



The Knowledge-Attitude-Practice of Parents Towards Children Snoring Scale: A Turkish Validity and Reliability Study

Ebeveynlerin Çocukların Horlamasına İlişkin Bilgi-Tutum-Uygulamalarının Değerlendirilmesi Ölçeği: Türkçe Geçerlik ve Güvenirlik Çalışması

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Abstract

Objective: The aim of this study was to adapt the Knowledge-Attitude-Practice of Parents Towards Children Snoring scale into Turkish and evaluate its validity and reliability. Considering the negative impacts of childhood snoring on physical, cognitive, and emotional development, assessing parental awareness using a culturally appropriate and psychometrically sound instrument is of great importance.

Materials and Methods: This methodological study involved the translation of the original 25-item scale into Turkish, followed by expert evaluation of content validity. Data were collected online from 201 parents with children aged 1–18 years. The number of participants was approximately eight times the number of scale items, yielding a sufficient sample size. Data analysis include exploratory factor analysis, confirmatory factor analysis, item-total score correlations, Cronbach's alpha coefficients, and test-retest reliability assessments.

Results: The Turkish version of the scale demonstrated high content validity (content validity index = 0.92) and internal consistency (Cronbach's α = 0.95). Factor analyses confirmed the original 4-factor structure, explaining 76% of the total variance. Item-total correlations ranged between 0.36 and 0.80. Test-retest results indicated strong temporal stability. Among participants, 53.7% reported having prior knowledge about childhood snoring, while 32.3% had consulted a physician about their child's snoring.

Conclusion: The Turkish version of the scale is a valid and reliable instrument for evaluating parental knowledge, attitudes, and practices related to childhood snoring. It can serve as a valuable tool in clinical and research settings to plan interventions aimed at increasing parental awareness and facilitating early diagnosis and treatment.

Keywords: Snoring, parents, child, questionnaires, validity and reliability

Öz

Amaç: Bu çalışmanın amacı, Ebeveynlerin Çocukların Horlamasına İlişkin Bilgi-Tutum-Uygulamalarının Değerlendirilmesi ölçeği'nin Türkçe'ye uyarlanması ve ölçeğin geçerlik ile güvenilirlik analizlerinin yapılmasıdır.

Gereç ve Yöntem: Metodolojik desenle yürütülen bu çalışmada, 25 maddeden oluşan orijinal ölçek Türkçe'ye çevrilmiş ve kapsam geçerliliği için uzman görüşlerine başvurulmuştur. Verilerin toplanması çevrim içi olarak gerçekleştirilmiş ve çalışmaya 1–18 yaş arası çocuğu olan 201 ebeveyn katılmıştır. Katılımcı sayısı, ölçek madde sayısının yaklaşık sekiz katı olup, örneklem büyüklüğü araştırma için yeterli kabul edilmektedir. Verilerin analizinde açıklayıcı faktör analizi, doğrulayıcı faktör analizi, madde-toplam puan korelasyonları ve Cronbach's alfa katsayısı kullanılmıştır. Test-tekrar test yöntemiyle ölçüm tutarlılığı değerlendirilmiştir.

Bulgular: Ölçeğin Türkçe formu yüksek kapsam geçerliliği (kapsam geçerlik indeksi =0,92) ve iç tutarlılık (Cronbach's α = 0,95) göstermiştir. Faktör analizleri sonucunda ölçek dört faktörlü yapısını korumuş ve toplam varyansın %76'sını açıklamıştır. Madde-toplam korelasyonları 0,36–0,80 arasında değişmiştir. Test-tekrar test sonuçları, zamanlar arası tutarlılığı desteklemiştir. Katılımcıların %53,7'si çocuklarda horlama hakkında bilgi sahibi olduğunu belirtmiş, %32,3'ü ise horlayan çocuklarını doktora götürdüğünü ifade etmiştir.

Sonuç: Ölçeğin Türkçe versiyonu, ebeveynlerin çocuk horlamasına ilişkin bilgi, tutum ve uygulamalarını geçerli ve güvenilir şekilde değerlendirebilecek bir araçtır.

