

Validity and Reliability of Turkish Version of the Identification Pain Questionnaire in the Assessment of Neuropathic Pain

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ABSTRACT

Objectives: This study aims to assess the validity and reliability of a Turkish version of the identification (ID) pain (ID pain-T) questionnaire in Turkish patients.

Patients and methods: The Turkish version of ID pain questionnaire was obtained after translation from English into Turkish. The study included 194 patients of which 100 (34 males, 66 females; mean age 59.8±14.3 years; range, 28 to 88 years) were diagnosed as neuropathic pain (NP) and 94 (31 males, 63 females; mean age 47.2±16.5 years; range, 20 to 78 years) were diagnosed as non-neuropathic pain. Patients with mixed-type pain, cancer pain, headaches, substance abuse, severe depression or fibromyalgia syndrome were excluded.

Results: The reliability and consistency of ID pain-T questionnaire were acceptable, with a Cronbach's alpha coefficient of 0.701. Statistical analysis of the ID pain-T questionnaire calculated an optimal cut-off score of ≥2 for determining NP with a sensitivity of 77.2% and a specificity of 85%. Further, with an excellent value of 0.92 for area under the curve, a good diagnostic value was indicated.

Conclusion: The Turkish version of ID pain questionnaire assessed in the present study is a valid and reliable self-administered questionnaire to identify NP in Turkish patients.

Keywords: Identification pain questionnaire; neuropathic pain; outcome measures.

Neuropathic pain (NP) is defined as “pain arising as a direct consequence of a lesion or disease affecting the somatosensory system,” by the International Association for the Study of Pain Special Interest Group on Neuropathic Pain.¹ NP is a chronic pain disorder caused by a lesion or disease of the somatosensory system and affects millions of people all over the world.¹ This pain type is different from nociceptive pain (non-neuropathic pain, NNP), having different underlying mechanisms and treatment modalities.² NNP is defined as a type of pain which is generated by the application of stimuli producing damage or injury to somatic or visceral organs,

while NP is defined as pain produced by injuries or diseases affecting the somatosensory paths of the peripheral or central nervous system.³⁻⁵ NP symptoms can be seen as spontaneous or trigger-induced, stabbing, electric shock type, burning, sharp, shooting, pressure, squeezing, deep, aching and cold pain.^{6,7}

Neuropathic pain diagnosis is established by clinical examination based on patient history, searching neurologic pathologies and perturbations in sensory functioning. The diagnosis is challenging in many patients and it is difficult to select the appropriate management

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and avoid overdiagnosis.⁸⁻¹⁰ Although specific questionnaires for NP were developed, it is difficult to use such tools routinely in primary care settings. There was a need for a brief, self-administered tool that could be used to screen for the presence of NP; thus identification (ID) pain questionnaire was developed.¹¹

Identification pain questionnaire is a six-item screening questionnaire, including five sensory descriptor items and one item related to joint pain. The item related to joint pain identifies NNP. The ID pain tool seems to reveal the presence of neuropathic component of pain accurately.¹² On the other hand, this questionnaire includes a body figure on which the patient can mark the location of pain; however, this marking has no effect on scoring of the questionnaire and may help the clinician about the management of symptoms. Because of being a self-administered and simple tool, ID pain questionnaire has been translated into several languages.¹²⁻¹⁵ Therefore, in this study, we aimed to assess the validity and reliability of a Turkish version of the ID pain (ID pain-T) questionnaire in Turkish patients.

PATIENTS AND METHODS

This cross-cultural adaptation and validation study was conducted at Ufuk University Faculty of Medicine Hospital between November 2016 and November 2017. ID pain questionnaire was adapted to Turkish population by using the recommended guidelines for cross-cultural adaptation.¹⁶ First, four native Turkish-speaking physicians, a construction engineer and a teacher translated the English ID pain questionnaire into Turkish and then the Turkish questionnaire was back-translated into English by a native English speaker who was blinded to original questionnaire and used Turkish fluently. The most accurate Turkish translation was chosen by authors. A pilot group including 30 patients (12 males, 18 females; 54.0 ± 14.7 years; range, 26 to 80 years) with pain complaints were asked to complete the chosen questionnaire and asked if they had any difficulties in understanding the questions. A final revision was made to assess the appropriateness of the translated questionnaire. The study protocol was approved by the Ufuk University Ethics Committee. A written informed

consent was obtained from each patient. The study was conducted in accordance with the principles of the Declaration of Helsinki.

