

Brazilian Portuguese Validation of the Leeds Assessment of Neuropathic Symptoms and Signs for Patients with Chronic Pain

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Abstract

Background. Neuropathic pain (NP) is a very frequent and unrecognized condition in clinical practice. Therefore, it is important to have a reliable instrument to assess pain subtypes in various cultures. The Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) has been widely used and validated in many countries. Up to now, there has been no reliability study of this instrument in Brazil.

Methods. The scores of the Brazilian Portuguese version of the LANSS were studied in a sample of 90 chronic pain outpatients from southern Brazil. LANSS was translated into Portuguese and then back translated to English. Intraclass correlation coefficient (ICC) and internal consistency (IC) were estimated. The intensity of pain complaints, other

demographic data, and LANSS scores distribution according to pain subtypes (nociceptive, neuropathic, and mixed) were also evaluated.

Results. The Brazilian Portuguese version of the LANSS showed good ICC ($r = 0.97$) and IC (Cronbach's $\alpha = 0.67$ for total LANSS score). Patients with NP provided significant higher LANSS scores (19.1 ± 3.3) in comparison with those with nociceptive (7.3 ± 4.5) and mixed (13.9 ± 3.7) types of pain.

Conclusions. This LANSS version was found to be a reliable instrument for the evaluation of pain complaints due to a variety of causes. The profile of pain scores was similar to that observed in other countries.

Key Words. Brazilian Portuguese Validation; Neuropathic Pain; Nociceptive Pain; LANSS

Introduction

Neuropathic pain (NP) is defined as pain initiated by a lesion or dysfunction of the somatosensory system as a result of abnormal activity of the nociceptive pathway [1,2]. Distinguishing nociceptive pain from NP is not only an academic issue [3]. This is important for the establishment of etiology, prognosis, and specific therapeutic strategies for chronic pain. However, this is not an easy task in clinical practice as the poorly myelinated fibers involved in NP are not detectable by conventional nerve conduction studies [4]. Apart from that, verbal descriptors for NP are quite imprecise. Recently, several assessment tools have been developed to aid in the diagnosis of NP [5–10]. Among the above-mentioned tools, the Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) pain scale is probably the easiest one to be used in clinical practice [6]. This scale proposes the use of the terms such as “pain of predominant neuropathic” or “pain of predominant nociceptive” types [11] as the coexistence of neuropathic and nociceptive pain is frequent in the same patient.

The pattern of painful symptoms may differ among various ethnic and cultural groups; therefore, it is important to have a reliable instrument to assess pain complaints in various settings. The LANSS scale has been validated for several languages, such as Spanish [12] and Turkish [13].

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However, no parameters of validation have been published for a Brazilian Portuguese version of LANSS yet. This study aimed to evaluate the intraclass correlation coefficient (ICC) and internal consistency (IC) of the Brazilian Portuguese version of the LANSS scale and also to assess the capability of the Brazilian LANSS version in discriminating different types of pain.

Methods

A cross-sectional study was conducted in a sample of chronic pain patients selected by consecutive referrals to the Neuromuscular and Rheumatology Clinics of Hospital de Clínicas de Porto Alegre, Brazil. The diagnosis of NP was done through clinical and laboratorial criteria [2], i.e., diabetic neuropathy or postherpetic neuralgia. Nociceptive pain was considered when there was clinical and/or laboratorial evidence of nonneural tissue damage, i.e., osteoarthritis (positive X-ray plus swollen joints) or myofascial pain (compatible history with presence of trigger points) and with normal electrophysiological studies. Patients with mixed types of pain were those with both neural and nonneural tissues involved, i.e., radiculopathy or carpal tunnel syndrome. Eligibility criteria also included age more than 18 years, Portuguese native speaker from Brazil, and having chronic pain, defined as pain of more than 3 months in duration.

The original English versions of the LANSS scale was translated into Brazilian Portuguese by two Portuguese native speakers who work in the area of neurology and are both fluent in English. Those neurologists adapted some expressions according to cultural Brazilian peculiarities. Subsequently, the Brazilian Portuguese version was back translated into English by an English native speaking physician who has been living in Brazil for the past 3 years. Final adaptations were carried out further to ensure full cultural and educational comprehension, and this version was sent to the original author (MIB) for corrections (see final Portuguese version in Appendix 1).