Anahtar Kelimeler: Horlama, ebeveynler, çocuk, anketler, geçerlik ve güvenilirlik

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Received/Geliş Tarihi: 14.10.2025 Accepted/Kabul Tarihi: 05.01.2026 Epub: 20.08.2026 Publication Date/Yayınlanma Tarihi: 14.09.2026

Cite this article as: Erdoğan Ç, Karataş P. The knowledge-attitude-practice of parents towards children snoring scale: a Turkish validity and reliability study. J Turk Sleep Med. 2026;13(3):160-165



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Introduction

Childhood is a critical developmental period, and snoring during this stage can negatively affect a child's brain development, learning capacity, and emotional regulation. The prevalence of snoring in children is reported to be 27% and is increasing due to genetic and environmental factors. The most common risk factors for snoring in children include adenotonsillar hypertrophy, inflammation in the nasal cavity, and obesity. If not identified early, snoring can adversely impact physical, cognitive, and behavioral development (1-7). Parents of children with snoring problems more frequently report issues such as attention difficulties, sleep disturbances, social challenges, learning difficulties, oppositional behaviors, impulsivity, anxiety, or depressive symptoms (8-12).

As primary caregivers with the opportunity to closely observe their child's health, parents play a crucial role in the early recognition of snoring and its possible consequences (13). Therefore, parents' knowledge, attitudes, and practices can directly influence awareness of childhood snoring and healthcare-seeking behaviors (14).

In the international literature, several scales have been developed and psychometrically validated to assess parents' knowledge, attitudes, and practices regarding childhood snoring (15). However, a validated Turkish version of these instruments is currently unavailable, necessitating cultural adaptation. Developing a Turkish-adapted version of a scale to assess parental awareness of childhood snoring would provide a significant contribution to both clinical practice and academic research. Therefore, this study aimed to adapt the Knowledge-Attitude-Practice of Parents towards Children Snoring scale (KAP-PCS) into Turkish and evaluate its cultural relevance, validity, and reliability. The adapted version is intended to serve as a reliable and valid instrument for measuring the knowledge, attitudes, and behaviors of parents in the Turkish population toward childhood snoring.

Materials and Methods

This methodological study aimed to assess the reliability and validity of the Turkish adaptation of the KAP-PCS. Prior to initiating the study, ethical approval was secured from the Non-Invasive Clinical Research Ethics Committee of Pamukkale University (approval no: E-60116787-020-748239, date: 03.09.2025). Additionally, email permission was obtained from the original developers of the scale to carry out its Turkish adaptation and to perform validity and reliability testing. The ethical guidelines defined in the Declaration of Helsinki (2008) were strictly followed during the execution of this research.

The study was conducted online using Google Forms, recruiting parents from different regions of Türkiye through social media platforms (e.g., Instagram, Facebook, WhatsApp). The study sample included parents who met the eligibility criteria and volunteered to take part in the research. Inclusion criteria were defined as: residing in Türkiye, having a child between the ages of 1 and 18, and owning a device with internet access.

The online data collection form administered to parents included a description of the study's purpose and significance. Participants were informed that they could proceed to the questionnaire only if they voluntarily agreed to participate by ticking the consent checkbox provided on the form.

In methodological research, it is commonly recommended that the sample size be 5 to 10 times the number of items in the scale. Since the instrument used in this study comprises 25 items, a sample size of 201 parents corresponds to approximately 8 times the number of items, thereby fulfilling the statistical adequacy criteria (16,17).

Data Collection Tools

Study data were collected using a sociodemographic information form and the KAP-PCS.

Sociodemographic Information Form: The form included 12 items designed to collect demographic and background information related to the parents (e.g., their age, gender, educational background, occupation, socioeconomic status, number of children, and family structure), as well as specific details about the child, including their age, gender, and snoring history.

KAP-PCS: Originally developed by Guo et al. (18), this scale comprises 25 items distributed across 4 subscales: knowledge, attitudes, practices, and awareness. In the original validation study, the 4-factor model accounted for 61.4% of the total variance, and the Cronbach's alpha coefficient was reported as 0.93, demonstrating high internal consistency. The scale is structured as a five-point Likert-type instrument. In the first two subscales, response options range from "don't know at all" (1) to "know all" (5). The items in the remaining two subscales are scored on a five-point Likert scale, with options ranging from "strongly disagree" (1) to "strongly agree" (5). The total score is calculated as the mean of all 25 items, resulting in a range from 1 to 5. Higher scores reflect higher levels of knowledge and more favorable attitudes and practices regarding childhood snoring.

Statistical Analysis

The study data were analyzed using IBM SPSS Statistics 25 and STATA software. To evaluate content validity, Kendall's W coefficient was calculated to assess the consensus among expert opinions. For construct validity, the suitability of the data for exploratory factor analysis (EFA) was examined using the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity. EFA was conducted using principal component analysis with varimax rotation. Reliability was assessed through Cronbach's alpha coefficients and item-total correlation analyses.

