

# Linguistic adaptation and validation of the Turkish version of the OSA-18 questionnaire in children with sleep-disordered breathing

## Uykuda solunum bozukluğu olan çocuklara OSA-18 anketinin Türkçe versiyonunun dilsel adaptasyonu ve geçerlik çalışması

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### ABSTRACT

**Objectives:** This study aimed to adapt the Obstructive Sleep Apnea-18 (OSA-18) questionnaire into Turkish and evaluate its reliability and validity.

**Patients and Methods:** A total of 186 children (103 males, 83 females; mean age: 5±2.1 years; range, 2 to 14 years) with sleep-disordered breathing (SDB) who were treated in the ear, nose, and throat clinic between January 2022 and December 2022 were prospectively studied to validate the OSA-18 questionnaire. Children with SDB who were scheduled for adenotonsillectomy were included in the study.

**Results:** In adapting the Turkish version of the OSA-18 questionnaire, it was determined that the 18 statements were grouped under five subheadings, similar to the original study. Based on the Pediatric Sleep Questionnaire, the OSA-18 was 68.6% sensitive and 76.4% specific for detecting SDB.

**Conclusion:** The study results revealed that the Turkish OSA-18 questionnaire is a valuable tool for assessing children with SDB and satisfactory in terms of responsiveness, reliability, and internal consistency.

**Keywords:** Adenotonsillectomy, linguistic adaptation, sleep-disordered breathing, Turkish OSA-18, validity.

### ÖZ

**Amaç:** Bu çalışmada, Obstrüktif Uyku Apnesi-18 (OSA-18) anketinin Türkçeye uyarlaması ve güvenilirliği ve geçerliği değerlendirildi.

**Hastalar ve Yöntemler:** Ocak 2022-Aralık 2022 tarihleri arasında kulak, burun ve boğaz kliniğinde tedavi gören ve uyku bozukluklarına bağlı solunum (SDB) sorunu olan 186 çocuk (103 erkek, 83 kadın; ort. yaş: 5±2.1 yıl; dağılım, 2-14 yıl) OSA-18 anketini doğrulamak amacıyla prospektif olarak incelendi. Adenotonsillektomi planlanan SDB'li çocuklar çalışmaya dahil edildi.

**Bulgular:** Orijinal çalışmaya benzer şekilde, OSA-18 anketinin Türkçe versiyonunu uyarlarken 18 ifadenin beş alt başlık altında gruplandırıldığı belirlendi. Pediatrik Uyku Anketi'ne dayalı olarak, OSA-18 anketi, SDB'yi tespit etmede %68.6 duyarlılığa ve %76.4 özgüllüğe sahipti.

**Sonuç:** Çalışma sonuçları, Türkçe OSA-18 anketinin, SDB'li çocukları değerlendirmede değerli bir yöntem olduğunu ve duyarlılık, güvenilirlik ve tutarlılık açısından yeterli sonuçlar verdiğini ortaya koydu.

**Anahtar sözcükler:** Adenotonsillektomi, dilsel adaptasyon, uyku bozukluklarına bağlı solunum, Türkçe OSA-18, geçerlik.

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The term sleep-disordered breathing (SDB) refers to various airway dysfunctions that occur in sleep, including significant snoring and obstructive sleep apnea syndrome (OSAS).<sup>[1]</sup> Obstructive sleep apnea syndrome involves recurrent partial or complete obstruction of the upper respiratory tract during sleep, leading to impaired oxygenation of the body.<sup>[2]</sup> Sleep-disordered breathing and OSAS significantly impact pediatric patients' quality of life, with recovery after tonsillectomy and adenoidectomy showing notable improvement.

The prevalence of SDB ranges from 8 to 17%,<sup>[3]</sup> and the prevalence of OSAS ranges between 1 and 6%<sup>[4,5]</sup> in the pediatric population. In children, adenotonsillar hypertrophy is a major risk factor for the development of OSAS. Other potential risk factors include increased body mass index and craniofacial anomalies that cause structural problems in the face and jaw.<sup>[6]</sup> Daytime sleepiness, irritability, poor concentration skills, nocturnal enuresis, awakening headaches, and restless sleep are significant symptoms of pediatric OSAS, which have negative consequences for the health and behavior of the individual.<sup>[7]</sup>

Sleep laboratory-based polysomnography is the most effective way to diagnose OSAS in a pediatric population.<sup>[8]</sup> However, polysomnography is not widely available, often involves long waiting lists, is costly, and requires considerable time. Therefore, there is a need for practical screening for the detection of obstructive sleep apnea in children. Recently, Franco et al.<sup>[9]</sup> developed the Obstructive Sleep Apnea-18 (OSA-18) quality of life questionnaire, which is widely used as a screening tool for pediatric OSAS.

