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ORIGINAL ARTICLE

Turkish translation and validation of the Xerostomia Inventory

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ABSTRACT

Objectives: The Xerostomia Inventory (XI) was developed to assess the severity of dryness in patients with xerostomia. It has a long and a short form with three- and five-point Guttman-type response options. In this study, we aimed to translate the XI into Turkish, to assess the validity and reliability of both response options in patients with head & neck cancer (HNC) or Sjögren syndrome (SS), and to select the optimal version for Turkish patients.

Patients and methods: Between January 2019 and June 2019, the XI was translated into Turkish (XI-T) and applied to patients aged ≥18 years with HNC and SS. All patients were applied two tests including both the three- and five-point options. The internal consistency was assessed by Cronbach alpha and test-retest reliability by intraclass correlation coefficients (ICCs). Content validity was based on expert opinion and patient reviews.

Results: A total of 186 patients (109 males, 77 females; median age: 54 years; range, 19 to 78 years) answered the XI-T. The number of patients with HNC and SS was 143 (77%) and 43 (23%), respectively. Median XI-T score was 17 for the three-point, and 24 for the five-point option, respectively. Overall internal consistency was satisfactory for both options (α=0.81 and α=0.89, respectively). Overall test-retest reliability was satisfactory and ICCs ranged between 0.71 and 0.92 for the three-point, and 0.36 and 0.94 for the five-point option, respectively. Assessments based on expert opinions and patient reviews also favored the content validity of the scale.

Conclusion: The XI-T with both three- and five-point options is a valid and reliable tool to evaluate the presence and severity of dryness in patients with HNC and SS who experience xerostomia. The three-point option is more comprehensible and can be preferred over the five-point option in the Turkish population.

Keywords: Head and neck cancer, Sjögren syndrome, validity, xerostomia.

Xerostomia is defined as the dryness in the mouth as a result of decreased production of saliva.[1] It can develop due to endocrine, autoimmune, infectious and granulomatous diseases.[2,3] One of these autoimmune diseases is Sjögren syndrome (SS) which primarily affects the exocrine glands and leads to dryness of the oral and ocular mucosae.[4] Xerostomia can also be a result of medications and other treatments, such as radiotherapy (RT).[2,5-8] Radiotherapy to the head and neck (H&N) can lead to glandular atrophy and fibrosis by destructing the acinar and stem cells of the salivary glands.[9]

Diagnosis of xerostomia is important, as it can cause difficulty in swallowing, chewing, and speaking as well as halitosis, altered taste, glossitis, cracked lips, oral candidiasis and dental caries leading to a poor quality of life (QoL).[2,10,11] However, the diagnosis of xerostomia is difficult, as it is a subjective symptom.[12] Certain tests by

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measuring the saliva output and rate can express salivary gland hypofunction.[13,14] Yet, the relation between the salivary flow rate and subjective dryness is sparse.[15] A significant number of patients with complaints of xerostomia do not have hyposalivation which is an objective measure of saliva flow.[16,17] To discriminate from hyposalivation, questionnaires have been developed to assess the presence and also the severity of xerostomia which is composed of a series of symptoms.[14,18] One of these questionnaires is the Xerostomia Inventory (XI) which was developed by Murray Thomson, an Australian dentist, in 1999 to assess the dryness of the mouth, as well as the eyes, nose, and skin.[12]

The XI has mostly been used in elderly patients and patients under certain medications, as well as patients with SS or patients with a plan of RT to the H&N. Until recently, the XI has been translated into Portuguese, Greek, Spanish, Korean and German.[19-23] In 2011, van der Putten et al.[24] shortened the 11-item version to a five-item questionnaire with three-point options as answers (summated XI-SXI). This version also exists in Chinese, Portuguese, German and Indonesian, as well as the original Dutch.[23,25-27]

There has not been a Turkish translation until recently. In the present study, we, for the first time, aimed to translate the XI into Turkish and to assess the validity and reliability of both the three- and five-point options in patients with H&N cancer (HNC) who underwent RT and patients with SS with an attempt to select the optimal version for Turkish patients that can be more comprehensible and more easily answered.

