OBC

The cultural equivalence of the OBC was carried out based on the International Network for Orofacial Pain and Related Disorders Methodology (INFORM) guidelines.¹⁶ First, two independent multilingual translators completed the Turkish translation of the English version of the OBC (a healthcare expert and a nonmedical translator). After the translation of the OBC into Turkish was completed by the translators, a draft of the Turkish version was prepared by integrating the translated versions with a decision meeting held by an oral surgeon and three physical therapists. After that, the draft of the Turkish version of the OBC was translated back to English by two native English translators with a good command of Turkish. An oral surgeon and three physical therapists, who are familiar with patients with TMDs, coordinated and reviewed all versions of the checklist. The final version of the OBC-T was applied to a pilot group (15 patients with TMDs). These patients were asked to assess the comprehensibility of each OBC-T items. The final form of the OBC-T was approved because all the patients with TMDs found the items of the OBC-T understandable.

2.4 | Second phase identifying participants

Five hundred and sixty four university students and staff were screened using the FAI, which was defined as a valid and reliable tool to identify the presence of TMD.¹⁷ One hundred and sixty-seven individuals with an FAI score of 20 or above were invited to participate in the present study. To confirm the presence of TMD, clinical evaluation of individuals was conducted by an oral surgeon with 25 years of clinical experience based on the DC/TMD. Participants were excluded from the present study due to¹ having symptoms related to the temporomandibular region for less than 6 months,² receiving any treatments for TMDs in the previous 1 year,³ having any endocrine, rheumatic, or systematic diseases, or⁴ having a history of head, neck, or upper extremity trauma or surgical intervention. As a result of clinical evaluations, 142 participants with TMDs (34 males, 108 females) with ages varying from 18 to 67 (28.8 ± 11.7 years) were included in the study.

2.5 | Third phase evaluation of the validity and reliability of the OBC

The data were obtained between May 2022 and August 2022. All questionnaires used for validity and reliability were administered by the same researcher face-to-face.

2.6 | Reliability

One hundred and forty-two patients were requested to complete the questionnaire. To evaluate test–retest reliability, they were invited to complete the questionnaire again after 2 weeks. It was approved that the patients did not receive any TMD treatments during this period.

2.7 | Validity

The FAI, the PHQ-9, the JFLS-20, and the Tampa Scale for Kinesiophobia for TMDs (TSK-TMDs) were used to determine the validity of the OBC-T.

2.7.1 | FAI

The FAI is used to determine the presence and severity of TMDs and was reported to be valid and reliable in Turkish population.¹⁷ The FAI consists of 10 questions. Each question is answered as *yes*, *no*, or *sometimes*. Patients are asked to select just one choice, 10 points for each *yes* response, 5 points for each *sometimes* response, and 0 points for each *no* response. The overall score varying from 0 to 100, and the total score is classified as no TMD (0–15), mild TMD (20–40), moderate TMD (45–65), and severe TMD (70–100).

2.7.2 | PHQ-9

The PHQ-9 was used to evaluate the symptoms of depression related to TMDs in the present study.¹⁸ The PHQ-9 consists of nine questions to determine the quality of life and patient health level. Each question is a Likert-type scale scored between 0 and 3. The total score varies from 0 to 27. A high score indicates a decrease in quality of life.¹⁹

2.7.3 | The JFLS-20

The JFLS-20 was used to evaluate the jaw joint function limitation and disability level in individuals with TMDs.²⁰ The scale consists of 20 questions, and each item is scored between 0 and 10. The overall score is between 0 and 200, and a high score implies more severe disability.²¹

2.7.4 | The TSK-TMDs

TSK-TMD was used to evaluate the fear of movement in individuals with TMDs. The version of the scale adapted to patients with TMDs was developed by Visscher et al. in 2010.²² It consists of 12 questions. There are four alternative answers to each question: *Strongly disagree*, *Partly disagree*, *Partly agree*, and *Strongly agree*. The overall score is between 12 and 48, and a high score indicates a high level of fear.

