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Original Research Articles

Validity and Reliability of the Turkish Self-Administered Leeds Assessment of Neuropathic Symptoms and Signs (S-LANSS) Questionnaire

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Abstract

Objective. The Self-Administered Leeds Assessment of Neuropathic Symptoms and Signs (S-LANSS) is a 7-item self-report scale developed to identify pain of predominantly neuropathic origin. The aim of this study was to develop a Turkish version of the S-LANSS and to test its validity and reliability in chronic pain patients.

Method and Patients. We enrolled 244 chronic pain patients treated at the Neurology Department. The original version of the S-LANSS was translated into Turkish by standard procedures. An independent clinician determined the pain type (neuropathic vs nociceptive). The reliability (internal consistency and test-retest reliability) and validity (agreement with the reference diagnosis and sensitivity, specificity, and positive and negative predictive values) were determined.

Results. Two-hundred and forty-four patients with chronic pain (167 women, 43.1 ± 11.4 years), 137, neuropathic pain and 107, nociceptive pain, were asked to complete the S-LANSS twice. Cronbach's α-coefficient was 0.74 for the test and 0.73 for the retest. Total S-LANSS scores for subjects did not significantly differ between applications ($P = 0.46$). Correlation coefficient was r: 0.97 ($P < 0.01$), which is fairly high for a self-assessment tool. Compared with the clinical assessment, the sensitivity and specificity of the S-LANSS were 72.3% (95% CI, 64.0–79.6%) and 80.4% (95% CI, 71.6–87.4%), respectively, for both the test and retest. The sensitivity and specificity of the Turkish S-LANSS were similar to those determined in the original validation study.

Conclusion. This study reports the first validation of a translated version of the S-LANNS into another language. The results suggest that the Turkish version of S-LANSS is a reliable and valid differential diagnostic measure of neuropathic pain in chronic pain patients.

Key Words. S-LANSS; Pain; Neuropathic; Nociceptive; Reliability; Validation

Introduction

Chronic pain is a common symptom of neurologic disease, and is a persistent, life-altering condition that greatly impacts the quality of life. Chronic pain is distinct from acute pain and is a difficult clinical problem to treat. The correct diagnosis can be a clinical challenge. It is usually classified based on its etiology and pathophysiology as either neuropathic or nociceptive pain [1,2]. As the treatment depends on the type of pain, the clinician must determine the relative contribution of each pathophysiological mechanism to the pain condition and the most suitable treatment strategies to address the relevant mechanisms [3–5].

Pain is a subjective experience and pain measurements must rely on the patients' self report. The methods traditionally used to assess pain (e.g., visual analogue scales, numeric rate scales or verbal rating scales) give reliable results for pain intensity and pain quality [6–11]. Tools to assess chronic pain may include multidimensional scales

and are used in the process of patient evaluation, but provide little information about the etiology of pain [12–16]. A variety of assessment tools for measuring, estimating or describing aspects of a patient's functional ability are reported in the medical literature [12–16], but only a few of these tools are designed for diagnostic purposes [17–19].

Common diagnostic tools are the Leeds Assessment of Neuropathic Symptoms and Signs pain scale (LANSS), the Neuropathic Pain Questionnaire and the neuropathic pain diagnostic questionnaire [17–19]. The LANSS pain scale was developed to identify patients with chronic pain whose pain is predominated by neuropathic mechanisms [18]. It has been validated in a number of settings [20,21]. The usefulness of the LANSS is limited, however, by the need for clinical examination by a physician, and although the examination involves only a pinprick or syringe and cotton, it can be time-consuming and is thus unsuitable for large-scale studies [22,23]. The S-LANSS is derived from the LANSS, for which the validity and reliability as a diagnostic tool for neuropathic pain are established [23]. The S-LANSS is a self-administered test comprising a total of five items regarding pain symptoms, and subjects are instructed to perform self-examinations to determine the presence of allodynia and altered sensation [23]. The S-LANSS was developed by Bennett and has been used in two community-based studies [23–26].

Here, we report the development of a Turkish version of the S-LANSS, as well as tests of its reliability, validity, and utility for estimating the status of chronic pain self-diagnosis.

Materials and Methods

The Questionnaire

The S-LANSS comprises a 5-item questionnaire regarding pain symptoms and two items for clinical signs involving self-administered sensory tests for the presence of allodynia and decreased sensation to pinprick. Responses to each item are binary (yes or no) and each item is weighted differently depending on the odds ratio of a positive response to each item to predict that the pain is primarily neuropathic. The possible scores range from 0 to 24, with a score of 12 or greater considered to be suggestive of neuropathic pain [23].