Validity and Reliability of the Scale

Language and Content Validity

In the initial stage, the original scale items were translated into Turkish by individuals with native-level proficiency in English. To ensure semantic and conceptual equivalence, the original and translated versions were reviewed by a group of bilingual experts. The Turkish version was then back-translated

into English by two independent native English speakers with advanced proficiency in Turkish. The researchers compared the original scale, the Turkish translation, and the back-translated versions to evaluate consistency of meaning, conceptual equivalence, and cultural appropriateness, ultimately reaching a consensus on a final Turkish draft.

Following linguistic validation, content validity was assessed. The finalized Turkish version and the original English version of the scale were sent to five academic experts in the field of pediatric nursing. The experts were asked to evaluate each item in terms of its appropriateness by comparing the Turkish translation with the original version. The content validity index (CVI) was used to analyze the expert evaluations. A high level of agreement was observed among the experts, with a CVI of 0.92 (19).

Based on expert feedback, items deemed inappropriate or problematic in terms of linguistic compatibility were revised by the researchers, and the final Turkish version of the scale was created.

Construct Validity

Factor analysis was utilized to assess construct validity. Data suitability for factor analysis was first verified using the KMO measure and Bartlett's test of sphericity. EFA was then conducted to explore the underlying factor structure of the scale, followed by confirmatory factor analysis (CFA) to evaluate how well the identified model fit the data.

Internal Consistency Reliability

Internal consistency was evaluated to examine the extent to which the scale items and its subscales consistently measure the targeted constructs. For this purpose, Cronbach's alpha (α) coefficient was computed, with values of 0.70 or higher regarded as indicative of acceptable reliability (20). Additionally, item-total score correlations were analyzed to evaluate the discriminative power of the items, with coefficients below 0.20 generally considered grounds for item exclusion (19). "Cronbach's alpha if item deleted" was also calculated to assess whether the removal of any individual item would meaningfully improve the overall reliability of the scale.

Results

Descriptive Characteristics of the Participants

The mean age of the participating parents was 38.04 ± 8.32 years. The mean age of their children was 7.05 ± 3.77 years, and the average number of children per parent was 2.04 ± 0.87 . Among the participants, 87.6% were female and 41.8% were university graduates. Additionally, 42.8% of the parents reported that they were not employed, while 57.2% stated that their income was above the minimum wage level. Most parents (86.6%) reported having a nuclear family structure, and 54.2% reported that their child was male. When asked about childhood snoring, 53.7% of the parents stated that they had prior knowledge of it and 55.2% regarded childhood snoring as a sign of illness. Additionally, 64.7% of the parents reported a history of snoring in their child and 32.3% had consulted a physician about their child's snoring (Table 1).

Table 1. Distribution of sociodemographic characteristics of parents participating in the study (n = 201).

Sociodemographic characteristics	Mean	SD
Parent age (years)	38.04	8.32
Childage (years)	7.05	3.77
Number of children	2.04	0.87
	n	%
Gender		
Female	176	87.6
Male	25	12.4
Education level		
Primary school	20	10.0
Secondary school	33	16.4
High school	39	19.4
University	84	41.8
Master's/doctorate	25	12.4
Employment status		
Not employed	86	42.8
Public sector employee	47	23.4
Private sector/wage worker	13	6.5
Self-employed	18	9.0
Other	37	18.4
Income level		
Less than minimum wage	31	15.4
Equal to minimum wage	55	27.4
More than minimum wage	115	57.2
Family type		
Nuclear	174	86.6
Extended	14	7.0
Single family	13	6.5
Child's gender		
Female	92	45.8
Male	109	54.2
Has prior knowledge of childhood snoring	108	53.7
Has consulted physician about child's snoring	65	32.3
Thinks snoring in children is a sign of illness	111	55.2

n: Number of participants, %: Percentage, SD: Standard deviation.

Psychometric Properties of the Scale

Item Analysis

The item-total correlations for all items on the KAP-PCS ranged from 0.36 to 0.80 (Table 2). All coefficients exceeded the recommended threshold of 0.20, demonstrating adequate discriminative power. Furthermore, the removal of individual items did not lead to any notable increase in Cronbach's alpha values, indicating that each item contributes consistently to

the overall scale reliability. Therefore, based on these statistical findings and theoretical considerations, no items were removed from the scale.

Internal Consistency

The KAP-PCS demonstrated strong reliability, with an overall Cronbach's alpha value of 0.95. For the individual subscales, Cronbach's alpha coefficients ranged from 0.88 to 0.95,

indicating excellent reliability and homogeneity across all measured constructs (Table 2).