The LANSS scale consists of a total of seven items including a five-item questionnaire regarding pain symptoms and two items involving sensory tests for the presence of allodynia and decreased sensation to pinprick [6,14]. For pinprick testing, a 23-gauge needle was supported in a syringe barrel perpendicularly placed in contact with the patient's skin for several times so that only the mass could exert downward pressure and not the examiner. Hyperalgesia was judged to be present when pinprick testing elicited an exaggerated painful response at the index site compared with the control site. Allodynia was also judged to be present when pain was elicited by gently stroking a piece of cotton wool over the index site and when normal sensation was experienced in the control site.

Responses to the items were a "yes or no" type and were weighted differently depending upon the question. Responses are then summed to calculate a total score from 0 to 24. Scores below 12 suggested pain with noci-

ceptive predominance, whereas scores above 12 suggested pain with neuropathic predominance.

Additionally, we also noted demographic variables, as well as visual analog scale for pain intensity (VAS-INT) and visual analog scale for impact on activities of daily living (VAS-ADL) in the last 2 months. The study was approved by the Ethic Committee for Medical Research of the Hospital de Clínicas de Porto Alegre. All patients signed an informed consent before being enrolled into the study.

Procedure

The interviews followed the same structure and scoring methods described in the original English versions [6], and they were performed twice by two trained and independent neurologists. The evaluators (PS and VFT) were blind to the disease of the patient and to the results of LANSS scores obtained by each other. The interviews were made with an interval of at least 1 day between them.

Data Reduction and Statistical Analyses

Descriptive statistics (mean, standard deviation, and frequency) were calculated for demographic data and LANSS scores. The patients were grouped into three: those with nociceptive, neuropathic, and mixed types of pain. LANSS scores were then compared using ANOVA followed by Bonferroni's test. Correlation coefficients were estimated for the ICC on the total LANSS, and IC was analyzed by Cronbach's α coefficient. A P value <0.05 was considered as statistically significant.

Results

There were no significant differences regarding sex, age, years of education, and VAS-INT scores between groups (nociceptive, neuropathic, and mixed ones). However, patients with NP had significant higher scores of VAS-ADL in comparison with those with nociceptive and mixed types of pain. Indeed, there was a moderate correlation between LANSS scores and VAS-ADL ($r^2 = 0.46$; $P < 0.001$) and a weak correlation between LANSS scores and VAS-INT ($r^2 = 0.29$; $P = 0.006$). Table 1 shows the demographic characteristics of groups, whereas Table 2 shows the clinical conditions of all patients according to their pain classification.

The ICC for the two independent evaluators was $r = 0.97$ ($P < 0.001$) and Cronbach's α coefficient for IC was 0.67 for the total LANSS score ($P = 0.001$).

LANSS total scores were different between groups ($F[2,87] = 82.24$; $P < 0.001$). Post hoc analysis showed that differences were due to higher scores in NP patients (19.1 ± 3.3) followed by nociceptive (7.3 ± 4.5) and mixed (13.9 ± 3.7) pain patients (Bonferroni's test < 0.001 for all comparisons). Figure 1 shows the distribution of LANSS according to pain subtypes.

Table 1 Pain classification based on etiology (number of patients in parenthesis)

Neuropathic Pain (34)	Mixed Pain (12)	Nociceptive Pain (44)
Polyneuropathies (21) — Diabetic (9) — Infectious (9) — Alcohol (1) — Drug induced (1) — Idiopathic (1) Trigeminal neuralgia (3) Postherpetic neuralgia (2) CRPS I (2) CRPS II (2) Traumatic nerve injury (2) Phantom limb (1) Idiopathic plexopathy (1)	Radiculopathy (8) Entrapment (4)	Osteoarthritis (18) Myofascial (15) Low back pain (4) Rheumatoid arthritis (3) Ankylosing spondylitis (1) Plantar fasciitis (1) Gout (1) Bursitis (1)

CRPS = complex regional pain syndrome; HIV = human immunodeficiency virus.