Translation of the Questionnaire

Permission to translate the S-LANSS into Turkish and to use the Turkish version was granted by the developer, Michael Bennett. Adaptation of the S-LANSS questionnaire into Turkish and subsequent assessment of its reliability and validity were performed following the traditional recommendations for adapting and testing the validity of health questionnaires and diagnostic tests. Two native-Turkish speakers fluent in English initially translated the English-language items into Turkish. Their goal was to preserve the original meaning while using the Turkish language as simply as possible. Bilingually fluent experts evaluated and approved these item translations with a clinician's approval. The items were then back-translated into English by bilingual translators who had not seen the original English version. The English back-translations and the originals were compared. After the second retranslation, almost complete agreement was reached. The final version was established in consultation with the translators. The resulting questionnaire was pilot-tested among 30 chronic pain patients who were subsequently interviewed regarding the instrument's clarity and ease of use. Based on the results of the pilot test, the translation was further refined and the tool was finalized.

Patients

After approval of the study by the institutional ethical committee, 244 patients who had presented to the pain Clinic of Kirikkale University Faculty of Medicine during March 2006 through June 2008 were enrolled in this randomized study. Patients referred to the service and seen in pain clinics, day care wards or inpatient wards were invited to take part in the study during a 16-month period who were eligible for participation in the study. All participants provided informed consent. Randomly selected patients who met the eligibility criteria were asked to participate in the study. Patients with chronic pain for more than 3 months aged 18 years or over, with an adequate cultural level to understand Turkish S-LANSS as self-administered test, were included in this study. Eligibility criteria included men or women, age more than 18 years, Turkish speaking, and having chronic pain at least moderate severity (30 mm on a 0–100 mm visual analog scale [VAS] : 0, no pain, 100, worst possible pain); defined as pain of more than 3 months in duration, which could be attributed to a non-malignant, nervous (peripheral or central), somatic or visceral lesion [27]. Chronic pain could be of a neuropathic or nonneuropathic origin.

Patients with any concomitant illness likely to confound the assessment of pain, or any serious or unstable medical or psychological condition that could compromise participation in the study were excluded. The other exclusion criteria were painful syndromes of unknown origin or associated with diffuse pains (e.g., fibromyalgia), pains presumably of mixed origin (e.g., lumbar or cervical radiculopathies and cancer pains), CRPS type I, headaches, visceral pains, severe depression, chronic alcoholism or substance abuse, or any reason preventing an accurate understanding of the questionnaire. Cancer patients and those patients with pain of a presumably mixed origin were excluded.

Study Setting and Design

The study was carried out at the neurology department. Potentially eligible patients were screened with a standardized format that explained the study and asked screening questions. Then, if patients were eligible, they were asked by the researcher to complete S-LANSS unaided. The researcher then administered the pain clinic questionnaire in interview format, without having seen the

results of self-completion and performed a standardized interview and detailed physical and neurological examination. Then, the patient was then referred to the second investigator, blinded to the results of the first visit, who proceeded similarly. The investigator proposed a diagnosis of neuropathic or non-neuropathic pain on the basis of interview and examination performed according to his/her usual practice and, secondarily, administered the standardized questionnaire as described above. The patients were asked to visit the clinic and perform the S-LANSS questions in the following week at the neurology department for the second test. Each patient was seen in the clinic within an interval of at least 2 days and maximum 7 days. No treatment was initiated between the two visits. After the second visit a treatment was proposed to the patient according to the diagnosis of pain.

Diagnosis of Pain

Patients were diagnosed with neuropathic or nociceptive pain by a pain specialist, based on the medical history, physical examination, electromyography, quantitative sensory tests, laboratory examinations and imaging techniques whenever indicated. In the absence of a formally recognized "gold standard," this was regarded as the "gold standard" against which the ability of the S-LANSS to identify neuropathic pain would be compared. In all cases, a diagnosis of neuropathic pain was made if pain was clearly attributable to a lesion or dysfunction of the nervous system; this was supported by clinical signs with or without evidence from appropriate investigations. The etiologies of chronic pain are shown in Table 1.