Similar to the OSA-18 questionnaire, the Pediatric Sleep Questionnaire (PSQ) is a practical screening tool for pediatric OSAS and SDB, developed and validated by Chervin et al.<sup>[10]</sup> The PSQ is a 22 item questionnaire and has a validated Turkish version.<sup>[11]</sup> The cutoff value for PSQ scores that indicate SDB was expected as 0.33.<sup>[10]</sup>

The patients in our study were not subjected to polysomnography; instead, the patients were subjected to PSQ for the evaluation of SDB. Since polysomnography was not accessible, PSQ scores were used in our study to assess the validity and reliability of the OSA-18 questionnaire. The objectives of our study were to (i) adapt the OSA-18 questionnaire to Turkish and evaluate its validity and reliability, (ii) analyze the correlation between the PSQ and the OSA-18 score, and (iii) identify whether the OSA-18 is applicable as a screening tool for the detection of pediatric OSAS.

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## PATIENTS AND METHODS

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### Translation

A two-phase validation process was involved in validating the questionnaire for OSA-18 in Turkish. Initially, the original English text was translated into Turkish and then reverse-translated and verified. In the second step, the translation was evaluated for accuracy and reliability. The questionnaire was translated from English to Turkish by three otorhinolaryngology specialists and one bilingual expert whose native language was Turkish. By consensus, the researchers and translators unified the four versions. The final version of this document was back-translated by a bilingual translator who was a native English speaker. To enhance semantic equivalence between the English and Turkish versions, three otolaryngologists and the expert translator (a native Turkish speaker) revised the Turkish questionnaire after back-translation. The Turkish OSA-18 questionnaire was created following these phases. An initial pilot test of this version was conducted on 20 parents who volunteered as a convenience sample with adenotonsillar pathology attending the otolaryngology clinic at a tertiary university hospital to check whether the questions were correctly understood. One investigator carried out pilot testing in a direct interview to assess the likelihood that respondents would have difficulty understanding the questionnaire. A revised translation into Turkish was completed after modifications were made to facilitate understanding some aspects (Appendix).

### Setting and participants

An instrument validation study was performed on 186 children (103 males, 83 females; mean age: 5±2.1 years; range, 2 to 14 years) treated at the ear, nose, and throat (ENT) clinic of three tertiary health care hospitals for sleep-related breathing disorders between January 2022 and December 2022. The study involved children with sleep-related breathing disorders who were scheduled for adenotonsillectomy. The patients included in the study were followed prospectively until the time of the second questionnaire. Several factors were excluded from the study, including refusal to participate, syndromes or congenital disabilities, parents' inability to read or understand Turkish, diseases affecting the development of normal growth patterns, and diseases affecting patients' quality of life. The study protocol was approved by the Marmara University Faculty of Medicine Ethics Committee (date: 03.02.2023, no: 09.2021.1216). The parents of the children included in the study provided written informed consent. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Each of the parents of the children included in the research completed the Turkish version of the OSA-18 questionnaire and the validated Turkish version of the PSQ during the first visit to the ENT clinic. The Turkish version of the PSQ, previously validated by Yüksel et al.,<sup>[11]</sup> was used to evaluate the degree and presence of SDB. A second OSA-18 questionnaire was administered one month after the first visit to evaluate the retest results. Following the test and retest assessments, adenotonsillectomy surgery was performed on all children included in the study. One month after surgery, the parents were asked to complete both the OSA-18 questionnaire and the validated Turkish version of the PSQ to evaluate responsiveness.