2.8 | Statistical Analysis

The statistical analysis was conducted using a statistical analysis program (SPSS version 22 software, IBM Corporation, Armonk, NY, USA). The intraclass correlation coefficient was used to evaluate the reliability and internal consistency (ICC3,1, model; two-way mixed model, consistency) of the OBC. Cronbach's alpha coefficient was used to evaluate internal consistency. The internal consistency of the evaluated parameters was considered excellent when the Cronbach's alpha value of the parameters was greater than 0.70.²³ Conduct validity of the OBS-T was evaluated by convergent validity and factor analysis. Bartlett's test was used to determine the suitability of the sample size, and the Kaiser–Meyer–Olkin measure was used to assess the adequacy of the sample before factor analyses. The Pearson correlation coefficient was calculated between the OBC and the FAI, the JFLS-20, the PHQ-9, and the TSK-TMD to assess the convergent validity of the OBC. The degrees of reliability correlation were taken as 1.00–0.81 (excellent), 0.80–0.61 (good), 0.60–0.41 (moderate), 0.40–0.21 (fair), and 0.20–0.00 (poor).²² Any *p* value below 0.05 was interpreted as the presence of a significant relationship.

3 | RESULTS

The detailed descriptive information of the participants and the results of the questionnaires are given in Table 1.

3.1 | Reliability

The test–retest reliability scores for all items of the OBC are shown in Table 2. The ICC scores of the items vary from 0.717 to 0.904. All items had excellent test–retest reliability (ICC = 0.812–0.904), with the exception of item 17 (ICC = 0.717), item 11 (ICC = 0.734), item

TABLE 1 Descriptive data of participants.

Parameters	Mean (SD)	Minimum–maximum
Age (year)	28.8 ± 11.7	18–67
Height (m)	1.68 (0.08)	1.50–1.90
Mass (kg)	64.6 (13.3)	43–105
Body mass index (kg/m ²)	22.8 (3.8)	15.1–38.1
Gender (female/male) (%)	108 (76%) /34 (24%)	
Oral Behaviours Checklist; (score)	27.4 (10.9)	3–57
Fonseca Anamnestic Index (score)	45.6 (19.9)	20–100
Jaw Function Limitation Scale-20 (score)	27.6 (24.0)	0–124
Patient Health Questionnaire-9 (score)	10.6 (5.9)	0–26
Tampa Scale for Kinesiophobia for TMDs (score)	20.3 (6.4)	12–38

20 (ICC = 0.762), and item 7 (ICC = 0.795), which had good correlation (Table 2).

3.2 | Internal consistency

Internal consistency analysis of the OBC resulted in a Cronbach's alpha coefficient of 0.819. The Cronbach's alpha value coefficient indicates that the OBC has a high level of internal consistency (Table 3).

3.3 | Convergent validity

The correlation analysis results between the OBC and selected indexes are given in Table 4. There was a significant correlation between the OBC-T and the FAI ($r = 0.711$, $p = 0 < 0.001$), the JFLS-20 ($r = 0.525$, $p = 0 < 0.001$), the PHQ-9 ($r = 0.613$, $p = 0 < 0.001$), and the TSK-TMD ($r = 0.537$, $p = 0 < 0.001$) (Table 4).

3.4 | Factor analysis

The Keiser–Meyer–Olkin test value was found as 0.807, suggesting that the sample used in the study was appropriate. The Battlett test

value was calculated as 963.686, indicating that the sample data were sufficient and homogeneous. These findings indicate that the OBC-T was both adequate and appropriate. The OBC-T had 20 factorial structures by scree plot graph on factor analysis (Figure 1). The seven factors of the OBC-T constitute 65.9% of the total variance according to the total variance analysis (Table 5).

4 | DISCUSSION

The aim of this study was to translate and cross-culturally adapt the OBC from English to Turkish and to evaluate the validity and reliability

TABLE 3 Internal consistency of the Turkish versions of Oral Behaviours Checklist.

