

## ORIGINAL ARTICLE

# Turkish Reliability and Validity of the Respiratory Symptom Experience Scale

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## Main Points

- This is the first Turkish cross-culturally adapted scale designed to assess respiratory symptoms experienced by smokers.
- The four-item Turkish version of the Respiratory Symptom Experience Scale (RSES) demonstrates satisfactory reliability ( $\alpha$  score = 0.753)
- The four-item Turkish version of the RSES may be useful in the early diagnosis of chronic obstructive pulmonary disease in smokers by raising awareness of respiratory symptoms.

## Abstract

The objective of this study was to adapt the Respiratory Symptom Experience Scale for use in Turkish and to assess its reliability and validity among smokers. The study included 90 smokers aged 28 – 64 from Bitlis Province, with a mean age of  $43.92 \pm 7.82$ , of whom 26.6% were women. Initially, the scale was translated forward and backward. The finalized version was then administered to participants in person. To determine the internal consistency and construct validity of the scale, internal consistency analysis, exploratory factor analysis, and confirmatory factor analysis were conducted. The Turkish version of the four-item Respiratory Symptom Experience Scale demonstrated adequate reliability with a Cronbach's  $\alpha$  of 0.753. Test – retest reliability, assessed 1-week interval, further confirmed the scale's consistency. However, the third item was removed from the scale due to its negative impact on the goodness of fit index in the confirmatory factor analysis. The Turkish version of the four-item Respiratory Symptom Experience Scale is a reliable and valid instrument for assessing respiratory symptoms in smokers.

**Keywords:** Addiction, reliability, smoking, validity

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Received: July 29, 2024

Revision Requested:

October 23, 2024

Last Revision Received:

October 28, 2024

Accepted: November 17,

2024

Publication Date: May 2,

2025

## Introduction

Cigarette smoking is a highly addictive routine due to nicotine (El-Boraie & Tyndale, 2021) and poses a significant health concern (Sharma et al., 2021). Reflecting its highly addictive nature, over one billion individuals smoke worldwide (Centner et al., 2020). Globally, one in four men and one in twenty women smoke (Collaborators, 2017). In Türkiye, smoking rates are even higher, with approximately half of the men (46.1%) and nearly one-fifth of the women (15.7%) identified as smokers, resulting in one-third of the general population (30.5%) smoking (Özer et al., 2018).

Cigarettes, which contain thousands of chemicals and numerous carcinogenic substances (Hecht, 2003), provoke both acute and chronic inflammatory responses (Ji et al., 2021), leading to cardiovascular and cardiopulmonary diseases (Yayan et al., 2024). One significant consequence of smoking is chronic obstructive pulmonary disease (COPD), characterized by respiratory symptoms and airflow limitation (Vogelmeier et al., 2017). COPD is a major global health concern (Sharma et al., 2021) due to its widespread prevalence (~12%) (Adeloye et al., 2015), along with its associated morbidity (Yayan et al., 2024) and mortality (Murray & Lopez, 1997). The substantial global burden of COPD underscores



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Cite this article as: Dursun, Ö., & Önen, C. (2025). Turkish reliability and validity of the respiratory symptom experience scale. *Addicta: The Turkish Journal on Addictions*, 12(2), 145-150.

the urgent need for effective prevention and treatment strategies (Lin et al., 2022).

Previously developed self-reported scales and questionnaires for COPD patients may be viewed as a response to this pressing need. These self-reported assessment tools are specifically designed and validated to assess respiratory symptoms experienced by COPD patients (Birring et al., 2003; Jones et al., 2009; Jones et al., 1991; van der Molen et al., 2003). However, these tools generally assess symptoms without distinguishing the underlying pathology of COPD development. Moreover, since COPD is predominantly diagnosed in individuals aged 40 and older (Labaki & Rosenberg, 2020) these tools may indirectly target a specific age range. Such limitations restrict the applicability of these assessment tools to smokers (Shiffman et al., 2023), who represent a primary risk group for COPD (Sharma et al., 2021) and exhibit a similar symptom cluster and similar prognosis with COPD (Yayan et al., 2024). The Respiratory Symptom Experience Scale (RSES) is an assessment tool specifically developed to address the need arising from this query (Shiffman et al., 2023).