Table 2 Demographic data according to pain classification

	Nociceptive (N = 44)	Mixed (N = 12)	Neuropathic (N = 34)	P
Age (ys)	55.5 ± 14.2	48.7 ± 10.6	54.0 ± 12.0	0.2
Weight (kg)	71.7 ± 14.7	77.1 ± 11.7	73.1 ± 15.0	0.5
Height (cm)	165.4 ± 9.8	170.5 ± 7.2	168.2 ± 9.5	0.1
Education (year)	8.7 ± 3.3	6.9 ± 3.1	9.4 ± 3.7	0.1
VAS-INT (0–10)	6.7 ± 2.2	6.9 ± 2.5	7.6 ± 1.5	0.1
VAS-ADL (0–10)	5.9 ± 2.6	6.8 ± 2.5	7.5 ± 2.1	0.03

VAS-ADL = visual analog scale for impact on activities of daily living; VAS-INT = visual analog scale for pain intensity.

The Pearson coefficient correlation was 0.89 ($P = 0.01$) for the total LANSS scores between the assessment of two independent evaluators. Indeed, there were no differences regarding the mean LANSS score between the first and

second interviews (12.8 ± 6.5 vs 12.6 ± 6.8 ; Student's t -test; $P = 0.6$).

Discussion

Our study of the Brazilian Portuguese version of the LANSS has demonstrated that is a reliable instrument. Indeed, both ICC and Cronbach's coefficient were as good as those obtained by Spanish [12] and Turkish [13] groups. We also found that NP is one of the most disabling types of pain in terms of the impact on the activities of daily living in comparison with nociceptive and mixed subtypes, and this illustrates the importance of an accurate diagnosis of pain.

Distinguishing NP from nociceptive pain is difficult for several reasons [15]. First, the perception of NP is purely subjective, which means that despite the use of the most sophisticated equipment, NP intensity cannot be measured. Second, in contrast to other sensory systems, the pain system is not static, but on contrary, it changes in a dynamic and somewhat unpredictable fashion whenever the system is activated. Third, signs and symptoms of NP may change during the course of the disease if it becomes chronic. Finally, neuropathic and nociceptive mechanisms may coexist, and the clinician must decide whether neu-

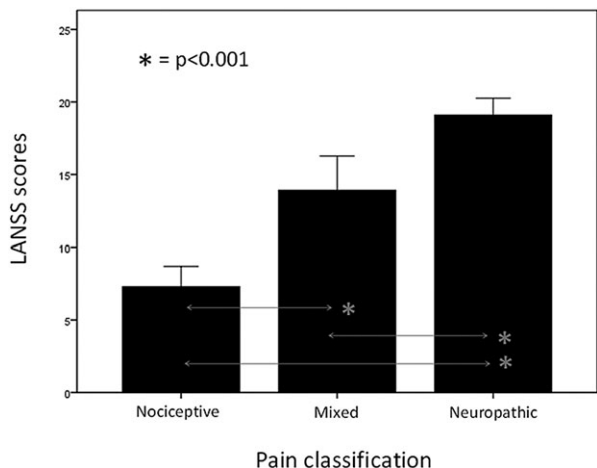


Figure 1 LANSS scores according to pain classification.

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ropathic mechanisms predominate in the patient's overall pain experience [11]. Therefore, when diseases or disorders are dominated by subjective symptoms, and the associated clinical signs are few or absent, the requirement for diagnostic screening tools becomes crucial.

One of the advantages of screening tools, such as the LANSS scale, is that they can also be used by nonspecialists, and this is important because the estimated prevalence of NP can reach 8% in the general population [16]. As they are very easy to use by both clinicians and patients, these instruments are very attractive because they provide immediate and reliable information. However, pain descriptors themselves cannot make the diagnosis by themselves [8] and, indeed, screening tools do not identify about 10–20% of patients with NP [17]. If patients with NP are detected, clinicians should then undertake further assessment [18,19], which might affect subsequently diagnostic and therapeutic approaches [20].