Scale item no.	Internal consistency (Cronbach's alpha) if item deleted	Corrected item-total correlation
1	0.807	0.452
2	0.814	0.360
3	0.804	0.546
4	0.796	0.665
5	0.798	0.643
6	0.802	0.583
7	0.801	0.596
8	0.807	0.811
9	0.811	0.383
10	0.809	0.415
11	0.814	0.327
12	0.812	0.365
13	0.823	0.121
14	0.821	0.136
15	0.808	0.443
16	0.811	0.390
17	0.815	0.300
18	0.826	0.162
19	0.817	0.270
20	0.813	0.350
21	0.820	0.182

TABLE 2 Test-retest analysis of the Turkish versions of Oral Behaviours Checklist.

Scale item no.	ICC	ICC (95% CI)
1	0.902	0.863–0.929
2	0.831	0.765–0.879
3	0.841	0.779–0.886
4	0.894	0.853–0.924
5	0.845	0.784–0.889
6	0.848	0.788–0.891
7	0.795	0.714–0.853
8	0.883	0.837–0.916
9	0.853	0.795–0.895
10	0.865	0.812–0.903
11	0.734	0.625–0.811
12	0.812	0.738–0.865
13	0.871	0.821–0.908
14	0.904	0.866–0.931
15	0.815	0.742–0.867
16	0.821	0.751–0.872
17	0.717	0.606–0.796
18	0.887	0.843–0.919
19	0.872	0.822–0.908
20	0.762	0.669–0.829
21	0.833	0.768–0.880

TABLE 4 Correlation values of OBC-T with other questionnaires.

	Pearson's correlation of the OBC-T	
	<i>r</i>	<i>p</i>
Fonseca Anamnestic Index	0.711	<0.001
Jaw Function Limitation Scale-20	0.525	<0.001
Patient Health Questionnaire-9	0.613	<0.001
Tampa Scale for Kinesiophobia for TMD	0.537	<0.001

of the Turkish version of the OBC (OBC-T) in the Turkish population. According to the results, the OBC-T has moderate to excellent reliability with a high level of internal consistency. Furthermore, it was found that the OBC-T is valid in patients with TMDs in the Turkish population.

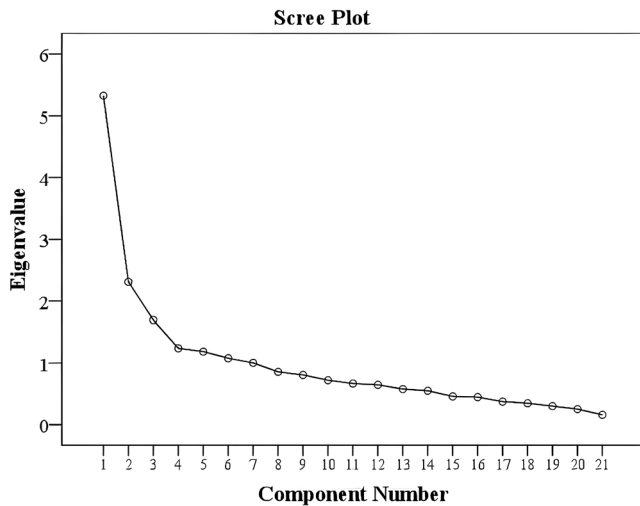


FIGURE 1 Scree plot graph of the Turkish version of the Oral Behaviours Checklist (OBC).

According to the findings, the OBC-T demonstrated good reliability in the Turkish population. All items have good to excellent test-retest reliability ($ICC = 0.72-0.90$). Based on these results, the Turkish version of the OBC has good reliability to determine the parafunctional behaviors in individuals with TMDs in Turkish populations. There are a few studies investigating the reliability of the OBC in different populations. Barbosa et al.¹¹ reported that the reliability of the Portuguese version of the OBC had excellent correlation in patients with TMDs ($ICC = 0.93-1.00$). Donnarumma et al.¹³ reported that the reliability of the Italian version of the OBC ranged from good to excellent in patients with TMDs ($ICC = 0.66-0.90$).