The study included 194 patients of which 100 (34 males, 66 females; mean age 59.8 ± 14.3 years; range, 28 to 88 years) were diagnosed as NP and 94 (31 males, 63 females; mean age 47.2 ± 16.5 years; range, 20 to 78 years) were diagnosed as NNP. Patients with a pain complement in one or more anatomical location for more than three months and who had not participated in another pain study within the past 30 days were included. Patients with mixed-type pain, cancer pain, headaches, substance abuse, severe depression or fibromyalgia syndrome were excluded. Musculoskeletal and neurological examinations of the patients were performed. NP was determined by the Douleur Neuropathique 4 (DN4) questionnaire. The DN4 questionnaire was originally developed for NP diagnosis, consisting of seven items related to symptoms and three related to clinical examination.⁵ For each item, a score of "1" is given if the response is "yes" and a score of "0" is given if it is "no". The patient is considered to have NP if the total score is calculated to be 4 or more. The reliability and validity study of Turkish version of DN4 was performed by Unal-Cevik et al.¹⁷

Eligible subjects completed the ID pain-T questionnaire by themselves in a waiting room and returned it in a sealed envelope. ID pain-T questionnaire consists of six items: "Yes" answers to questions 1-5 were given a score of 1, while "yes" answer to question 6 scored -1. "No" answers to questions 1-5 were given a score of 0, while "yes" answer to question 6 scored 0.¹⁸

Statistical analysis

Socio-demographic and clinical characteristics of patients were summarized for the whole sample (NP and NNP groups) using frequency (%) for categorical variables and mean (standard deviation) for continuous variables. All data for normality were tested by using the Kolmogorov-Smirnov test. To compare the differences between the groups, the Mann-Whitney U test was used.

The ID pain-T questionnaire responses were collected in two sessions with at least three days between the sessions for pre- and post-assessment. Reliability of ID pain-T questionnaire

Table 1. Comparison of demographic data and clinical characteristics of patients between neuropathic and non-neuropathic pain groups

| | Neuropathic pain (NP) group (n=100) | | | Non-neuropathic pain (NNP) group (n=94) | | | p |
|--------------------------------|-------------------------------------|----|-----------|---|------|-----------|---------|
| | n | % | Mean±SD | n | % | Mean±SD | |
| Age (year) | | | 59.8±14.3 | | | 47.2±16.5 | 0.001** |
| Gender | | | | | | | 0.881 |
| Female | 66 | | | 63 | | | |
| Male | 34 | | | 31 | | | |
| Education level | | | | | | | 0.001** |
| Low (≤8 years) | 27 | 27 | | 3 | 3.2 | | |
| High (>8 years) | 73 | 73 | | 91 | 86.8 | | |
| Occupation | | | | | | | |
| Employed | 34 | 34 | | 63 | 67 | | 0.001** |
| Unemployed | 66 | 66 | | 31 | 33 | | 0.005** |
| Duration of pain (years) | | | 4.3±3.4 | | | 2.7±1.3 | 0.005** |
| Medication use for pain relief | | | | | | | 0.001** |
| Medication | 86 | 86 | | 51 | 54.3 | | |
| No medication | 14 | 14 | | 43 | 45.7 | | |

SD: Standard deviation; * Mann-Whitney U test; ** p<0.05.

was tested by internal consistency and test-retest reliability. Internal consistency was evaluated by determining intraclass correlation coefficient (ICC) with 95% confidence interval, ranged between 0 and 1. Results more than 0.70 were accepted for reliability.^{19,20} To determine the internal consistency of the six items of the ID pain-T questionnaire, Cronbach's alpha (α) coefficient was computed for both pre- and post-assessment of the questionnaire.