In clinical practice, sometimes patients with nociceptive pain can be misdiagnosed as having NP [17]. In our study, for instance, several patients with clear musculoskeletal disorders answered "yes" to question number 5 addressing burning sensation. Indeed, burning sensation is not discriminative of NP [6,15] and can also be present in patients with osteoarthritis. Therefore, according to the LANSS scale, such a descriptor received low weight for supporting the NP diagnosis. Sometimes, low-level education subjects can misinterpret questions regarding sensory symptoms [21]. In our study, however, there were no significant differences in years of education between groups, reflecting the lack of influence of education levels for pain diagnosis using the LANSS.

The LANSS scale was able to differentiate patients with neuropathic, nociceptive, and mixed types of pain. This is very important for clinical studies of analgesic drugs. Inclusion in trials of patients with mixed pain, instead of NP, would usually be inappropriate and could explain the usual refractoriness of NP drugs [2]. It is important to stress that NP and other types of pains are often present in the same patient and that LANSS can help in identifying such conditions. The coexistence of different types of pain can influence the results of drug trials; i.e., patients with mixed pain may not respond to antiepileptic drugs as much as patients with pure NP. For example, as Backonja pointed out [7], patients with diabetic neuropathy affecting the distal legs may also have some inflammatory pain from diabetic ulcer, and this could explain the reason why an anti-NP drug is refractory in some cases of painful diabetic neuropathies. In the same way, Treede et al. [2] recommend that more stringent criteria should be used in drug trials than those used in epidemiological studies. Indeed, its inclusion in trials involving patients with possible, rather than definitive or probable, NP, i.e., LANSS scores below 20 points, would be inappropriate for the assessment of drug efficacy.

In the last few years, many common diseases and intake of drugs have been linked with NP because of small fiber

lesions, such as human immunodeficiency virus infection [22], prediabetes [23], hypothyroidism [24], alcoholism [25], hyperlipidemia [26], statin [27], and metformin [28] use. Indeed, the most common cause of polyneuropathy, the chronic idiopathic axonal form, is recognized by small fiber affection and NP in the early phases of a disease [29]. Therefore, because chronic pain is also very common in the general population, the use of LANSS could also help to diagnose such conditions in clinical practice. For instance, patients with chronic pain and high LANSS scores should be more carefully watched and investigated.

The LANSS scale application has received some criticism regarding methodological concerns, especially about the safety of the pinprick test [30]. Differently from Dr. Backonja and Dr. Krause's experience [31], we did not have any skin bleeding episodes during the 23-gauge needle examination in our 90 patients, in the same way as Bennett's [6] and other authors' [12,13] experiences. In any case, a 23-gauge needle used in the LANSS assessment can be alternatively replaced by 1-g monofilaments [32] in patients with thin and fragile skin such as the elderly or in patients with complex regional pain syndrome.

Our study has some limitations. First, our sample size was only of moderate size, and it was drawn from only one clinic, which may limit the ability to generalize the findings to all settings. However, we adapted carefully the LANSS for the patients' understanding. Also, we used two assessors instead of only one, who were blind to each other's findings, and this contributed to the strength of our work. Second, we did not include other important clinical parameters such as impact of pain on sleep and quality of life. However, the VAS-ADL could have been roughly provided similar information. Third, we retested patients in a relatively short period of time, and this could have induced a memory bias to the LANSS answers. However, if longer intervals of retesting were used, progression or regression of the disease may have been seen, compromising the IC of our results.

In conclusion, the Portuguese version of the LANSS scale from Brazil is reliable for use in clinical practice and research. This is an important achievement because the information taken from the LANSS is vital to understand the distribution, etiology, and natural history of NP.

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Appendix 1: Portuguese Version from Brazil of LANSS Scale

Nome: _____ Data: _____

Esta escala de dor ajuda a determinar como os nervos que carregam a informação de dor estão funcionando. É importante obter este tipo de informação, pois ela pode ajudar na escolha de um tratamento específico para o seu tipo de dor.