PATIENTS AND METHODS

This prospective study was conducted at Hacettepe University Faculty of Medicine, Departments of Radiation Oncology and Rheumatology between January 2019 and June 2019. In the first phase, the XI was translated into Turkish. Before the translation, official approval was obtained from Murray Thomson by electronic mail. For the translation process, two clinicians translated the original English items into Turkish. The most appropriate translation was decided by a senior clinician. Two other clinicians, then, re-translated these items into English again. Subsequently, the senior clinician approved the final translation. After the translation process was finished, we applied the questionnaire to 10 patients who underwent H&N RT. We took their feedback on whether the items were difficult to understand, confusing, or upsetting. All patients agreed with the final translations and no items were changed. The senior author also approved the content validity and face validity, which was called the translated form XI-Turkish (XI-T).

In the second phase, we applied the XI-T to more patients who received RT to the H&N region in the Radiation Oncology department and also to patients with a diagnosis of SS followed in the rheumatology department. This questionnaire was mentioned as the 'first questionnaire' in the manuscript. All patients were aged >18 years. The XI-T was applied again to the same patients after two weeks for the test-retest analysis. This questionnaire for the re-test analysis was mentioned as the 'second questionnaire' in the manuscript.

The XI-T is used to assess the severity of dryness during daily living activities. It includes 11 items which measure the dryness in the mouth, eyes, nose, and skin, and a standard question: 'How often does your mouth feel dry?'. For the standard question, the answers consist of 1: Never, 2: Occasionally, 3: Frequently, and 4: Always. For the other items, the response formats included a three- and a five-point Guttman-type response options. The three-point option consists of the answers 1: Never, 2: Sometimes, and 3: Often; and the 5-point option included 1: Never, 2: Almost never, 3: Sometimes, 4: Fairly often, and 5: Very often. We asked the patients to answer both options. The total score of the 11 items and the standard question were recorded and used to assess the severity of xerostomia. A higher score implies a more severe xerostomia.

Statistical analysis

Statistical analysis was performed using the IBM SPSS version 25.0 software (IBM Corp., Armonk, NY, USA). Descriptive data were presented in mean ± standard deviation (SD) for continuous variables and in number and frequency for categorical variables. Comparisons between independent groups were performed using the Mann-Whitney U test for two groups and the Kruskal-Wallis test for multiple groups.

Internal consistency of scales was analyzed using Cronbach alpha, and test-retest reliability using Spearman correlation analysis by intraclass correlation coefficients (ICCs). A Cronbach alpha of >0.7 and >0.8 indicates acceptable and good reliability, respectively.[28] The ICC values of 0.6 to 0.8 indicate good reliability, while a value of >0.8 is considered optimal.[29] Construct validity was evaluated by correlation matrices between subdomains of the scale. Discriminant properties were analyzed by comparison of scores between sexes, age groups (<35 years *vs.* 35-60 years *vs.* >60 years), and diagnosis (oral cavity cancer [OCC] + oropharyngeal cancer [OPC] *vs.* laryngeal cancer [LC] + hypopharyngeal cancer [HPC] *vs.* nasopharyngeal cancer [NPC] *vs.* SS). Content validity was based on expert opinion and patient reviews. Error bars were used to visualize the data. A *p* value of <0.05 was considered statistically significant.

RESULTS

After the translation process, a total of 186 patients (109 males, 77 females; median age: 54 years; range, 19 to 78 years) were applied the XI-T. All patients completed the first questionnaires of both the three-point and five-point options. However, the attrition rate for the second questionnaire of both scales were 15% and 20%, respectively. The number of patients with HNC and SS was 148 (80%) and 38 (20%), respectively. Among patients with HNC, 67 (45%) had NPC, 66 (45%) LC and HPC, and 15 (10%) had OPC and OCC, respectively.