### Statistical analysis

Data were analyzed using IBM SPSS version 23.0 software (IBM Corp., Armonk, NY, USA). Principal component analysis was conducted to determine the items of the subscales for the OSA-18 questionnaire. The Kaiser–Meyer–Olkin test was used to evaluate the adequacy of the sample size, and a value  $>0.5$  indicated an adequate sample. A minimum acceptable value of 0.7

was used as an indicator of the internal consistency of the Turkish OSA-18 questionnaire in terms of Cronbach's alpha test.<sup>[12]</sup> The scale's reliability was calculated based on the Cronbach's alpha value. A Cronbach's alpha value  $>0.7$  indicated good correlation. Using Pearson's correlation, the reliability of the OSA-18 was evaluated on a test-retest basis during the first visit (test) and one month later (retest) in the outpatient clinic. A Spearman rank correlation analysis was used to assess the validity of the questionnaire by comparing the OSA-18 and PSQ scores prior to adenotonsillectomy. Using paired t-tests, the responsiveness of the OSA-18 and PSQ was evaluated by comparing their scores before and after surgery. A p-value  $<0.05$  was considered statistically significant.

## RESULTS

The OSA-18 questionnaire and PSQ were completed during the initial clinical visit period. Before adenotonsillectomy, the OSA-18 questionnaire was completed during the second clinical visit, and the OSA-18 questionnaire and PSQ were completed one month after surgery.

**Table 1**  
Principal component analysis for the Turkish version of the OSA-18 questionnaire

	Component 1 Caregiver concern	Component 2 Sleep disturbances	Component 3 Physical symptoms	Component 4 Daytime function	Component 5 Emotional symptoms
q16	0.891				
q15	0.839				
q18	0.583				
q17	0.517				
q3		0.885			
q2		0.867			
q1		0.757			
q4		0.453			
q7			0.841		
q6			0.803		
q8			0.605		
q5			0.601		
q12				-0.828	
q14				-0.755	
q13				-0.674	
q10					-0.923
q11					-0.878
q9					-0.859

OSA-18: Obstructive Sleep Apnea-18.

Table 2 Interitem correlation matrix of all the 18 items																		
Inter-Item Correlation Matrix																		
	q1	q2	q3	q4	q5	q6	q7	q8	q9	q10	q11	q12	q13	q14	q15	q16	q17	q18
q1	1.000																	
q2	0.469	1.000																
q3	0.560	0.768	1.000															
q4	0.343	0.442	0.441	1.000														
q5	0.238	0.266	0.226	0.218	1.000													
q6	0.070	0.082	0.108	0.304	0.319	1.000												
q7	0.067	0.114	0.128	0.347	0.351	0.586	1.000											
q8	0.300	0.254	0.278	0.223	0.374	0.246	0.371	1.000										
q9	0.098	0.128	0.100	0.289	0.147	0.225	0.326	0.156	1.000									
q10	0.047	0.107	0.115	0.226	0.178	0.260	0.242	0.040	0.798	1.000								
q11	0.054	0.018	0.043	0.189	0.121	0.280	0.242	0.078	0.682	0.781	10.000							
q12	0.083	0.312	0.308	0.296	0.158	0.063	0.162	0.158	0.243	0.226	0.174	1.000						
q13	0.097	0.111	0.177	0.267	0.193	0.185	0.180	0.130	0.336	0.374	0.471	0.460	1.000					
q14	0.025	0.021	0.108	0.255	0.159	0.065	0.163	0.018	0.263	0.294	0.265	0.498	0.448	1.000				
q15	0.215	0.239	0.255	0.197	0.223	0.104	0.155	0.131	0.201	0.252	0.249	0.204	0.119	0.219	1.000			
q16	0.248	0.224	0.136	0.158	0.212	0.022	0.112	0.266	0.275	0.269	0.207	0.109	0.044	0.208	0.764	1.000		
q17	0.059	0.180	0.174	0.280	0.176	0.177	0.193	0.241	0.353	0.347	0.345	0.410	0.410	0.302	0.438	0.377	1.000	
q18	0.029	0.022	0.036	0.274	0.124	0.101	0.226	0.177	0.403	0.384	0.445	0.229	0.294	0.331	0.420	0.405	0.712	1.000

The structural factor analysis of the Turkish translation of the OSA-18 questionnaire determined that the 18 statements were grouped under five subheadings, similar to the original study (Table 1).