Although the proportion of smokers is decreasing in most countries worldwide, the lack of significant reduction in countries within the eastern Mediterranean region, including Türkiye (Ruvuna & Sood, 2020), and the concerning high smoking rates in Türkiye (Özer et al., 2018) highlight the need to assess the respiratory symptoms experienced by smokers. This study aimed to perform the cross-cultural adaptation of the RSES in Turkish and assess its reliability and validity in smokers.

## Material and Methods

This study was carried out in Bitlis Province between April 2024 and June 2024, with approval from the Ethics Committee of Bitlis Eren University (Approval no.2024 / 03-22 ; Date: 29 / 03 / 2024). The participants were recruited from the general population residing in the province of Bitlis. Individuals were reached using the snowball sampling method. Participants were verbally informed and provided written consent before enrollment. Authorization was also obtained from the author of the original scale. Sample size was determined in accordance with the number of items in the RSES, following the guideline of including five to ten participants per item (Terwee et al., 2007). The study targeted individuals aged 28 and older who had been smoking for at least 10 years. Exclusion criteria were having a first-degree relative currently or previously working in the tobacco industry, a household member engaged in legal action against a tobacco company, recent participation in tobacco-related research, or experiencing cold or flu-like symptoms in the past month (Shiffman et al., 2023). Out of 96 individuals assessed for eligibility, 90 were included. Six individuals were excluded for being under 28 years of age ( $n = 1$ ) or having smoked for less than 10 years ( $n = 5$ ). Sociodemographic and smoking-related information of the participants was also collected.

The RSES, developed by Shiffman et al. (2023), is a unidimensional tool designed to evaluate respiratory symptoms in smokers over the past month. This scale consists of five items, each addressing potential respiratory symptoms experienced by smokers, with responses captured on a five-point Likert scale. The overall score is derived by averaging the responses across all

items. If any item is left unanswered, the composite score is not calculated. The Turkish version consists of four items: “morning cough,” “cough frequently,” “easily winded,” and “wheezing.” Each item is scored on a scale from 1 to 5. The scores given by participants for each item are summed and then divided by four to calculate the composite score. Higher scores indicate a greater frequency of respiratory symptoms.

For the initial phase of cross-cultural adaptation and validation, two different translators translated the original scale from English into Turkish. To ensure equivalence between the two versions, both forward and backward translations were performed. The first draft of the Turkish version was then created based on these translations and subsequently evaluated by a Turkish language expert. An expert committee, composed of five physiotherapists holding Ph.D. degrees, reviewed the draft for semantic, idiomatic, experiential, and conceptual equivalence, as well as readability. Revisions were made until all experts reached consensus on the revised version of the scale. To enhance sentence structure, clarity, and fluency, the first, fourth, and fifth items were adjusted. The scale’s final version was established after experts reached a consensus on all aspects.

Following the development of the final version of the scale, its reliability was assessed through both internal consistency and the test – retest method. To evaluate test – retest reliability, the scale was administered to 50 smokers with a 1-week interval between assessments. Internal consistency was classified according to the previously determined criteria established by Koo and Li (2016).

The construct validity of the scale was assessed using both exploratory and confirmatory factor analyses, conducted on a sample of 90 smokers. Prior to these analyses, the Kaiser-Meyer-Olkin (KMO) test was performed, yielding a value of 0.755, which indicates good sample adequacy (Almeida et al., 2022). Additionally, the Bartlett’s test of sphericity produced a chi-square value of 91.13 ( $df = 6$ ;  $p < .001$ ), supporting the suitability of the data for factor analysis.

## Statistical Analysis

Confirmatory factor analysis was conducted using SPSS Amos (IBM SPSS Corp.; Armonk, NY, USA). The factor structure of the RSES was identified through exploratory factor analysis, employing principal component analysis. Given the unidimensional nature of the scale, no rotation method was applied during the exploratory factor analysis. Internal consistency and the scale’s correlation were evaluated using Cronbach’s alpha coefficient and Pearson correlation analysis, respectively. The normality of the scale’s distribution was assessed through skewness and kurtosis values. The values obtained range from  $-0.622$  –  $0.891$ . Additionally, it was evaluated visually using a histogram graph. The intra-class correlation coefficient analysis was used to assess test – retest reliability. The receiver operating characteristic (ROC) curve was used to determine appropriate cut-off values. Reliability was examined through both internal consistency analysis and the test – retest method. The significance threshold was set at  $p < .05$ .