As a result of the internal consistency analysis of the OBC-T, the Cronbach's alpha value is 0.819. The obtained Cronbach's alpha value demonstrates that the OBC-T is highly reliable. In the Chinese version of the OBC, Cronbach's alpha value was 0.771. The reliability of the Chinese version of the OBC was good.¹⁴ In the Italian version of the OBC, Cronbach's alpha value was 0.87. The reliability of the Italian version of the OBC was excellent.¹³ In the Portuguese version of the OBC, Cronbach's alpha value was 0.998. The reliability of the Portuguese version of the OBC was excellent.¹¹

The factor analysis was performed using the Keiser-Meyer-Olkin and Barlett's tests to evaluate the validity of the OBS-T. The Keiser-Meyer-Olkin value was determined to be 0.928, and the Barlett's value was 868.629. These results suggest that the OBS-T is

TABLE 5 Total variance analysis of OBC-T.

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	5.329	25.374	25.374	5.329	25.374	25.374
2	2.313	11.014	36.388	2.313	11.014	36.388
3	1.695	8.071	44.459	1.695	8.071	44.459
4	1.238	5.896	50.355	1.238	5.896	50.355
5	1.185	5.642	55.997	1.185	5.642	55.997
6	1.077	5.127	61.125	1.077	5.127	61.125
7	1.003	4.775	65.900	1.003	4.775	65.900
8	0.857	4.080	69.979			
9	0.806	3.839	73.818			
10	0.720	3.430	77.248			
11	0.668	3.179	80.427			
12	0.647	3.079	83.506			
13	0.578	2.750	86.256			
14	0.550	2.617	88.873			
15	0.459	2.186	91.059			
16	0.446	2.123	93.181			
17	0.374	1.779	94.961			
18	0.346	1.650	96.610			
19	0.300	1.430	98.041			
20	0.253	1.203	99.244			
21	0.159	0.756	100.000			

appropriate for factor analysis. The validity of the OBC-T was evaluated by comparing the results of the OBC with the results of the FAI, the JFLS-20, the TSK-TMD, and the PHQ-9. The results of the OBC-T had a moderate to good correlations with the results of the FAI, the JFLS-20, the TSK-TMD, and the PHQ-9. The results obtained suggest that the OBC-T is a valid tool to evaluate the parafunctional behaviors in individuals with TMDs in Turkish-speaking populations. There are a few studies investigating the validity of the OBC. Similar to our results, Meulen et al.¹² found that the Dutch version of the OBC had a high degree of correlation with the Oral Parafunctions Questionnaire ($r = 0.757$; $p < 0 < 001$). Moreover, Ohrbach et al.³ investigated the validity of 10 oral parafunctions using an EMG device, and they reported that the OBC-T seems to be a valid tool that can be used more frequently in clinical practice and research.

This research has some strong points. First, the larger sample size allows for more precise estimates. Second, the fact that the participants were individuals with TMDs diagnosed by an oral surgeon is important for an accurate assessment of oral parafunctional behaviors in individuals with TMDs. Third, published standard procedures were used during the translation of the OBC into Turkish.¹⁶ Finally, the validity of the OBC measurements was made by comparing them with four different validated questionnaires that are frequently used in the Turkish population.

This research also has some limited points. First, this study was conducted with a group of university students/staff only. Second, the study was not conducted on a specific age group. The validity and reliability of the OBC-T may change depending on the population, such as children, teenagers, or the elderly. Third, potential bias may have been caused by the choice of the self-report method. Finally, in this study, the validity and reliability of OBC-T were studied without considering TMD subtypes such as myogenic, arthrogenic, or mixed TMDs. Further research may be conducted to investigate the validity and reliability of the OBC in TMD subgroups and/or in a more specialized population.