The Kaiser-Meyer-Olkin value of the Turkish translation of the OSA-18 questionnaire was determined to be 0.74. The Cronbach's alpha value of the test was 0.852. In the factor analysis, following the original OSA-18 questionnaire, the questions were divided into five separate categories, and no questions were found to overlap. The correlations of all items with other items were calculated. The items were well correlated with each other (Table 2).

The mean OSA-18 score was  $70.5 \pm 20.5$  in the initial test and  $71.5 \pm 19.3$  in the retest evaluation. The test and

the retest Cronbach's alpha values were 0.852 and 0.857, respectively, and both values indicated a high degree of internal consistency. A significant correlation was found between test and retest evaluation for the total OSA-18 score and for all subscales and items (Table 3).

Scores on the OSA-18 (total and subscales) exhibited a significant correlation ( $p < 0.01$ ; Table 3). The total OSA-18 Cronbach's alpha value was 0.852. The Cronbach's alpha values of the subscales were 0.8, 0.7, 0.89, 0.71, and 0.81 for daytime function, emotional symptoms, caregiver concern, sleep disturbance, and physical symptoms, respectively. Moreover, children with high PSQ scores had higher total OSA-18 scores. As diagnosed by PSQ, OSA-18 detected SDB with a sensitivity of 68.6% and specificity of 76.4% (Table 4).

	Reliability		Validity	Responsiveness
	Consistency	Test-retest	PSQ	Paired t test
Total OSA-18	0.85	0.98	-0.134	<0.001
Sleep disturbances	0.8	0.98	0.18*	<0.001
1	0.54	0.95	0.27**	<0.001
2	0.7	0.95	0.14*	<0.001
3	0.75	0.96	0.19*	<0.001
4	0.48	0.97	0.06	<0.001
Physical symptoms	0.7	0.98	0.057	<0.001
5	0.45	0.93	0.05	<0.001
6	0.51	0.96	-0.13	<0.001
7	0.59	0.98	-0.06	<0.001
8	0.41	0.97	0.08	<0.001
Emotional symptoms	0.89	0.98	-0.348**	<0.001
9	0.78	0.98	-0.26**	<0.001
10	0.85	0.97	0.32**	<0.001
11	0.75	0.96	0.4**	<0.001
Daytime function	0.71	0.97	-0.248**	<0.001
12	0.55	0.96	0.07	<0.001
13	0.51	0.97	0.29**	<0.001
14	0.52	0.99	0.23*	<0.001
Caregiver concern	0.81	0.99	0.131	<0.001
15	0.64	0.98	0.06	<0.001
16	0.63	0.98	-0.05	<0.001
17	0.64	0.98	-0.15*	<0.001
18	0.61	0.98	-0.19*	<0.001

OSA-18: Obstructive Sleep Apnea-18; Consistency: Cronbach's alpha; Test-retest reliability: Interclass correlation coefficient; Reliability: Pearson correlation and all coefficient were significant \*  $p < 0.05$ ; \*\*  $p < 0.001$ ; Validity: Spearman rank correlation; Responsiveness: Paired t-test.

Total OSA-18 score	PSQ <0.33	PSQ ≥0.33	Total
Negative for OSA (<60)	13	53	57
Positive for OSA (≥60)	4	116	129
Total	17	169	186

OSA-18: Obstructive Sleep Apnea-18; PSQ: Pediatric Sleep Questionnaire.

All patients underwent adenotonsillectomy. The mean OSA-18 total score was  $70.5 \pm 20.5$  preoperatively versus  $26.9 \pm 12.1$  postoperatively, and there was a statistically significant decrease in all OSA-18 subscale scores after adenotonsillectomy, indicating good responsiveness (Figure 1).