The median XI-T score was 17 (range, 11 to 35) for the three-point option and 24 (range, 12 to 56) for the five-point option, respectively. For both options, median scores were significantly higher in women versus men (Figure 1a and b), in patients >35 years of age

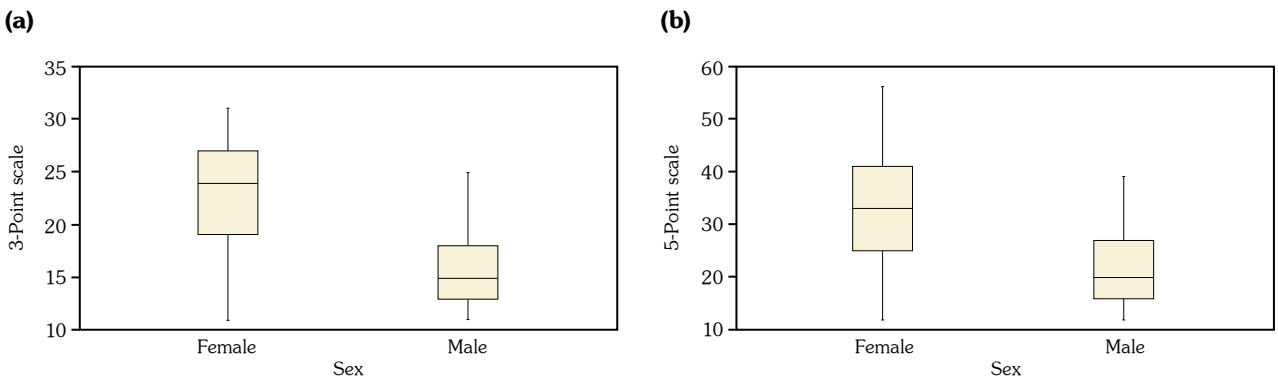

Figure 1. Median XI-T scores for the three-point option **(a)** and for the five-point option **(b)** comparing women and men.

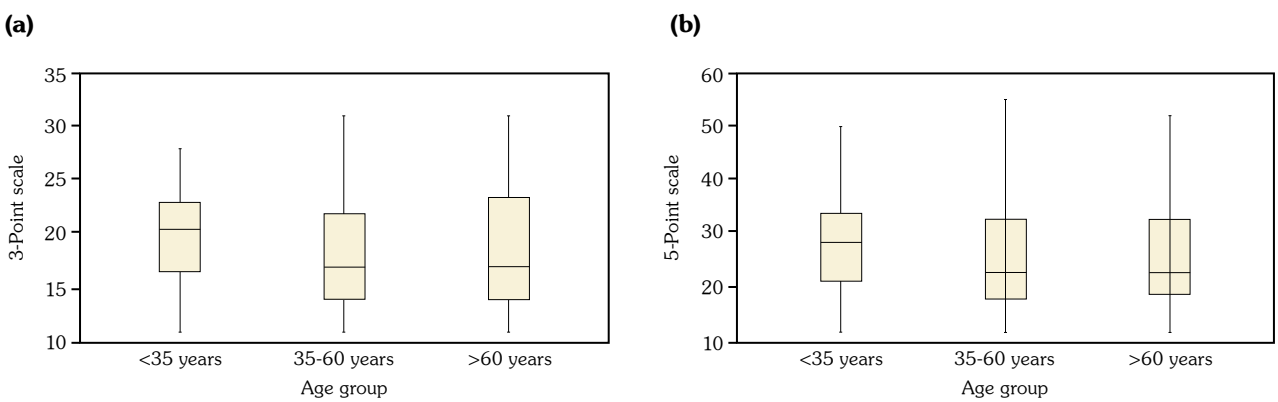

Figure 2. Median XI-T scores for the three-point option **(a)** and for the five-point option **(b)** comparing <35 years and ≥35 years.