## Results

Nearly one-third of the participants were under the age of 40 (31.1%), and the average smoking duration among

**Table 1.**  
*Sociodemographic Characteristics of the Participants*

		<i>n</i>	%
Age (years)	<40	28	31.1
	40 – 49	41	45.6
	≥50	21	23.3
Average age (years) = 43.92, standard deviation = 7.82			
Gender	Male	67	74.4
	Female	23	25.6
Marital status	Single	17	18.9
	Married	73	81.1
Educational background	Primary/secondary school degree	16	17.8
	High school degree	29	32.2
	Associate degree	11	12.2
	Bachelor's degree	24	26.7
	Postgraduate degree	10	11.1
Income status (₺)	≤30 000	26	28.9
	30 000 – 40 000	39	43.3
	>40 000	25	27.8
Average income (₺) = 36.730, standard deviation = 14.072			
Working status	Not working	4	4.4
	Working	86	95.6

Note: ₺ = Turkish lira.

individuals was over 20 years ( $23.94 \pm 9.15$  years). More than three-quarters of the participants were married (81.1%), and the majority were male (74.4%). The average income of the participants was more than twice the minimum wage. Half of the participants held an associate degree or higher, and nearly all (95.6%) were employed (Table 1).

Cigarettes were the most frequently used tobacco product among the participants, with 66.7% reporting cigarette consumption. More than half of the participants (64.4%) were considering quitting smoking, while nearly half (44.4%) had made concrete attempts to quit. Nearly one-fifth of the participants had a

chronic illness (17.8%,  $n = 16$ ). The most common chronic illness was COPD (6.7%,  $n = 6$ ), followed by chronic bronchitis (5.6%,  $n = 5$ ), asthma (5.6%,  $n = 5$ ) and allergies (5.6%,  $n = 5$ ), each with similar prevalence. The composite RSES score of the participants was  $1.83 \pm 0.90$ . There was a statistically significant variation in RSES scores associated with the presence of chronic disease (Table 2).

The internal consistency of the five-item RSES was also deemed adequate, with a Cronbach's  $\alpha$  of 0.796. However, the third item was removed from the scale because it negatively impacted the goodness of fit (GOF) index in the confirmatory factor analysis. After removing this item, the internal consistency was recalculated and remained satisfactory, with a Cronbach's  $\alpha$  of 0.753. Respiratory symptom experience scale's reliability was assessed using both test – retest and internal consistency methods. The test – retest reliability was evaluated with 50 smokers over a 1-week interval, resulting in a satisfactory reliability coefficient. The test – retest reliability analysis for the Turkish version of the revised scale demonstrated high consistency across measurements. The intra-class correlation coefficient was found to be 0.924 (CI: 0.866 – 0.955) for single measures and 0.961 (CI: 0.928 – 0.977) for average measures, both with a 95% CI. The  $F$  value was 27.843, and the  $p$  value was less than .001, indicating high reliability for the measurements of the Turkish version of the scale. In the Turkish version of the scale, the lowest item – total correlation coefficient was found to be 0.717, and the highest was 0.805.

The ROC analysis for the Turkish version of the scale yielded an area under the curve of 0.796, indicating good diagnostic performance ( $p < .001$ ). A score of 1.625 was identified as the optimal cut-point for assessing self-reported respiratory symptom-relevant diagnosis among smokers, with a specificity of 69.7% and sensitivity of 78.6%.

To assess data suitability before factor analyses, we conducted the KMO test and Bartlett's test of sphericity. The KMO value was 0.755, indicating good sample adequacy. Bartlett's test of sphericity yielded a chi-square value of 91.13 ( $df = 6$ ;  $p < .001$ ), confirming that the data were appropriate for factor analysis. The original five-item RSES explained 56.7% of the variance. After the removal of the third item, the explained variance increased to 59.36%. The exploratory factor analysis revealed

**Table 2.**  
*Comparison of Participants' Characteristics Related to Smoking, Chronic Disease Status and RSES Scores*

		<i>n</i>	%	<i>t</i>	<i>p</i>	CI	
Tobacco product consumed	Cigarette	60	66.7	0.835	.406	-0.234	0.574
	Tobacco	30	33.3				
Considering quitting smoking	Yes	58	64.4	0.515	.608	-0.502	0.295
	No	32	35.6				
Previous attempt to quit smoking	Yes	40	44.4	0.48	.632	-0.291	0.477
	No	50	56.6				
Presence of chronic disease	Yes	16	17.8	3.14	.002*	-1.224	-0.275
	No	74	82.2				

\* $p < .05$  statistical significance, independent samples  $t$ -test.