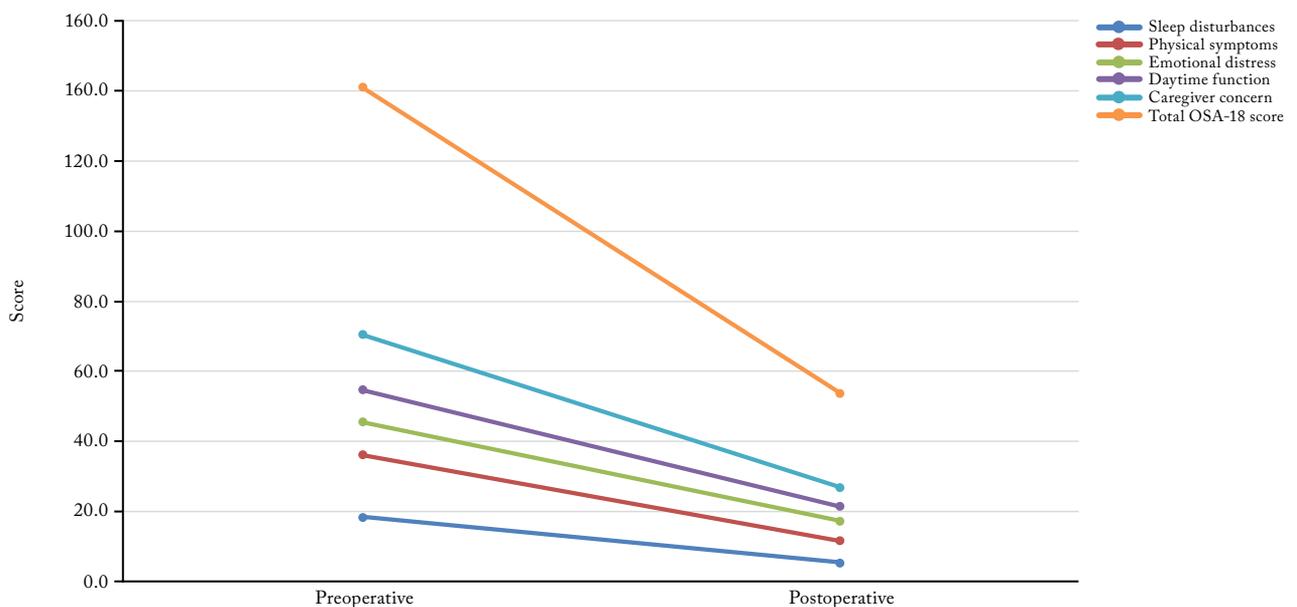
Preoperatively, the impact of sleep-related breathing disorder on quality of life was average in 57 cases, moderate in 71 cases, and severe in 58 cases based on the OSA-18 total score. After adenotonsillectomy, it was average in 182 cases, moderate in three cases, and severe in one case (Table 5).

## DISCUSSION

Clinical medicine places a great emphasis on quality of life. For the evaluation of OSAS in children, several disease-specific quality-of-life surveys are available. The Obstructive Sleep Disorders-6 survey,<sup>[13]</sup> PSQ,<sup>[10]</sup> Tonsil and Adenoid Health Instrument,<sup>[14]</sup>

and OSA-18<sup>[9]</sup> have been developed for children suffering from OSAS. Among the most widely used quality-of-life questionnaires for pediatric OSAS, the OSA-18 questionnaire developed by Franco et al.<sup>[9]</sup> has been validated in many languages and is commonly used worldwide as an indicator of the quality of life for pediatric OSAS.<sup>[15]</sup>

During the translation and cross-cultural adaptation phase, it was necessary to make significant adaptations to the initial version of the Turkish OSA-18 questionnaire to ensure compatibility with other cultures. During this study, an analysis of the internal consistency of the Turkish version of the OSA-18 was performed. The internal consistency of an instrument determines the degree to which the scores on each item correlate.<sup>[16]</sup> A Cronbach's alpha value of 0.7 is the minimum acceptable value when representing and evaluating internal consistency. Cronbach's alpha in our study was 0.852 at the test examination and 0.857 at the retest examination,



**Figure 1.** Mean OSA-18 scores for subscales before and after adenotonsillectomy.

OSA-18: Obstructive Sleep Apnea-18.

Total OSA-18 score	Preoperative	Postoperative
<60 (average)	57	182
[60-80] (moderate)	71	3
≥80 (severe)	58	1
Total	186	186

SDB: Sleep-disordered breathing; OSA-18: Obstructive Sleep Apnea-18.

indicating strong internal consistency of the OSA-18 Turkish version. To determine the reliability of test results after repeated testing, test-retest reliability measures are used, referring to the correlation between scores obtained during the initial test and those obtained during subsequent retests. In our study, the total OSA-18 score and all subscale scores were significantly correlated between test and retest evaluations.