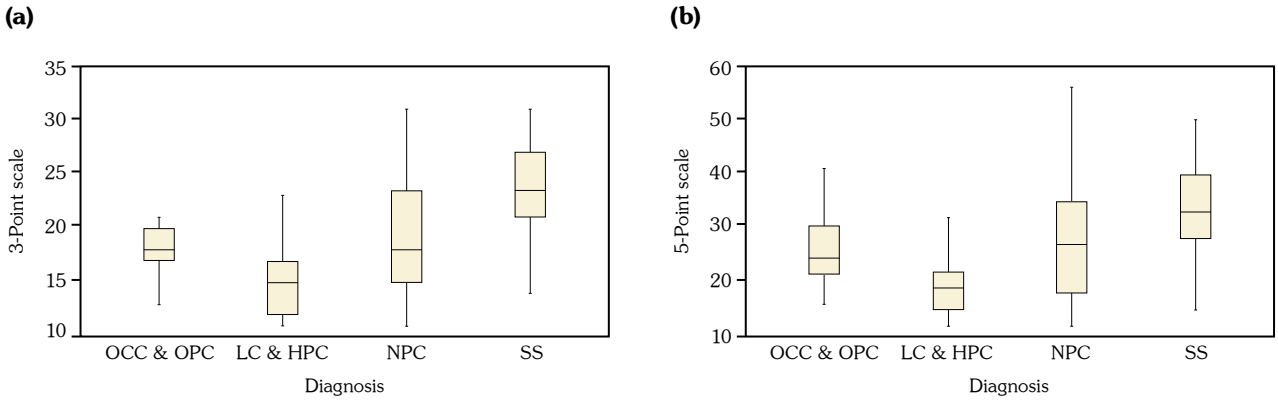

Figure 3. Median XI-T scores for the three-point option **(a)** and for the five-point option **(b)** comparing disease types.
OCC: Oral cavity cancer; OPC: Oropharyngeal cancer; LC: Laryngeal cancer; HPC: Hypopharyngeal cancer; NPC: Nasopharyngeal cancer; SS: Sjögren syndrome.

versus patients <35 years (Figure 2a and b), in patients with SS versus patients with cancer, and in patients with NPC versus patients with LC/HPC and OPC/OCC (Figure 3a and b). The scores can be seen in Table 1.

For both the three- and five-point options, all items were consistent in the test and re-test analysis. Overall internal consistency was satisfactory for both options (α=0.81 and α=0.89, respectively). Overall test-retest reliability was satisfactory, and ICCs ranged between 0.71 and 0.92 for the three-point, and 0.36 and 0.94 for the five-point option, respectively. The lowest ICC for the five-point option arose from one item only (my mouth feels dry while eating a meal), and the second lowest ICC was 0.74. The ICC for this specific item was 0.71 for the three-point option. The ICCs for the three-point and five-point options can be seen in Tables 2 and 3, respectively. Assessments based on expert opinions and patient reviews also favored the content validity of the scale.

DISCUSSION

The XI-T was found to be a valid and reliable tool to evaluate xerostomia in patients with

Table 1. Sex, age, and disease-specific results of three- and five-point scales

	3-point scale			5-point scale		
Characteristic	Median	IQR	*p*	Median	IQR	*p*
Age			<0.001**			<0.001**
<35 years	20.5	16.5-23		28.5	21.5-34	
35-60 years	17	14-22		23	18-33	
>60 years	17	14-24		23	19-33	
Sex			<0.001*			<0.001*
Female	22	19-27		33	25-41	
Male	15	13-18		20	16-27	
Disease			<0.001**			<0.001**
OPC/OCC	18	17-20		24.5	21.5-30.5	
LC/HPC	15	12-17		19	15-22	
NPC	18	15-23.5		27	18-35	
SS	23.5	21-27		33	28-40	

IQR: Interquartile range; OPC: Oropharyngeal cancer; OCC: Oral cavity cancer; LC: Laryngeal cancer; HPC: Hypopharyngeal cancer; NPC: Nasopharyngeal cancer; SS: Sjögren syndrome; * Mann-Whitney U test; ** Kruskal-Wallis test.