A. QUESTIONÁRIO DE DOR

- Pense na dor que você vem sentindo na última semana.
- Por favor, diga se qualquer uma das características abaixo se aplica a sua dor. Responda apenas SIM ou NÃO.

1. A sua dor se parece com uma sensação estranha e desagradável na pele? Palavras do tipo “agulhadas,” “choques elétricos” e “formigamento” são as que melhor descrevem estas sensações.
 - a. NÃO—Minha dor não se parece com is [0]
 - b. SIM—Eu tenho este tipo de sensação com freqüência [5]
 2. A sua dor faz com que a cor da pele dolorida mude de cor? Palavras do tipo “manchada” ou “avermelhada ou rosada” descrevem a aparência da sua pele.
 - a. NÃO—Minha dor não afeta a cor da minha pele [0]
 - b. SIM—Eu percebi que a dor faz com que minha pele mude de cor [5]
 3. A sua dor faz com a pele afetada fique sensível ao toque? A ocorrência de sensações desagradáveis e/ou dolorosas ao toque leve ou mesmo ao toque da roupa ao vestir-se descrevem esta sensibilidade anormal.
 - a. NÃO—Minha dor não faz com que minha pele fique mais sensível nesta área [0]
 - b. SIM—Minha pele é mais sensível ao toque nesta área [3]
 4. A sua dor inicia de repente, sem nenhuma razão aparente, quando você está parado? Palavras tipo “choques elétricos,” “dor em pontada” ou “dor explosiva” descrevem estas sensações.
 - a. NÃO—Minha dor não é sentida desta forma [0]
 - b. SIM—Eu tenho estas sensações com muita freqüência [2]
 5. A sua dor faz com que a temperatura da sua pele na área dolorida mude? Palavras tipo “calor” e “queimação” descrevem estas sensações.
 - a. NÃO—Eu não tenho este tipo de sensação [0]
 - b. SIM—Eu tenho estas sensações com freqüência [1]
- B. EXAME DA SENSIBILIDADE: A sensibilidade da pele pode ser examinada comparando-se a área dolorida com a área contralateral ou nas áreas adjacentes não-doloridas avaliando a presença de alodinia e alteração do limiar de sensação ao estímulo da agulha (LSA).
6. ALODINIA: Examine a resposta ao toque leve com algodão sobre a área não-dolorida e, a seguir, na área dolorida. Caso sensações normais forem percebidas no lado não-dolorido e, ao contrário, se dor ou sensações desagradáveis (sensação tipo “picada” ou “latejante”) forem percebidas na área afetada, então a alodinia está presente.
 - a. NÃO—Sensação normal em ambas as áreas [0]
 - b. SIM—Alodinia somente na área dolorida [5]

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7. ALTERAÇÃO DO LIMIAR POR ESTÍMULO DE AGULHA (LEA)

- a. Determine o LEA através da comparação da resposta a uma agulha de espessura 23 (cor azul) conectada a uma seringa de 2 mL—sem a parte interna—suavemente colocada nas áreas doloridas da pele e depois nas não-doloridas.
- b. Caso uma sensação de agulhada normal for sentida na área da pele não-dolorida, mas uma sensação diferente for sentida na área dolorida como, por exemplo “nenhuma sensação” ou “somente sensação de toque” (LEA aumentado) ou “dor muito intensa” (LEA diminuído), isso significa que há um LEA alterado.
- c. Caso a sensação de agulhada não for percebida em nenhuma área, conecte a parte interna da seringa à agulha para aumentar o peso e repita a manobra.
 - a. NÃO—Sensação igual em ambas áreas [0]
 - b. SIM—Limiar por estímulo de agulha alterado no lado dolorido [3]

ESCORE:

Some os valores entre parênteses nos achados descritivos e de exame da sensibilidade para obter um escore global

ESCORE TOTAL (máximo 24): _____

Se o escore < 12, mecanismos neuropáticos são improváveis de estarem contribuindo para a dor do paciente.

Se escore ≥ 12, mecanismos neuropáticos provavelmente estão contribuindo para a dor do paciente.