5 | CONCLUSION

Validity and reliability of the English version of the OBC had already been established. The findings showed that the OBC-T had a moderate to excellent test-retest reliability, a high level of internal consistency, and moderate to good correlation with other reliable and valid questionnaires. These results show that there is substantial evidence that the OBC-T can be used as a tool to investigate oral parafunctional behaviors in people with TMDs in Turkey and other Turkish-speaking populations.

AUTHOR CONTRIBUTIONS

Besime Ahu Kaynak, Arda Aktaş, Muhammed Taha Tüfek, and Serkan Taş contributed to study conception and design. Besime Ahu Kaynak, Arda Aktaş, and Muhammed Taha Tüfek performed data acquisition. Arda Aktaş and Serkan Taş performed data analysis. Besime Ahu Kaynak, Arda Aktaş, Muhammed Taha Tüfek, and Serkan Taş wrote and edited

the manuscript. All authors read, subedited, and approved the final version of manuscript.

ACKNOWLEDGMENTS

N/A.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ETHICS STATEMENT

Before the study, permission and approval were obtained from ethics committee of the Toros University in order to conduct the study (Protocol Number: 2022-06-24). This study was conducted in accordance with the Declaration of Helsinki.

PATIENT CONSENT STATEMENT

Oral and written informed consent was obtained from all participants.

CLINICAL TRIAL REGISTRATION

N/A.

ANIMAL STUDIES

N/A.

ORCID

Besime Ahu Kaynak  <https://orcid.org/0000-0001-5874-8802>

Arda Aktaş  <https://orcid.org/0000-0002-2503-8027>

Muhammed Taha Tüfek  <https://orcid.org/0000-0002-9356-4096>

Serkan Taş  <https://orcid.org/0000-0001-8268-5485>

REFERENCES

- Bucci R, Koutris M, Lobbezoo F, Michelotti A. Occlusal sensitivity in individuals with different frequencies of oral parafunction. *J Prosthet Dent.* 2019;122(2):119–22. <https://doi.org/10.1016/j.prosdent.2018.10.006>
- Farsi NM. Symptoms and signs of temporomandibular disorders and oral parafunctions among Saudi children. *J Oral Rehabil.* 2003;30(12):1200–8. <https://doi.org/10.1111/j.1365-2842.2003.01187.x>
- Ohrbach R, Markiewicz MR, McCall WD Jr. Waking-state oral parafunctional behaviors: specificity and validity as assessed by electromyography. *Eur J Oral Sci.* 2008;116(5):438–44. <https://doi.org/10.1111/j.1600-0722.2008.00560.x>
- Miyake R, Ohkubo R, Takehara J, Morita M. Oral parafunctions and association with symptoms of temporomandibular disorders in Japanese university students. *J Oral Rehabil.* 2004;31(6):518–23. <https://doi.org/10.1111/j.1365-2842.2004.01269.x>
- Ohrbach R, Bair E, Fillingim RB, Gonzalez Y, Gordon SM, Lim PF, et al. Clinical orofacial characteristics associated with risk of first-onset TMD: the OPPERA prospective cohort study. *J Pain.* 2013;14(12 Suppl):T33–50. <https://doi.org/10.1016/j.jpain.2013.07.018>