Ethical Considerations

Permission to undertake this study was gained from the authors' institutional ethics committee. The study design was approved by the Institutional Review Board of the Kirikkale University Faculty of Medicine and was conducted in compliance with the Helsinki Declaration for research in humans. Informed consent was obtained from all study participants.

Analysis

Descriptive statistics (percentage, mean, median, standard deviation and 95% confidence limits [CL]) are used to present the study sample's demographic and pain-related characteristics, such as the patients' ratings of pain severity. To analyze intergroup variance, Student's *t*-test was used for the quantitative parameters, and chi-square test was used for the qualitative parameters. Mann–Whitney's *U*-test was used in the case of a non-normal distribution to compare continuous or ordinal variables. A *P* value of 0.05 or less was considered to indicate statistical significance. Data were analyzed using SPSS version 9.0 statistical software.

Reliability Measurements

The internal consistency of the multi-item subscales was assessed by Cronbach's alpha coefficient [28]. To demonstrate the reliability of Turkish S-LANSS, internal consistency was evaluated using Cronbach's alpha coefficient. To examine test–retest reliability, the questionnaire was completed twice at the hospital. Test–retest reliability was determined using a paired *t*-test and Pearson's correlation analysis. A value of Cronbach's alpha of 0.70 or greater was considered acceptable for group comparison, as recommended [29]. A Pearson correlation coefficient of 0.40 or above was considered satisfactory. Pearson coefficients were classified as follows: r = 0.81–1.0 as excellent, 0.61–0.80, very good, 0.41–0.60, good, 0.21–0.40 fair and 0–0.20 poor.

Validity

The construct validity was examined by comparison with the gold standard diagnosis. The ability of the Turkish S-LANSS score to discriminate predominantly neuropathic pain was validated against the gold standard diagnosis. Sensitivity, specificity and positive and negative predictive values were determined using cutoff scores of 10 and 12, as suggested in the original validation study for the S-LANSS for the first and second administration, respectively.

Table 1 Etiology of pain in the study participants

Neuropathic Pain	(n)	Nociceptive Pain	(n)
Post-herpetic neuralgia	17	Inflammatory arthropathies	28
Trigeminal neuralgia	25	Osteoarthritis	32
Diabetic polyneuropathy	51	Musculoskeletal Pain	34
Atypical facial pain	6	Peripheral vascular pain	4
Phantom pain	4	Visceral pain	9
Post-stroke pain	14		
Other central pain	15		
Peripheral neuropathy	5		
Total	137	Total	107

Table 2 Demographics and clinical features of neuropathic and nociceptive patients

	Neuropathic Pain (N = 137)	Nociceptive Pain (N = 107)	*P* value
Mean age	43.9 ± 11.8	41.9 ± 10.7	0.15
Range	19–70	19–68	
Sex (female)	69.3% (N: 95)	67.3% (N: 72)	0.73
Pain severity	7.3 ± 2.3	6.8 ± 2.3	0.10
Median	8	7	

Results

The study was performed between June 2007 and May 2008 at the Department of Neurology, Faculty of Medicine at Kirikkale University. We studied 244 chronic pain patients for at least for 3 months.

Demographic and Clinical Characteristics of the Patient Sample

A total of 244 (167 women, 77 men; mean age 43.1 ± 11.4 years, range: 19–70) chronic pain patients participated in the study. The demographic and clinical characteristics of the sample are shown in Table 1. Patients generally rated their pain intensity in visual analog scale as severe, but there were no significant differences in pain intensity between patients with neuropathic pain and those with nociceptive pain as diagnosed by a clinician ($P = 0.1$). Sex ($P = 0.73$), age distribution ($P = 0.15$) and pain intensity ($P = 0.1$) were not statistically different between the two pain groups (Table 2).

Discriminant Validity

Compared with clinical assessment, the sensitivity and specificity of the S-LANSS were 72.3% (95% CI, 64.0–79.6%) and 80.4% (95% CI, 71.6–87.4%), respectively, both in the first application and the second application. The sensitivity and specificity of the S-LANSS compared with assessment by a pain specialist are shown in Table 3. The recommended optimum cutoff points are 12 for the unaided S-LANSS and 10 for the interview format. In the present study, compared with the gold standard (clinical examination and pain specialists diagnosis), the S-LANSS correctly identified the pain type in 73% and 75% of the cases in the first and second application, respectively, when the cutoff score was 12 and over, and between 79% and 80% when the cutoff score was 10 (Table 3).