**Table 3.**  
Explanatory Factor Analysis Results of the RSES

Items	Factor Load (Five Item)	Factor Load (Four Item)
Morning cough	0.663	0.728
Cough frequently	0.781	0.823
Shortness of breath	0.758	-
Easily winded	0.767	0.708
Wheezing	0.788	0.816

that the factor loadings for the Turkish version of the RSES varied between 0.708 and 0.823 (Table 3).

As previously mentioned, the third item was removed due to its adverse effect on the GOF values. The final confirmatory factor analysis results are illustrated in Figure 1. The GOF values for the confirmatory factor analysis, which fall within the recommended range, are detailed in Table 4.

**Discussion**

The results of this study revealed that the four-item RSES in Turkish demonstrates both reliability and validity as a tool for assessing respiratory symptoms in smokers.

Smokers and COPD patients share a similar prognosis and same respiratory symptom cluster (Yayan et al., 2024), which is expected given that smoking is the primary cause of COPD (Sharma et al., 2021). However, the recognition of the importance of risk factors other than smoking in the development of COPD over the past decade along with the fact that these factors contribute to COPD development in approximately half of the COPD patients (Pyszora & Lewko, 2022), has called this traditional view into question. The questioning of this traditional view has

similarly paved the way for the assessment tools used to assess respiratory symptoms experienced by both groups to be called into question as well (Shiffman et al., 2023). Existing assessment tools, specifically validated for COPD patients (Birring et al., 2003; Jones et al., 2009; Jones et al., 1991; van der Molen et al., 2003) and COPD is mostly diagnosed in individuals aged 40 and over (Labaki & Rosenberg, 2020), making them less applicable to smokers. The RSES is an assessment tool specifically developed to meet this need (Shiffman et al., 2023).

The reliability and validity of the original scale were evaluated online with smokers ( $n = 202$ ), former smokers ( $n = 200$ ), and e-cigarette users who had switched from smoking ( $n = 208$ ). The scale was reported to be a reliable and valid instrument for assessing respiratory symptoms in these populations, with both reliability and test – retest scores found to be satisfactory ( $>0.80$ ). The variance explained by the original scale was 62.7% (Shiffman et al., 2023).

Similar to the original scale, the reliability of the Turkish version of the four-item RSES was satisfactory ( $\alpha = 0.753$ ). The third item was removed due to its negative impact on the GOF and its similarity in content to the fourth item. Following this removal, an improvement was observed in the goodness of fit indices of the confirmatory factor analysis, including AGFI, SRMR, GFI, CFI, NFI, and TLI, and these indices remained at a good level. Although RMSEA did not provide a good fit, it achieved an acceptable level of fit, and the explained variance increased to 59.36%. This level of explained variance is considered acceptable for unidimensional scales, as values between 40% and 60% are deemed appropriate (Hair et al., 2019). In the Turkish version of the scale, the lowest item – total correlation coefficient was found to be 0.717, and the highest was 0.805. It is recommended that the scores for each item correlate with the total scale score, with correlation values exceeding 0.30. (Shields et al., 1989).