Table 2. ICCs (r) and p values (p) for the three-point scale

			2nd test											
Questions			Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12*
1st test	Q1	r	0.736	0.306	0.410	0.594	0.466	0.329	0.312	0.460	0.532	0,564	0,442	0.779
		p	<0.001	0.006	<0.001	<0.001	<0.001	0.003	0.005	<0.001	<0.001	<0.001	<0.001	<0.001
	Q2	r	0.288	0.830	0.288	0.584	0.676	0.275	0.641	0.243	0.333	0.285	0.381	0.369
		p	0.010	<0.001	0.010	<0.001	<0.001	0.015	<0.001	0.031	0.003	0.011	<0.001	0.001
	Q3	r	0.267	0.183	0.792	0.396	0.352	0.153	0.163	0.121	0.102	0.216	0.175	0.232
		p	0.016	0.105	<0.001	<0.001	0,001	0.179	0.146	0.284	0.366	0.055	0.117	0.037
	Q4	r	0.429	0.419	0.374	0.710	0.564	0.227	0.325	0.332	0.444	0.468	0.465	0.554
		p	<0.001	<0.001	0.001	<0.001	<0.001	0.045	0.003	0.003	<0.001	<0.001	<0.001	<0.001
	Q5	r	0.279	0.525	0.325	0.538	0.805	0.236	0.545	0.178	0.187	0.199	0.235	0.274
		p	0.012	<0.001	0.003	<0.001	<0.001	0.036	<0.001	0.115	0.096	0.077	0.035	0.013
	Q6	r	0.142	0.085	0.011	0.225	0.196	0.793	0.050	0.217	0.220	0.168	0.161	0.378
		p	0.207	0.454	0.924	0.045	0.084	<0.001	0.659	0.053	0.050	0.137	0.151	<0.001
	Q7	r	0.258	0.719	0.169	0.521	0.625	0.101	0.780	0.237	0.211	0.239	0.267	0.315
		p	0.020	<0.001	0.132	<0.001	<0.001	0.375	<0.001	0.035	0.061	0.033	0.016	0.004
	Q8	r	0.465	0.237	0.062	0.345	0.205	0.255	0.171	0.918	0.701	0.609	0.515	0.569
		p	<0.001	0.034	0.579	0.002	0.070	0.023	0.126	<0.001	<0.001	<0.001	<0.001	<0.001
	Q9	r	0.422	0.261	0.131	0.442	0.248	0.389	0.194	0.664	0.903	0.644	0.519	0.540
		p	<0.001	0.020	0.242	<0.001	0.028	<0.001	0.083	<0.001	<0.001	<0.001	<0.001	<0.001
	Q10	r	0.547	0.294	0.232	0.562	0.364	0.355	0.239	0.681	0.688	0.869	0.547	0.663
		p	<0.001	0.008	0.037	<0.001	0.001	0.001	0.032	<0.001	<0.001	<0.001	<0.001	<0.001
	Q11	r	0.378	0.315	0.198	0.534	0.317	0.369	0.251	0.597	0.624	0.569	0.898	0.556
		p	0,001	0.004	0.077	<0.001	0.004	0.001	0.024	<0.001	<0.001	<0.001	<0.001	<0.001
	Q12*	r	0.708	0.319	0.349	0.569	0.498	0.350	0.227	0.502	0.573	0.614	0.499	0.810
			<0.001	0.004	0.001	<0.001	<0.001	0.002	0.042	<0.001	<0.001	<0.001	<0.001	<0.001

ICC: Intraclass correlation coefficient; Q: Question number; * Standard question; r: Spearman rho, non-parametric correlation coefficient.