6. Melchior MO, Mazzetto MO, Felício CM. Temporomandibular disorders and parafunctional oral habits: an anamnestic study. *Dental Press J Orthod*. 2012;17(2):83–9. <https://doi.org/10.1590/S2176-94512012000200016>
7. Funato M, Ono Y, Baba K, Kudo Y. Evaluation of the non-functional tooth contact in patients with temporomandibular disorders by using newly developed electronic system. *J Oral Rehabil*. 2014;41(3):170–6. <https://doi.org/10.1111/joor.12129>
8. Ohrbach R, Beneduce C, Markiewicz M, Mccall WD. Psychometric properties of the oral behaviors checklist: preliminary findings. *J Dent Res*. 2004;83(special issue A):1194.
9. Ohrbach R. Assessment and further development of RDC/TMD Axis II biobehavioural instruments: a research programme progress report. *J Oral Rehabil*. 2010;37(10):784–98. <https://doi.org/10.1111/j.1365-2842.2010.02144.x>
10. 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†. *J Oral Facial Pain Headache*. 2014;28(1):6–27. <https://doi.org/10.11607/jop.1151>
11. Barbosa C, Manso MC, Reis T, Soares T, Gavinha S, Ohrbach R. Cultural equivalence, reliability and utility of the Portuguese version of the Oral Behaviours Checklist. *J Oral Rehabil*. 2018;45(12):924–31. <https://doi.org/10.1111/joor.12716>
12. van der Meulen MJ, Lobbezoo F, Aartman IH, Naeije M. Validity of the Oral Behaviours Checklist: correlations between OBC scores and intensity of facial pain. *J Oral Rehabil*. 2014;41(2):115–21. <https://doi.org/10.1111/joor.12114>
13. Donnarumma V, Cioffi I, Michelotti A, Cimino R, Vollaro S, Amato M. Analysis of the reliability of the Italian version of the Oral Behaviours Checklist and the relationship between oral behaviours and trait anxiety in healthy individuals. *J Oral Rehabil*. 2018;45(4):317–22. <https://doi.org/10.1111/joor.12614>
14. Tang Y, Fan S, Yao Y, Xu LL, Cai B. Oral behavior characteristics of 540 patients suffering from temporomandibular disorders. *Shanghai Kou Qiang Yi Xue*. 2021;30(5):531–4. <https://doi.org/10.19439/j.sjos.2021.05.016>
15. Bonett DG. Sample size requirements for estimating intraclass correlations with desired precision. *Stat Med*. 2002;21(9):1331–5. <https://doi.org/10.1002/sim.1108>
16. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine (Phila Pa 1976)*. 2000;25(24):3186–91. <https://doi.org/10.1097/00007632-200012150-00014>
17. Kaynak BA, Taş S, Salkın Y. The accuracy and reliability of the Turkish version of the Fonseca anamnestic index in temporomandibular disorders. *Cranio*. 2020;1-6(1):78–83. <https://doi.org/10.1080/08869634.2020.1812808>
18. Hietaharju M, Kivimäki I, Heikkilä H, Näpänkangas 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. <https://doi.org/10.1111/joor.13260>
19. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med*. 2001;16(9):606–13. <https://doi.org/10.1046/j.1525-1497.2001.016009606.x>
20. Lövgren A, Visscher CM, Häggman-Henrikson B, Lobbezoo F, Marklund S, Wänman A. Validity of three screening questions (3Q/TMD) in relation to the DC/TMD. *J Oral Rehabil*. 2016;43(10):729–36. <https://doi.org/10.1111/joor.12428>
21. Ohrbach R, Larsson P, List T. The jaw functional limitation scale: development, reliability, and validity of 8-item and 20-item versions. *J Orofac Pain*. 2008;22(3):219–30. <https://doi.org/10.1111/joor.12428>
22. Visscher CM, Ohrbach R, van Wijk AJ, Wilkosz M, Naeije M. The Tampa scale for kinesiophobia for temporomandibular disorders (TSK-TMD). *Pain*. 2010;150(3):492–500. <https://doi.org/10.1016/j.pain.2010.06.002>
23. Weir JP. Quantifying test-retest reliability using the intraclass correlation coefficient and the SEM. *J Strength Cond Res*. 2005;19(1):231–40. <https://doi.org/10.1519/15184.1>

How to cite this article: Kaynak BA, Aktaş A, Tüfek MT, Taş S. Cross-cultural adaptation, validity, and reliability of the Turkish version of the Oral Behaviours Checklist. *Oral Sci Int*. 2024; 21(3):373–9. <https://doi.org/10.1002/osi2.1230>