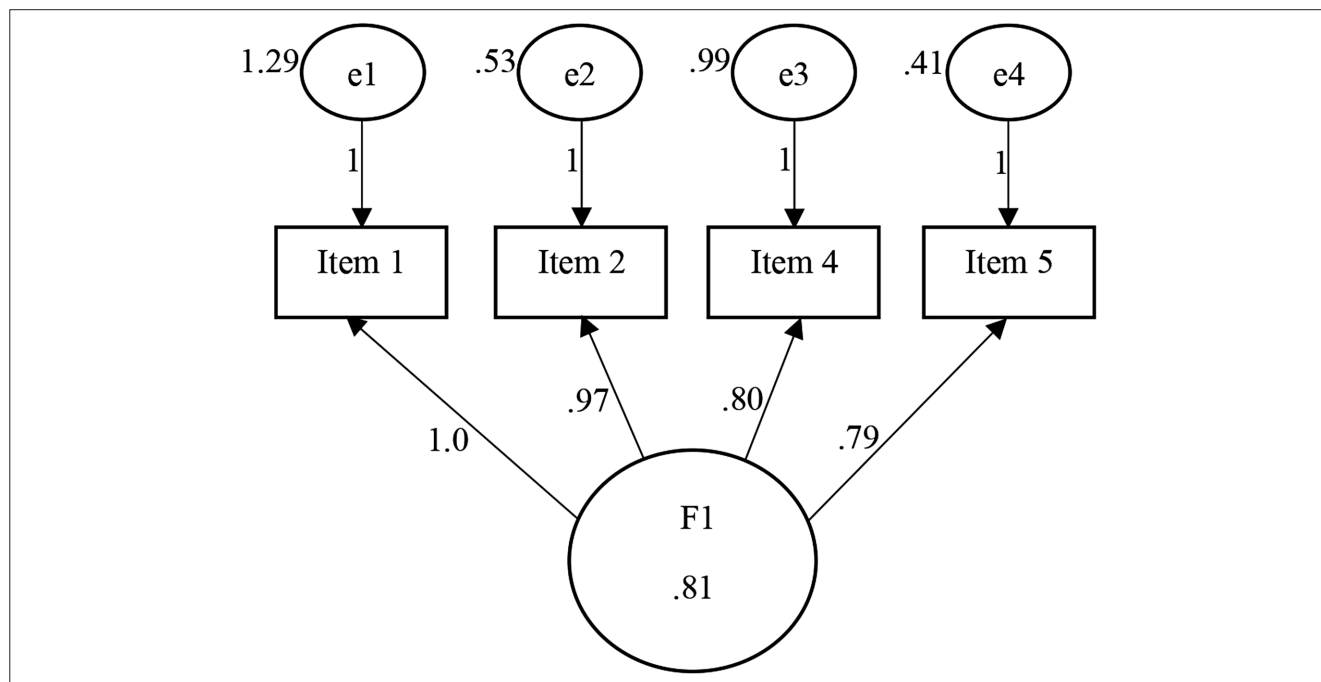


Figure 1. Confirmatory Factor Analysis Graph.

**Table 4.**  
Goodness of Fit Indexes of the Confirmatory Factor Analysis

	AGFI	GFI	CFI	NFI	TLI	RMSEA	SRMR	CMIN/DF
Recommended range	>0.85	>0.80	>0.90	>0.90	>0.90	<0.08	<0.08	–
	0.919	0.984	0.991	0.970	0.972	0.068	0.032	1.413

Note: AGFI = adjustment goodness of fit index; CFI = comparative fit index; CMIN/DF = Chi-square minimum discrepancy function by degrees of freedom; GFI = goodness of fit index; NFI = normal fit index; TLI = non-normed fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

Our study differs from that of Shiffman et al. (2023) in terms of the population for which the scale's reliability and validity were assessed. While Shiffman et al. (2023) included smokers, former smokers, and individuals who had transitioned from smoking to e-cigarettes use, our study focused exclusively on smokers. This distinction may be attributed to the legal measures in Türkiye that restrict e-cigarette use and the challenges associated with smoking cessation. The lack of legislative regulations concerning e-cigarette use in the United States has resulted in increased use, particularly among young people (Bozier et al., 2020). In Türkiye, legal regulations preventing the spread of e-cigarettes have curtailed e-cigarettes' commercialization and widespread use (Glantz, 2023). Another determining factor is the difficulty in smoking cessation, characterized in our study by the unsuccessful smoking cessation attempts in nearly half of the smokers (44.4%). The very low success rate of smokers who wish to quit (3%) (Principe et al., 2024) helps explain the challenges faced by smokers included in our study.

Although our study differs from that of Shiffman et al. (2023) in terms of population included, it is noteworthy that we achieved similar reliability and test-retest scores to those of the original scale. We attribute these comparable results to the fact that e-cigarette use has a similar effect on the respiratory system as smoking (Münzel et al., 2020) and that the inflammatory effects of smoking on the respiratory system can persist even after smoking cessation (Louhelainen et al., 2009).