Construct Validity

Each S-LANSS item was evaluated separately with regard to the total S-LANSS score and the gold standard (clinician diagnosis). Odds ratios for each of the seven components of the S-LANSS to correlate with the clinical assessment were calculated for both the first and second applications (Table 4). The odds ratio (95% CI) for detecting clinically-defined neuropathic pain based on a S-LANSS score of ≥12 was 11.07 (6.02–20.33) in both the first and second application. Each item of the S-LANSS was significantly related to a positive total S-LANSS score and the presence of neuropathic pain, confirming the contribution of each item to the overall score and the discriminant and construct validity of the S-LANSS (Table 4).

Reliability

Cronbach's coefficient was 0.74 for the first application and 0.73 for the second application of the S-LANSS. The internal consistency between the items of the scale was high. Thus, both applications of the S-LANSS led to a reliable classification of patients with chronic pain.

Test–retest Reliability

Total S-LANSS scores of the subjects were not significantly different between applications (11.65 ± 6.9 and

Table 3 Sensitivity and specificity of the S-LANSS for the first and second applications and the optimum cutoff scores

	First Application		Second Application	
S-LANSS	Cutoff Score ≥ 12	Cutoff Score ≥ 10	Cutoff Score ≥ 12	Cutoff Score ≥ 10
Sensitivity	72.3 (64.0–79.6)	78.8 (71.0–85.3)	72.3 (64.0–79.6)	78.1 (70.2–84.7)
Specificity	80.4 (71.6–87.4)	76.6 (67.5–84.3)	80.4 (71.6–87.4)	78.5 (69.5–85.9)
Positive predictive value	82.5	81.2	82.5	82.3
Negative predictive value	69.4	73.9	69.4	73.7

Table 4 Odds ratio for positive S-LANSS items in detecting clinically-diagnosed neuropathic pain

	First Application Presence of Neuropathic Pain	Positive LANSS ≥ 12	Second Application Presence of Neuropathic Pain	Positive LANSS ≥ 12
Item 1 (Dyesthesia)	9.7 (3.8–24.3)	53.6 (7.2–298.4)	9.3 (3.7–23.3)	50.5 (6.8–375.1)
Item 2 (autonomic)	10.3 (4.2–25.1)	12.1 (5.2–28.1)	10.6 (4.3–25.9)	10.5 (4.7–23.4)
Item 3 (evoked)	3.7 (2.1–6.5)	6.5 (3.7–11.6)	3.6 (2.1–6.4)	5.3 (3.0–9.3)
Item 4 (paroxysmal)	1.9 (1.1–3.3)	11.9 (1.1–3.2)	1.9 (1.1–3.4)	1.8 (1.0–2.9)
Item 5 (thermal)	5.3 (2.9–9.5)	6.9 (3.8–12.6)	6.1 (3.3–11.3)	7.4 (4.1–13.4)
Item 6 (allodynia)	7.4 (4.2–13.2)	234.1 (82.2–666.8)	8.0 (4.9–15.9)	317.6 (103.6–973.8)
Item 7 (Tender/numb)	8.5 (4.7–15.4)	102.6 (42.6–247.3)	8.6 (4.7–15.7)	101.4 (40.4–254.2)

11.5 ± 6.9, respectively; $P = 0.46$). Mean S-LANSS score was not different between applications in either nociceptive ($P = 0.75$) or neuropathic pain patients ($P = 0.29$). The mean S-LANSS score for the first and second applications was, however, significantly different between the clinically-diagnosed neuropathic and nociceptive groups, as expected (Table 5). The median S-LANSS scores were significantly different ($P < 0.001$) between the clinically-diagnosed neuropathic and nociceptive pain groups, with scores of 19 and 10, respectively (Table 5).

Reliability (Test-Retest Stability)

To assess the reproducibility of the S-LANSS, participants completed the questionnaire for the second time 2 weeks after the first test. The scores of two S-LANSS applications 1 week apart did not differ statistically. There were no significant differences in the total scores or item scores between two applications of the S-LANSS in neuropathic patients and nociceptive patients ($P > 0.05$) (Table 6). For these two sets of measurements, Pearson's correlation coefficient was r: 0.97 $P < 0.01$, which is fairly high for a self-assessment tool. The correlation coefficient and the P value for test–retest measurements in the S-LANSS are shown in Table 7.