HNC and SS. This conclusion is valid for both the three- and five-point options. However, based on one item solely, the three-point option seems to be more easily understood by the Turkish population. Most previous validation trials excluded patients with SS and HNC, but preferred including patients with xerostomia related to other reasons. We specifically included patients with SS and HNC undergoing RT based on the fact that these conditions are related up to 80% rates of xerostomia.[30,31]

The XI was developed by Thomson et al.[12] in 1999 in elderly patients applied for dental services in South Australia. The main goal was to measure not only the severity of dry mouth, but also the difficulty in swallowing and speaking. The authors started off with 19 items and a five-point option including 'never', 'hardly ever', 'occasionally', 'frequently' and 'always'. To assess xerostomia as objectively as possible, they also examined the salivary flow rate at the same time with the questionnaire. Using several items, the authors developed the XI and the Burning Mouth Syndrome (BMS) questionnaires simultaneously. The Cronbach alpha was 0.84 for the XI and 0.80 for the BMS, respectively, and these two scales were found correlated with each other. The scores were significantly higher in females compared to

Table 3. Intraclass correlation coefficients (r) and p values (p) for the five-point scale

			2nd test											
Questions			Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12*
1st test	Q1	r	0.740	0.235	0.288	0.306	0.350	0.353	0.185	0.469	0.550	0.576	0.473	0.779
		p	<0.001	0.036	0.009	0.006	0.001	0.001	0.098	<0.001	<0.001	<0.001	<0.001	<0.001
	Q2	r	0.264	0.854	0.223	0.086	0.562	0.168	0.724	0.080	0.228	0.205	0.261	0.348
		p	0.017	<0.001	0.044	0.446	<0.001	0.134	<0.001	0.477	0.041	0.064	0.018	0.001
	Q3	r	0.209	0.249	0.825	0.018	0.282	0.076	0.118	0.175	0.102	0.276	0.250	0.293
		p	0.058	0.025	<0.001	0.874	0.011	0.500	0.293	0.117	0.363	0.012	0.023	0.007
	Q4	r	0.366	0.402	0.254	0.360	0.503	0.309	0.348	0.409	0.470	0.478	0.521	0.443
		p	0.001	<0.001	0.020	0.001	<0.001	0.005	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Q5	r	0.349	0.628	0.363	0.257	0.828	0.193	0.624	0.135	0.196	0.166	0.323	0.287
		p	0.001	<0.001	0.001	0.020	<0.001	0.084	<0.001	0.229	0.080	0.136	0.003	0.009
	Q6	r	0.177	0.094	0.014	0.139	0.143	0.846	0.080	0.161	0.268	0.263	0.153	0.265
		p	0.109	0.405	0.902	0.213	0.202	<0.001	0.474	0.149	0.015	0.016	0.168	0.015
	Q7	r	0.281	0.841	0.245	0.251	0.669	0.098	0.904	0.139	0.134	0.139	0.205	0.336
		p	0.010	<0.001	0.026	0.023	<0.001	0.381	<0.001	0.212	0.231	0.211	0.062	0.002
	Q8	r	0.435	0.209	0.138	0.108	0.178	0.196	0.229	0.877	0.671	0.630	0.545	0.543
		p	<0.001	0.061	0.215	0.333	0.113	0.078	0.039	<0.001	<0.001	<0.001	<0.001	<0.001
	Q9	r	0.559	0.132	0.140	0.259	0.229	0.351	0.118	0.687	0.910	0.686	0.520	0.638
		p	<0.001	0.239	0.206	0.019	0.040	0.001	0.290	<0.001	<0.001	<0.001	<0.001	<0.001
	Q10	r	0.537	0.204	0.232	0.133	0.227	0.352	0.139	0.751	0.766	0.936	0.576	0.709
		p	<0.001	0.068	0.035	0.234	0.042	0.001	0.213	<0.001	<0.001	<0.001	<0.001	<0.001
	Q11	r	0.432	0.211	0.203	0.368	0.254	0.279	0.192	0.608	0.661	0.600	0.889	0.604
		p	<0.001	0.059	0.065	0.001	0.022	0.011	0.084	<0.001	<0.001	<0.001	<0.001	<0.001
	Q12*	r	0.731	0.273	0.262	0.329	0.403	0.307	0.191	0.564	0.661	0.660	0.598	0.825
			<0.001	0.014	0.017	0.003	<0.001	0.005	0.086	<0.001	<0.001	<0.001	<0.001	<0.001