The composite scale score for smokers in our study ( $1.83 \pm .90$ ) was lower than the score reported by Shiffman et al. (2023) ( $2.09 \pm 0.06$ ). This difference may be attributed to variations in the study populations. Factors such as the duration of smoking and the presence of COPD or its subtypes might account for this variability. Shiffman et al. (2023) reported a significantly higher average smoking duration ( $41.19 \pm 11.7$  years) compared to our study ( $23.94 \pm 9.15$  years). Additionally, while nearly a quarter of smokers (21.3%) in the study of Shiffman et al. (2023) had COPD or its subtypes, the prevalence of COPD or its subtypes in our study was 12.3%. The linear relationship between smoking duration and respiratory symptoms (Liu et al., 2015), along with the common occurrence of respiratory symptoms among COPD patients (Labaki & Rosenberg, 2020), supports this observation.

The study has some limitations. Due to low rate of successful smoking cessation and legal restrictions on the commercializing of e-cigarettes, former smokers and e-cigarette users were not included in the study. Consequently, changes in respiratory symptoms after smoking cessation could not be evaluated. Although the study was conducted on individuals within a nearly similar age range to the original scale study, the lack of a more specific

age range tailored to chronic conditions, particularly COPD, constitutes another limitation of the study.

In conclusion, the Turkish version of the RSES is a reliable and valid instrument for evaluating respiratory symptoms in smokers.

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

**Ethics Committee Approval:** This study was approved by the Ethics Committee of Bitlis Eren University (Approval no.2024 / 03-22 ; Date: 29 / 03 / 2024).

**Informed Consent:** Written informed consent was obtained from the participants who agreed to take part in the study.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept – Ö.D., C.Ö.; Design – Ö.D., C.Ö.; Supervision – Ö.D.; Resources – Ö.D., C.Ö.; Materials – Ö.D., C.Ö.; Data Collection and/or Processing – Ö.D., C.Ö.; Analysis and/or Interpretation – C.Ö.; Literature Search – Ö.D.; Writing – Ö.D.; Critical Review – Ö.D., C.Ö.

**Declaration of Interests:** The authors have no conflict of interest to declare.

**Funding:** The authors declared that this study has received no financial support.

## References

- A Glantz, S. (2023). Electronic cigarettes: Harm enhancement and protection of global tobacco interests. *ADDICTA: The Turkish Journal on Addictions*, *10*(3), 194 – 201. [\[CrossRef\]](#)
- Adeloye, D., Chua, S., Lee, C., Basquill, C., Papana, A., Theodoratou, E., Nair, H., Gasevic, D., Sridhar, D., Campbell, H., Chan, K. Y., Sheikh, A., Rudan, I., & Global Health Epidemiology Reference Group (GHERG) (2015). Global and regional estimates of COPD prevalence: Systematic review and meta-analysis. *Journal of Global Health*, *5*(2), 020415. [\[CrossRef\]](#)
- Almeida, L. N., Behlau, M., Ramos, N. D. S., Barbosa, I. K., & Almeida, A. A. (2022). Factor analysis of the Brazilian version of the voice-related quality of life (V-RQOL) questionnaire. *Journal of Voice*, *36*(5), 736.e17 – 736.e24. [\[CrossRef\]](#)
- Birring, S. S., Prudon, B., Carr, A. J., Singh, S. J., Morgan, M. D. L., & Pavord, I. D. (2003). Development of a symptom specific health status measure for patients with chronic cough: Leicester Cough Questionnaire (LCQ). *Thorax*, *58*(4), 339 – 343. [\[CrossRef\]](#)
- Bozier, J., Zakarya, R., Chapman, D. G., & Oliver, B. G. G. (2020). How harmless are E-cigarettes? Effects in the pulmonary system. *Current Opinion in Pulmonary Medicine*, *26*(1), 97 – 102. [\[CrossRef\]](#)
- Centner, A. M., Bhide, P. G., & Salazar, G. (2020). Nicotine in senescence and atherosclerosis. *Cells*, *9*(4), 1035. [\[CrossRef\]](#)