A test's validity is determined by its ability to accurately measure what is intended to be measured.<sup>[17]</sup> The validity of an instrument is based on its ability to distinguish between patient groups with and without the disease being studied. A comparison of OSA-18 scores with PSQ scores was used in our study to assess the validity of the OSA-18 questionnaire. The cutoff value for PSQ scores indicating pediatric obstructive sleep apnea was expected as 0.33.<sup>[11]</sup> Additionally, the OSA-18 has been evaluated for its sensitivity and specificity in detecting SDB in response to PSQ scores, the cutoff value of which is expected as 0.33 to show sleep disturbances. There was a significant correlation between the total OSA-18 scores and the scores on all five subscales, and the total OSA-18 scores were significantly higher in the group of children with PSQ scores greater than the cutoff value of 0.33.

Responsiveness refers to the capability of an instrument to detect clinical changes. Comparison of scores before and after an adenotonsillectomy is a method of evaluating responsiveness. Our study showed a remarkable decrease in the OSA-18 total score and subscale scores following adenotonsillectomy, confirming that the Turkish version of the instrument is responsive.

According to Franco et al.,<sup>[9]</sup> an OSA-18 total score of more than 60 is abnormal. Borgström et al.<sup>[18]</sup> and Kobayashi et al.<sup>[19]</sup> suggested that the OSA-18 shows inadequate specificity and sensitivity in predicting pediatric OSA. According to Kobayashi et al.,<sup>[19]</sup> a total OSA-18 cutoff score of 40 produced 100%

sensitivity compared to polysomnography. The study by Arezzo et al.<sup>[20]</sup> revealed that in the Italian version of the OSA-18 questionnaire, the specificity was 75%, and the sensitivity was 67.7% ,compared to the diagnosis derived from nocturnal pulse oximetry. The Greek version of the OSA-18 questionnaire was 83% specific and 53% sensitive in anticipating a positive polysomnography result (apnea-hypopnea index [AHI]>1).<sup>[17]</sup> It is important to note that an OSA-18 score of 60 was taken as the cutoff point in both studies mentioned above. In the Turkish version of the questionnaire, the sensitivity was 68.6%, and the specificity was 76.4%. The Turkish version of the OSA-18 questionnaire's sensitivity and specificity are similar to those of the Italian version. The total cutoff score for the OSA-18 in our study was 60.

The strength of the present study was the relatively large sample size compared to other studies that translated the original OSA-18 questionnaire into different languages.<sup>[17,20]</sup> The main limitations of the study were the absence of polysomnography evaluations, which is the most effective tool for diagnosing SDB. Franco et al.<sup>[9]</sup> had already conducted a validity and reliability analysis of the original questionnaire based on comparisons with polysomnograms. Therefore, we did not attempt to reproduce their findings but evaluated the validity and reliability of the Turkish version of the study. Moreover, we used PSQ scores instead of polysomnography to diagnose SDB in patients scheduled to undergo adenotonsillectomy. Another limitation of the study was that parents' responses might not completely capture the patients' subjective experience, which could introduce bias.

In conclusion, the results demonstrate that the Turkish OSA-18 questionnaire is an effective and reliable measure of sleep-related breathing disorders in children. Its responsiveness, consistency, and internal reliability are satisfactory. The OSA-18 questionnaire was highly sensitive in detecting SDB as diagnosed by the PSQ, with a sensitivity of 68.6%.

**Data Sharing Statement:** The data that support the findings of this study are available from the corresponding author upon reasonable request.

**Author Contributions:** Concept, design, control, data collection and/or processing, analysis and/or interpretation, literature review, writing of the article, critical review, materials: Y.G., A.C.Y., O.A., Ö.F.K.; Idea/concept, design, control/supervision, analysis and/or interpretation, literature review, critical review: S.Ş.Ö., M.D.E., F.B.; Idea/concept, design, control/supervision, data collection and/or processing, analysis and/or interpretation, literature review, critical review: G.A., J.M.; Idea/concept, design, analysis and/or interpretation, literature review, critical review: E.Y., Z.S.İ., D.Ü.

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**Appendix:** The Turkish version of the OSA-18 questionnaire

For each question below, please circle the number that best describes how often each symptom or problem has occurred during the past four weeks. Please circle only one number per question Thank you.