Discussion

The S-LANSS, first developed in English, is a short, self-administered questionnaire that was developed to aid in the diagnosis of neuropathic pain [23]. Although it is easy to administer, it is not available in other languages. This study represents the first validation of the S-LANSS questionnaire translated into another language, Turkish. An important goal of this study was to develop the Turkish version of S-LANSS for diagnosis of the origin of chronic pain. The present study evaluated the reliability and validity of the Turkish version of the S-LANSS for use in chronic pain patients. Our study demonstrates that the S-LANSS is a valid and reliable self-diagnosis tool for identifying neuropathic pain and nociceptive pain in a Turkish population. Scores for the S-LANSS items from patients with neuropathic and nociceptive pain were comparable to coefficients reported in the literature for clinical and epidemiologic studies [23–26]. Overall, our results confirm the high discriminant value of the Turkish version of the S-LANSS questionnaire for identification of neuropathic pain in patients with chronic pain. We validated the S-LANSS against clinical judgment as the gold standard, considered to be reliable marker of neuropathic pain in clinical settings.

Interviews using the S-LANSS are reported to lead to a more reliable classification of patients with nociceptive pain than self-completion of the test, compared with clinical diagnosis. The results of the self-completed tests, however, were as reliable as the results of tests performed in conjunction with an interview in Bennett's study for diagnosing neuropathic pain in chronic pain patients. Bennett et al. reported that the sensitivity and specificity of

Table 5 Mean median scores and standard deviations in S-LANSS Scale in 1st and 2nd application of the questionnaire

	All patients (N: 244)		Neuropathic Pain (N: 137)		Nociceptive Pain (N: 107)	
	1st application	2nd application	1st application	2nd application	1st application	2nd application
S-LANSS	11.65 ± 6.9	11.5 ± 6.9	15.27 ± 5.90	15.23 ± 5.8	7.01 ± 5.23	6.83 ± 4.98
Median	11	11	17	16	5	5
%25	5	5	11	11	3	3
%75	18	17	19	19	10	10
P value	0.46		0.75		0.29	

Table 6 Mean S-LANSS scores for each item in the 1st and 2nd applications in total patients and in each group

	Total (N: 244)			Nociceptive (N: 107)			Neuropathic (N: 137)		
Item	First	Second	*P* value	First	Second	*P* value	First	Second	*P* value
1	4.20 ± 1.84	4.22 ± 1.81	0.32	3.46 ± 2.32	3.50 ± 2.30	0.32	4.78 ± 1.03	4.78 ± 1.03	>0.05
2	1.19 ± 2.13	1.21 ± 2.14	0.56	0.28 ± 1.16	0.28 ± 1.16	>0.05	1.90 ± 2.43	1.93 ± 2.44	0.57
3	1.21 ± 1.47	1.20 ± 1.47	0.71	0.70 ± 1.27	0.70 ± 1.27	0.16	1.60 ± 1.50	1.58 ± 1.50	0.66
4	0.75 ± 0.97	0.71 ± 0.96	0.10	0.58 ± 0.91	0.54 ± 0.89	0.16	0.88 ± 0.99	0.85 ± 0.99	0.32
5	0.39 ± 0.49	0.39 ± 0.49	0.56	0.19 ± 0.39	0.17 ± 0.38	0.16	0.55 ± 0.50	0.55 ± 0.49	0.32
6	2.46 ± 2.51	2.46 ± 2.51	0.0	1.17 ± 2.12	2.46 ± 2.06	0.26	3.47 ± 2.31	3.54 ± 2.28	0.32
7	1.46 ± 1.50	1.36 ± 1.49	0.03	0.64 ± 1.24	0.56 ± 1.18	0.32	2.10 ± 1.38	1.99 ± 1.42	0.06

the S-LANSS were 74% and 76%, respectively [23], consistent with our results. We compared our results with those of the gold standard (clinical examination); the S-LANSS correctly identified neuropathic pain with a sensitivity and specificity of 72.3% and 80.4%, respectively. Although the interview format is reported to improve specificity more than sensitivity of the S-LANSS score, we did not compare unaided and aided formats in our patients in anticipation that the self-instrument will be used in epidemiologic studies. Further, the aided format did not add significantly to either the sensitivity or specificity in the previous study [23].