## Dursun et al. Respiratory Symptom Experience Scale in Turkish

- El-Boraie, A., & Tyndale, R. F. (2021). The role of pharmacogenetics in smoking. *Clinical Pharmacology and Therapeutics*, *110*(3), 599 – 606. [\[CrossRef\]](#)
- Collaborators, G. B. D. T. (2017). Smoking prevalence and attributable disease burden in 195 countries and territories, 1990 – 2015: A systematic analysis from the Global Burden of Disease Study 2015. *Lancet*, *389*(10082), 1885 – 1906. [\[CrossRef\]](#)
- Hair, J. F., Babin, B. J., Black, W. C., & Anderson, R. E. (2019). *Multivariate data analysis*. Cengage Publishing.
- Hecht, S. S. (2003). Tobacco carcinogens, their biomarkers and tobacco-induced cancer. *Nature Reviews. Cancer*, *3*(10), 733 – 744. [\[CrossRef\]](#)
- Ji, X., Yao, H., Meister, M., Gardenhire, D. S., & Mo, H. (2021). Tocotrienols: Dietary supplements for chronic obstructive pulmonary disease. *Antioxidants*, *10*(6), 883. [\[CrossRef\]](#)
- Jones, P. W., Harding, G., Berry, P., Wiklund, I., Chen, W. H., & Kline Leidy, N. (2009). Development and first validation of the COPD Assessment Test. *European Respiratory Journal*, *34*(3), 648 – 654. [\[CrossRef\]](#)
- Jones, P. W., Quirk, F. H., & Baveystock, C. M. (1991). The St George's respiratory questionnaire. *Respiratory Medicine*, *85*(2 Suppl. B), 25 – 37. [\[CrossRef\]](#)
- Koo, T. K., & Li, M. Y. (2016). A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *Journal of Chiropractic Medicine*, *15*(2), 155 – 163. [\[CrossRef\]](#)
- Labaki, W. W., & Rosenberg, S. R. (2020). Chronic obstructive pulmonary disease. *Annals of Internal Medicine*, *173*(3), ITC17 – ITC32. [\[CrossRef\]](#)
- Lin, L., Li, J., Song, Q., Cheng, W., & Chen, P. (2022). The role of HMGB1/RAGE/TLR4 signaling pathways in cigarette smoke-induced inflammation in chronic obstructive pulmonary disease. *Immunity, Inflammation and Disease*, *10*(11), e711. [\[CrossRef\]](#)
- Liu, Y., Pleasants, R. A., Croft, J. B., Wheaton, A. G., Heidari, K., Malarcher, A. M., Ohar, J. A., Kraft, M., Mannino, D. M., & Strange, C. (2015). Smoking duration, respiratory symptoms, and COPD in adults aged  $\geq 45$  years with a smoking history. *International Journal of Chronic Obstructive Pulmonary Disease*, *10*, 1409 – 1416. [\[CrossRef\]](#)
- Louhelainen, N., Ryttilä, P., Haahntela, T., Kinnula, V. L., & Djukanović, R. (2009). Persistence of oxidant and protease burden in the airways after smoking cessation. *BMC Pulmonary Medicine*, *9*, 25. [\[CrossRef\]](#)
- Münzel, T., Hahad, O., Kuntic, M., Keaney, J. F., Deanfield, J. E., & Dairber, A. (2020). Effects of tobacco cigarettes, e-cigarettes, and water-pipe smoking on endothelial function and clinical outcomes. *European Heart Journal*, *41*(41), 4057 – 4070. [\[CrossRef\]](#)
- Murray, C. J., & Lopez, A. D. (1997). Global mortality, disability, and the contribution of risk factors: Global Burden of Disease Study. *Lancet*, *349*(9063), 1436 – 1442. [\[CrossRef\]](#)
- Özer, N., Kılıçkap, M., Tokgözoğlu, L., Göksülük, H., Karaaslan, D., Kayıkçıoğlu, M., Yılmaz, M. B., Barçın, C., Abacı, A., & Şahin, M. (2018). Data on smoking in Turkey: Systematic review, meta-analysis and meta-regression of epidemiological studies on cardiovascular risk factors. *Türk Kardiyoloji Dernegi Arsivi: Turk Kardiyoloji Derneginin Yayin Organidir*, *46*(7), 602 – 612. [\[CrossRef\]](#)
- Principe, R., Zagà, V., Martucci, P., Di Michele, L., Barbetta, C., Serafini, A., Cattaruzza, M. S., & Giacomozzi, C. (2024). Smoking cessation in the management of chronic obstructive pulmonary disease (COPD): Narrative review and recommendations. *Annali dell'Istituto Superiore di Sanita*, *60*(1), 14 – 28. [\[CrossRef\]](#)
- Pyszora, A., & Lewko, A. (2022). Non-pharmacological management in palliative care for patients with advanced COPD. *Frontiers in Cardiovascular Medicine*, *9*, 907664. [\[CrossRef\]](#)
- Ruvuna, L., & Sood, A. (2020). Epidemiology of chronic obstructive pulmonary disease. *Clinics in Chest Medicine*, *41*(3), 315 – 327. [\[CrossRef\]](#)
- Sharma, A., Kaur, S., Sarkar, M., Sarin, B. C., & Changotra, H. (2021). The AGE-RAGE axis and RAGE genetics in chronic obstructive pulmonary disease. *Clinical Reviews in Allergy and Immunology*, *60*(2), 244 – 258. [\[CrossRef\]](#)
- Shields, S. A., Mallory, M. E., & Simon, A. (1989). The Body Awareness Questionnaire: Reliability and validity. *Journal of Personality Assessment*, *53*(4), 802 – 815. [\[CrossRef\]](#)
- Shiffman, S., McCaffrey, S. A., Hannon, M. J., Goldenson, N. I., & Black, R. A. (2023). A new questionnaire to assess respiratory symptoms (the respiratory symptom experience scale): Quantitative psychometric assessment and validation Study. *JMIR Formative Research*, *7*, e44036. [\[CrossRef\]](#)
- Terwee, C. B., Bot, S. D., de Boer, M. R., van der Windt, D. A., Knol, D. L., Dekker, J., Bouter, L. M., & de Vet, H. C. (2007). Quality criteria were proposed for measurement properties of health status questionnaires. *Journal of Clinical Epidemiology*, *60*(1), 34 – 42. [\[CrossRef\]](#)
- van der Molen, T., Willemse, B. W., Schokker, S., ten Hacken, N. H., Postma, D. S., & Juniper, E. F. (2003). Development, validity and responsiveness of the Clinical COPD Questionnaire. *Health and Quality of Life Outcomes*, *1*(1), 13. [\[CrossRef\]](#)
- Vogelmeier, C. F., Criner, G. J., Martinez, F. J., Anzueto, A., Barnes, P. J., Bourbeau, J., Celli, B. R., Chen, R., Decramer, M., Fabbri, L. M., Frith, P., Halpin, D. M., López Varela, M. V., Nishimura, M., Roche, N., Rodriguez-Roisin, R., Sin, D. D., Singh, D., Stockley, R., Vestbo, J., et al. (2017). Global strategy for the diagnosis, management, and prevention of chronic obstructive lung disease 2017 report. GOLD executive summary. *American Journal of Respiratory and Critical Care Medicine*, *195*(5), 557 – 582. [\[CrossRef\]](#)
- Yayan, J., Franke, K. J., Biancosino, C., & Rasche, K. (2024). Comparative systematic review on the safety of e-cigarettes and conventional cigarettes. *Food and Chemical Toxicology*, *185*, 114507. [\[CrossRef\]](#)