Test-Retest Reliability

No statistically significant difference was observed between the mean total scores on the KAP-PCS across the two separate administrations (3.21 ± 0.41 vs. 3.24 ± 0.52 ; $p > 0.05$), indicating strong temporal stability.

Construct Validity

The data demonstrated excellent suitability for factor analysis, yielding a KMO value of 0.91 and a significant Bartlett's test of sphericity ($p < 0.001$) (21). EFA revealed an unconstrained four-factor structure, each factor with an eigenvalue of 2 or higher. Consistent with the original scale, the four-factor model accounted for 76% of the total variance. In this study, all item loadings ranged from 0.34 to 0.87, above the recommended minimum threshold of 0.30 (22). Therefore, no items were excluded from the scale (Table 3).

Table 2. Item analysis and internal consistency results of the KAP-PCS.

Items	Total correlation	Cronbach's alpha if item deleted
Subscale 1		
S1	0.59	0.94
S2	0.59	0.94
S3	0.58	0.95
S4	0.54	0.95
S5	0.71	0.94
S6	0.68	0.94
Cronbach's alpha	0.88	
Subscale 2		
S1	0.42	0.95
S2	0.36	0.95
S3	0.48	0.95
S4	0.48	0.95
S5	0.52	0.95
Cronbach's alpha	0.88	
Subscale 3		
S1	0.78	0.94
S2	0.79	0.94
S3	0.76	0.94
S4	0.82	0.94
S5	0.68	0.94
S6	0.73	0.94
Cronbach's alpha	0.94	
Subscale 4		
S1	0.76	0.94
S2	0.77	0.94
S3	0.77	0.94
S4	0.80	0.94
S5	0.76	0.94
S6	0.71	0.95
S7	0.54	0.94
S8	0.66	0.94
Cronbach's alpha	0.95	
Total Cronbach's alpha	0.95	

Item-total correlation = correlation between each item and the total scale score; Cronbach's alpha if item deleted = internal consistency coefficient obtained when the relevant item is removed; α = Cronbach's alpha coefficient, KAP-PCS: Knowledge-Attitude-Practice of Parents towards Children Snoring scale.

Table 3. Main Factors of the KAP-PCS.

Items	Factor loadings			
	Factor 1	Factor 2	Factor 3	Factor 4
Item 1	0.76			
Item 2	0.79			
Item 3	0.80			
Item 4	0.51			
Item 5	0.71			
Item 6	0.56			
Item 7		0.79		
Item 8		0.87		
Item 9		0.82		
Item 10		0.77		
Item 11		0.74		
Item 12			0.38	
Item 13			0.34	
Item 14			0.39	
Item 15			0.66	
Item 16			0.43	
Item 17			0.37	
Item 18				0.44
Item 19				0.63
Item 20				0.64
Item 21				0.53
Item 22				0.48
Item 23				0.61
Item 24				0.72
Item 25				0.83

Factor loadings represent the correlation between each item and its corresponding factor. Only factor loadings ≥ 0.30 are reported. Factor extraction was performed using exploratory factor analysis with varimax rotation, KAP-PCS: Knowledge-Attitude-Practice of Parents towards Children Snoring scale.

CFA Results

CFA evaluated the 25-item, 4-factor model of the KAP-PCS. The log-likelihood value was calculated as -6438.61. All item factor loadings in the model were significant, and error variances remained within acceptable ranges. Additionally, covariances between the factors were positive and significant, indicating strong inter-factor relationships. The likelihood ratio test showed a significant difference compared to the saturated model ($\chi^2(269) = 1280.28$, $p < 0.001$). These findings confirm that the four-factor structure strongly fits the data, further supporting the construct validity of the scale (Table 4).

Discussion

This study involved the Turkish adaptation of the KAP-PCS and the examination of its validity and reliability. The results demonstrated that the Turkish version of the scale possesses sound psychometric properties.

Descriptive findings revealed that the vast majority of participating parents were female and belonged to nuclear families. Additionally, more than half of the parents had prior knowledge about childhood snoring, yet only 32.3% of parents had consulted a physician about their child's snoring. This suggests a potential gap between parents' awareness levels and their actual practices.

Regarding content validity, expert opinions were obtained from five faculty members in the field of pediatric nursing, and a high level of agreement was achieved. Consequently, it was concluded that the scale items are culturally suitable and effective for assessing parents' knowledge, attitudes, and practices related to childhood snoring.