Our study provides new information about the test–retest reliability of the questionnaire, which was not examined in previous studies. We used test–retest analysis for validation and reliability methods. The internal consistency of each scale was estimated by a Cronbach's alpha coefficient. Based on the literature, the internal consistency coefficient of a measurement device must be at least 0.70; when the value is lower, the device can only be used as a complementary tool or for research analysis. A Cronbach's alpha coefficient of greater than 0.70 in the present study suggests that the Turkish version of S-LANSS is reliable. To evaluate test–retest reliability, patients were reinvited to take the test in 7 days after the initial test. The second interviews were conducted a short time after the initial interview because of factors such as the intrinsic fluctuating nature of some chronic pain syndromes, progressive prognosis of chronic pain and confounding effect of therapeutic intervention. When total points of the subjects were taken into consideration, there were no statistically significant differences between the two applications. These results are consistent with those of a reliability study of the original version performed with 200 subjects [23].

The Cronbach's alpha coefficients of the two applications (0.74 and 0.73, respectively) revealed a high level ($P < 0.0001$) of statistical significance for scale reliability. Bennett et al. reported a Cronbach's alpha of 0.76 for the S-LANSS, and our results were comparable. The correlation results for both the total items and each item was high, suggesting the reliability of the test items. When total item correlations were evaluated, a Pearson's correlation coefficient of 0.40 and above indicated that the scale was highly reliable. To consider a scale reliable, the Pearson

Table 7 Test-retest stability evaluated with pearson coefficients for each item and the total S-LANSS score

	All Patients		Nociceptive		Neuropathic	
Questions	Correlation Coefficients	*P* value	Nociceptive	*P* value	Neuropathic	*P* value
1.	0.98	<0.01	0.98	<0.01	1	<0.01
2.	0.96	<0.01	1	<0.01	0.95	<0.01
3.	0.94	<0.01	0.94	<0.01	0.93	<0.01
4.	0.95	<0.01	0.95	<0.01	0.94	<0.01
5.	0.97	<0.01	0.94	<0.01	0.98	<0.01
6.	0.95	<0.01	0.95	<0.01	0.93	<0.01
7.	0.89	<0.01	0.800	<0.01	0.88	<0.01
Total score	0.97	<0.01	0.96	<0.01	0.97	<0.01

correlation coefficient of the item total score correlation analyses must be 0.40 or above [10]. Our results were all above this value and consistent with the results of other studies [23–26].

To tackle the problem of chronic pain, either neuropathic or nociceptive, epidemiologic data about the severity and treatment of neuropathic pain using standardized diagnostic pain assessment tools is needed. The majority of studies on pain assessment in the general population have used a modified verbal rating scale. In Turkey, there are three commonly used pain assessment tools: a simple descriptive pain intensity scale, a 0–10 numeric pain intensity scale, and a visual analog scale (VAS). The findings of the present study indicate that the Turkish version of the S-LANNS is a reliable and valid measure of pain diagnosis in chronic pain patients.

Limitations

The S-LANSS is proposed to be valuable in a variety of chronic pain settings, but the present study was performed only in a clinical setting. Although these findings support the generalizability of the results, the precision of the test needs to be further evaluated in epidemiologic studies. Our aim was to develop a Turkish version of the test and to perform validity and reliability studies first in the clinic and next in the general population. We also performed a test–retest analysis with these clinical trial. In this study, we sought to include neuropathic and nociceptive pain patients and to collect data with as little interference with the natural doctor–patient relationship as possible. Thus, we aimed to include chronic patients who were experiencing pain at levels of at least 2 points on VAS for our data collection. Although we did not obtain a representative sample of all chronic pain patients, these results can be generalized to that population. Validity tests of Turkish S-LANSS should next be performed in an epidemiologic study.

Conclusions

The accurate assessment of pain in chronic pain patients is important. Diagnostic tools to more accurately determine the etiology of pain in patients with chronic pain are valuable for both epidemiologic and clinical studies. The test–retest reliability of the Turkish version of this questionnaire is satisfactory. Thus, the S-LANSS is a reliable and suitable tool for pain studies and health care professionals. Our results are consistent with findings reported in the literature that the S-LANSS, compared with other generic pain measures, provides a sensitive and thorough presentation of the diagnostic properties of pain. Pain diagnosis is an important component in the treatment of chronic pain patients, and progress in this area will be improved by the development of appropriate diagnostic tools. Clinical pain practice and epidemiologic research often necessitate an exclusive tool for pain diagnosis that is easy to use and interpret and is applicable across patients whose pain has different etiologies. The results of the present study support the use of the Turkish S-LANSS for this purpose.

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