Q: Question number; * Standard question; r: Spearman rho, non-parametric correlation coefficient.

males for XI, which is also the case in our study and some others in the literature.[32-35] Importantly, only the item 'My mouth feels dry' was found to be significantly correlated with the salivary flow rate. The authors concluded that the items in the XI were related to both the individual's awareness of xerostomia and consequences of xerostomia symptoms, making XI a valid tool for measuring xerostomia. After excluding items specific to BMS, the XI was developed as an 11-item scale including five-point options of 'never', 'hardly ever', 'occasionally', 'fairly often' and 'very often'. The authors also developed a standard question (How often does your mouth feel dry?) with four-point options of 'never', 'occasionally', 'frequently', and 'always'. As the answer to this question was found to be correlated with the total XI score, it was recommended to be used along with the 11 items to justify their validity. Later in 2000, the XI was tested by the same group in patients with HNC in whom RT was indicated and these patients were compared to an asymptomatic group.[36] The attrition rate was 27.8%, and the concurrent validity and temporal stability of XI were acceptable. In 2007, Thomson[37] made a secondary analysis on these patients and found the Cronbach alpha 0.85 and 0.90 for test and re-test, respectively, and the ICC for test-retest

reliability 0.92 ($p<0.001$). The results of this study suggested that a change in XI score of ≥6 points was clinically meaningful, and the validity and responsiveness of XI were acceptable.

The XI has been translated in several languages and validated in various populations since then. The Portuguese (XI-PL), Spanish, and Korean versions were validated in patients with SS which also measured the salivary flow rate.[19,21,22] The mean scores ranged between 40.2 and 43.6, the Cronbach alphas between 0.868 and 0.90, and the ICCs between 0.48 and 0.94, respectively. The Dutch translation was validated in physically impaired nursing home residents with an average age of 78 years.[24] However, patients with SS and patients with a history of RT for HNC were specifically excluded. During the validation process, the authors noticed the difficulty of discrimination between the five response options. Therefore, the number was decreased to three as 'never', 'occasionally', and 'ever', and the authors named this modified version 'Summated XI-Dutch version' (SXI-D). In this study, the mean SXI score was 16.5±4.2, and the Pearson correlation coefficient was above 0.6 for items 2, 4, 5, 7, and 10. The scores were not significantly different between sexes or age groups. The authors concluded that both XI-D and SXI-D had restricted diagnostic suitability and, thus, recommended that a modified version excluding items not directly related to dry mouth might be a suitable inventory for the severity of xerostomia. Thomson et al.,[38] then, measured the validity of SXI-D in samples in the previous studies adding new individuals from Japan after translating it into Japanese and pilot testing. The samples comprised elder individuals and also included patients with a RT plan for HNC. The mean scale scores were between 7.6 and 9.8, and the internal reliability of each item was acceptable with the Cronbach alpha ≥0.70. The Pearson correlations between the three- and five-point options were >0.92 for all items, and the Spearman correlation coefficients for these did not differ by >0.03 for the standard question, either. The authors concluded that the SXI was valid and acceptable for self-reported oral dryness, and a deterioration by four-scale points can be considered clinically meaningful. They recommended the standard question be used to provide a validity check while using either XI or SXI.