The analyses of item characteristics, internal consistency, and test-retest reliability demonstrated that the KAP-PCS is a highly reliable measurement tool. Item-total correlation coefficients ranged from 0.36 to 0.80, all safely exceeding the threshold of 0.20 (20). The decision to retain all 25 items in the scale was

based on both these empirical findings and theoretical relevance. Statistically, all items demonstrated sufficient discriminative power and satisfactory factor loadings. Conceptually, removing any item could weaken the content coverage of the underlying construct. Furthermore, test-retest results indicated strong stability over time with minimal random measurement error.

The KAP-PCS demonstrated strong internal consistency, with an overall Cronbach's alpha of 0.95 and subscale values ranging from 0.88 to 0.95. These findings align closely with the original validation study, which reported an overall alpha of 0.93 (16). Based on the Cronbach's alpha threshold of 0.70 generally considered acceptable for reliability in scale adaptation studies, (23,24,25) the high alpha values observed in this study affirm the scale's robust internal consistency. Construct validity was similarly robust. Following confirmation of the data's suitability for factor analysis ($KMO = 0.91$; $p < 0.001$), EFA and CFA both supporting a 4-factor structure that accounted for 76% of the total variance. Furthermore, the positive and significant covariances among the factors indicate that the relevant subscales are theoretically consistent and closely interrelated (25).

These results indicate that the Turkish adaptation of the KAP-PCS is a dependable instrument for evaluating parents' knowledge, attitudes, and practices concerning childhood snoring. This tool will be highly valuable in both clinical practice and research for evaluating parental awareness, identifying at-risk children, and planning targeted health education interventions.

Study Limitations

This study has certain limitations. First, data collection was conducted solely online, potentially excluding individuals without internet access and restricting the generalizability of the results. Second, the sample predominantly consisted of mothers (87.6%), which may not fully capture the views of other caregivers, such as fathers. Third, the use of self-reported data may have led to social desirability bias in the responses.

Table 4. Summary Table of the CFA Model for the KAP-PCS.

Parameter	Coefficient	Std. error	z	p	95% CI	
					Lower	Upper
Latent F1	0.997	0.158	–	–	0.730	1.361
Latent F2	1.341	0.225	–	–	0.965	1.863
Latent F3	1.383	0.165	–	–	1.094	1.748
Latent F4	1.195	0.138	–	–	0.952	1.499
cov(F1,F2)	0.691	0.118	5.86	<0.001	0.460	0.922
cov(F1,F3)	0.795	0.117	6.80	<0.001	0.566	1.024
cov(F1,F4)	0.618	0.101	6.13	<0.001	0.420	0.816
cov(F2,F3)	0.395	0.111	3.55	<0.001	0.177	0.614
cov(F2,F4)	0.297	0.100	2.96	0.003	0.100	0.494
cov(F3,F4)	1.199	0.135	8.87	<0.001	0.934	1.463
LR test vs. saturated model	$\chi^2(269) = 1280.28$	–	–	<0.001	–	–
Log-likelihood	-6438.61	–	–	–	–	–

CFA: Confirmatory factor analysis, F1–F4: Latent factors, cov: Covariance between latent factors, Std: Standard deviation, CI: Confidence interval, LR: Likelihood ratio test. All reported covariances were statistically significant, KAP-PCS: Knowledge-Attitude-Practice of Parents towards Children Snoring scale.

Furthermore, test-retest reliability was evaluated over a brief interval with a small subsample, leaving the long-term temporal stability of the scale unexamined. Finally, because the validation was conducted exclusively among Turkish-speaking parents in Türkiye, the findings may not be directly applicable to other cultural or regional populations.

Conclusion

This study successfully adapted the KAP-PCS into Turkish and established its validity and reliability for use in this population. Comprehensive psychometric testing, including expert content assessment, factor analyses (EFA and CFA), and test-retest evaluations, confirmed a four-factor structure accounting for 76% of the total variance. With excellent internal consistency (Cronbach's alpha of 0.95) and strong temporal stability, the Turkish version of the KAP-PCS is a highly dependable instrument. Therefore, it can be effectively used in both clinical practice and academic research to assess parents' knowledge, attitudes, and practices related to childhood snoring.

Ethics

Ethics Committee Approval: Prior to initiating the study, ethical approval was secured from the Non-Invasive Clinical Research Ethics Committee of Pamukkale University (approval no: E-60116787-020-748239, date: 03.09.2025).

Informed Consent: Participants were informed that they could proceed to the questionnaire only if they voluntarily agreed to participate by ticking the consent checkbox provided on the form.

Footnotes

Authorship Contributions

Concept: Ç.E., Design: Ç.E., Data Collection or Processing: Ç.E., P.K., Analysis or Interpretation: Ç.E., P.K., Literature Search: Ç.E., P.K., Writing: Ç.E., P.K.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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