## Appendices

The Turkish version of the four-item Respiratory Symptom Experience Scale is given in the table below.

### Solunum Semptom Deneyim Ölçeği Türkçe Versiyonu

Aşağıdaki sorular için lütfen son 30 gün içindeki deneyimlerinizi düşünün.	Hiçbir zaman (Son 30 gün içinde 0 gün)	Nadiren (1 – 5 gün)	Bazen (6 – 15 gün)	Çoğu günler (16 – 29 gün)	Her gün (Son 30 gün içindeki her gün)
1 SABAH ÖKSÜRÜĞÜ Sabah öksürüğüne eşlik eden balgam veya mukus					
2 SIK SIK ÖKSÜRME Gün içerisinde sık sık öksürme					
3 ÇABUCAK NEFESSİZ KALMA Normal günlük aktiviteler sırasında (örneğin çamaşır sepetini makineye taşıırken ve alışveriş yaparken) çabucak nefessiz kalma					
4 HIRILTILI SOLUNUM Egzersiz veya fiziksel olarak yorucu diğer günlük aktiviteleri yapmadığınız zamanlarda (örneğin dinlenirken) göğsünüzden hırıltı veya ıslık sesinin gelmesi					

Hiçbir zaman (son 30 gün içinde 0 gün), nadiren (1 – 5 gün), bazen (6 – 15 gün), çoğu günler (16 – 29 gün), her gün (son 30 gün içindeki her gün)