Since then, the SXI has been validated in several languages.[23,25,26,35] The Portuguese version patients with SS with a mean score of 11.2±2.9 and 11.6±3.0, and Cronbach α 0.84 and 0.87 for the test and re-test, respectively.[26] The ICC for the test-retest reliability was 0.93, and individual scores ranged between 0.79 and 0.90. The total score was strongly correlated with the standard question in this study (r=0.66). The German version of XI and SXI were validated in patients with radiation-induced xerostomia after radioligand therapy for metastatic prostate cancer or RT for thyroid cancer but also included patients without xerostomia.[23] The mean score was 44.2±5.0 and 12.3±1.4 for the XI, and 10.2±4.5 and 1.5±0.5 for the SXI in patients with and without xerostomia, respectively. The Cronbach alpha was 0.92 for the XI and 0.91 for the SXI, respectively. The authors also used the items on swallowing, sticky saliva and dry mouth in the European Organization for the Treatment of Cancer (EORTC) Quality of Life-Head and Neck (QLQ-H&N)35 questionnaire. While the XI was correlated with all three subcategories, the SXI was only correlated with dry mouth. Besides, the XI and SXI were found to be strongly correlated with each other (r=0.75). The authors concluded that both the XI and SXI versions could be used patients with xerostomia.

Our study has some limitations. Not all patients answered the re-test, yet the attrition rate was adequate to assess the test re-test reliability. We did not measure the salivary flow, but it is not an absolute must, when the standard question is applied. However, our study is the first to use the 11-item XI with three-point options. This version was proved valid and reliable in Turkish patients of both genders and all age groups with SS and HNC undergoing RT. The number of patients in the current study is one of the highest reported in the literature. Besides, this is the only study on XI showing that xerostomia is more severe in elder individuals which has been reported in the literature.[39] Although there are no data comparing the severity of xerostomia in patients with SS and patients with HNC undergoing RT, our study revealed a significantly higher rate of xerostomia in patients with SS, as could be expected.

In conclusion, the XI-T scale with both three- and five-point options is a valid and reliable tool to evaluate the presence and severity of dryness in

Turkish patients with HNC and SS who experience xerostomia. As the severity of dry mouth cannot be profoundly graded by the five-point option, we recommend using the three-point option for an easier differentiation.

Ethics Committee Approval: The study protocol was approved by the Hacettepe University Faculty of Medicine Ethics Committee for Non-Invasive Clinical Research (date, no: 15 Jan 2019, no: 2019/06-13). The study was conducted in accordance with the principles of the Declaration of Helsinki.

Patient Consent for Publication: A written informed consent was obtained from each participant.

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

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Appendix 1. XI-T with five-point options

Asla:	1
Ara sıra:	2
Sıkça:	3

Ağzımı kuru hissediyorum.

Kuru gıdaları yerken zorlanıyorum.

Geceleri su içmek için uyanıyorum.

Yemek yerken ağzımı kuru hissediyorum.

Yiyecekleri yutarken, yutmaya yardımcı olmak için sıvı tüketiyorum.

Ağız kuruluğunu rahatlatmak için şekerleme emiyorum veya sakız çiğniyorum.

Bazı yiyecekleri yutarken zorlanıyorum.

Yüzümün cildini kuru hissediyorum.

Gözlerimi kuru hissediyorum.

Dudaklarımı kuru hissediyorum.

Burnumun içini kuru hissediyorum.

Ne sıklıkla ağzınız kuruyor.

Appendix 2. XI-T with three-point options

Asla:	1
Çok nadir:	2
Ara sıra:	2
Oldukça sık:	4
Çok sık:	5

Ağzımı kuru hissediyorum.

Kuru gıdaları yerken zorlanıyorum.

Geceleri su içmek için uyanıyorum.

Yemek yerken ağzımı kuru hissediyorum.

Yiyecekleri yutarken, yutmaya yardımcı olmak için sıvı tüketiyorum.

Ağız kuruluğunu rahatlatmak için şekerleme emiyorum veya sakız çiğniyorum.

Bazı yiyecekleri yutarken zorlanıyorum.

Yüzümün cildini kuru hissediyorum.

Gözlerimi kuru hissediyorum.

Dudaklarımı kuru hissediyorum.

Burnumun içini kuru hissediyorum.

Ne sıklıkla ağzınız kuruyor.