Aşağıdaki her soru için, lütfen son dört hafta boyunca her semptom veya sorunun ne sıklıkta ortaya çıktığını en iyi tanımlayan sayıyı yuvarlak içine alınız. Lütfen soru başına yalnızca bir rakamı yuvarlak içine alınız.  
Teşekkürler.

	None of the time <i>Hiçbir zaman</i>	Rarely any of time <i>Nadiren</i>	A little of the time <i>Ara sıra</i>	Some of the time <i>Bazen</i>	A good bit of the time <i>Sık sık</i>	Most of the time <i>Genellikle</i>	All of the time <i>Her zaman</i>
<b>Sleep disturbance</b> <i>Uyku bozukluğu</i>							
During the past 4 weeks, how often has your child had... <i>Geçen 4 haftada, çocuğunuz ne sıklıkla...</i>							
...loud snoring? <i>...yüksek sesle horladı?</i>	1	2	3	4	5	6	7
...breath holding spells or pauses in breathing at night? <i>...geceleri nefes tutma atakları veya nefes almada duraklamalar yaşadı?</i>	1	2	3	4	5	6	7
...choking or made gasping sound while asleep? <i>...uyurken boğuluyormuş gibi veya nefes nefese ses çıkardı?</i>	1	2	3	4	5	6	7
...restless sleep or frequent awakenings from sleep? <i>...huzursuz uyudu veya sık sık uykudan uyandı?</i>	1	2	3	4	5	6	7
<b>Physical symptoms</b> <i>Fiziksel semptomlar</i>							
During the past 4 weeks, how often has your child had... <i>Geçen 4 haftada, çocuğunuz ne sıklıkla...</i>	1	2	3	4	5	6	7
...mouth breathing because of nasal obstruction? <i>...burun tıkanıklığına bağlı ağızdan nefes aldı?</i>	1	2	3	4	5	6	7
...frequent colds or upper respiratory infections? <i>...üşüttü veya üst solunum yolları enfeksiyonu geçirdi?</i>	1	2	3	4	5	6	7
...nasal discharge or a runny nose? <i>...burun akıntısı vardı?</i>	1	2	3	4	5	6	7
...difficulty in swallowing foods? <i>...gıdaları yutmada zorluk çekti?</i>							
<b>Emotional symptoms</b> <i>Duygusal semptomlar</i>							
During the past 4 weeks, how often has your child had... <i>Geçen 4 haftada, çocuğunuz ne sıklıkla...</i>							
...mood swings or temper tantrums? <i>...ani ruh hali değişiklikleri veya öfke krizi yaşadı?</i>	1	2	3	4	5	6	7
...aggressive or hyperactive behavior? <i>...agresif ve hiperaktif davranışlar sergiledi?</i>	1	2	3	4	5	6	7
...discipline problems? <i>...disiplin problemleri yaşadı?</i>	1	2	3	4	5	6	7
<b>Daytime function</b> <i>Günlük fonksiyonlar</i>							
During the past 4 weeks, how often has your child had... <i>Geçen 4 haftada, çocuğunuz ne sıklıkla...</i>							
...excessive daytime sleepiness? <i>...gün içerisinde aşırı uyukuluydu?</i>	1	2	3	4	5	6	7
...poor attention span or concentration? <i>...konsantrasyon olmada zorluk çekti?</i>	1	2	3	4	5	6	7
...difficulty getting out of bed in the morning? <i>...sabahları yatağından kalkmada zorluk çekti?</i>	1	2	3	4	5	6	7
<b>Caregiver concern</b> <i>Bakımveren endişeleri</i>							
During the past 4 weeks, how often has your child had... <i>Geçen 4 haftada, yukarıdaki problemler ne sıklıkla...</i>							
...caused you to worry about your child's general health? <i>...çocuğunuzun sağlığı hakkında endişelenmenize sebep oldu?</i>	1	2	3	4	5	6	7
...created concern that your child is not getting enough air? <i>...çocuğunuzun yeterli kadar hava alamadığı konusunda sizi endişelendirdi?</i>	1	2	3	4	5	6	7
...interfered with your ability to perform Daily activities? <i>...günlük işlerinizi yapmanıza engel oldu?</i>	1	2	3	4	5	6	7
...made you frustrated? <i>...sizi yılmış hissettirdi?</i>	1	2	3	4	5	6	7