Median (interquartile range) of total scores for ID pain-T questionnaire were calculated. Then, receiver operating characteristics curve (ROC) analysis was used to assess the discriminant validity of ID pain-T questionnaire for determining NP. In addition to the ROC curve, the area under the curve (AUC) was calculated to provide the predictive power of the questionnaire for the diagnosis of NP.

RESULTS

Demographic and clinical characteristics of the patients are shown in Table 1. The etiology of pain in all study population is shown in Table 2. The majority of patients had lumbar radiculopathy (n=34, 17.5%) and cervical radiculopathy (n=31, 15.9%) in NP group (Table 2).

The most frequent score in NP group was 3 (33%) and the most frequent scores in NNP

group were -1 (26%) and 2 (26%) (Table 3). There were statistically significant differences for all ID pain-T questionnaire total scores between the groups (p<0.0001) (Table 3).

The ID pain-T questionnaire was reliable for overall sample with Cronbach's α coefficients of 0.701 (pre-assessment) and 0.688 (post-assessment) (Table 4). The ICC between pre- and post-ID pain-T questionnaire total scores for overall sample was 0.975 (0.965-0.980); whereas, for NP and NNP groups, the ICC were

Table 2. Etiology of pain in study patients

| | n | % |
|------------------------------|----|-------|
| Neuropathic pain (n=100) | | |
| Lumbar radiculopathy | 34 | 17.5 |
| Cervical radiculopathy | 31 | 15.9 |
| Polyneuropathy | 18 | 9.3 |
| Post-herpetic neuralgia | 10 | 5.1 |
| Carpal tunnel syndrome | 4 | 2.0 |
| Post-stroke pain | 2 | 1.0 |
| Neuralgia paresthetica | 1 | 0.5 |
| Non-neuropathic pain (n=94) | | |
| Osteoarthritis | 21 | 10.82 |
| Cervical radiculopathy | 20 | 10.3 |
| Lumbar radiculopathy | 19 | 9.79 |
| Mechanical neck or back pain | 14 | 7.21 |
| Tendinitis | 8 | 4.1 |

Table 3. Turkish version of identification pain questionnaire scores classified according to neuropathic and non-neuropathic pain groups

| Score | Neuropathic pain group (n=100) | | Non-neuropathic pain group (n=94) | | p* |
|-------|--------------------------------|----|-----------------------------------|------|--------|
| | n | % | n | % | |
| -1 | 0 | 0 | 26 | 27.7 | 0.001† |
| 0 | 5 | 5 | 18 | 19.1 | 0.001† |
| 1 | 6 | 6 | 24 | 25.5 | 0.001† |
| 2 | 17 | 17 | 26 | 27.7 | 0.001† |
| 3 | 33 | 33 | 0 | 0 | 0.001† |
| 4 | 24 | 24 | 0 | 0 | 0.001† |
| 5 | 15 | 15 | 0 | 0 | 0.001† |

* Mann-Whitney U test; † p<0.05.

0.927 (0.891-0.951) and 0.961 (0.941-0.974) respectively (Table 4). Cronbach's α for the pre-assessment were 0.701, 0.423, and 0.381 for the overall sample, NP, and NNP groups, respectively. Similar values of Cronbach's α were observed for the post-assessment measures of ID pain-T questionnaire.

The medians for the ID pain-T questionnaire total scores were 3.10 (range, 0-5) and 0.53 (range, -1-2) in the NP and NNP groups,

respectively (p<0.001). There were 88 patients who were diagnosed as NP with a score of ≥ 2 both clinically and with ID pain-T questionnaire, giving a sensitivity of 77.2% (Table 5). In comparison, there were 68 patients who were diagnosed as NNP both clinically and with ID pain-T questionnaire, giving a specificity of 85% (Table 5). Total scores of ID pain-T questionnaire in study population were high, which correlated with the total scores in DN4 questionnaire (construct validity $r=0.61$,

Table 4. Test-retest and its internal consistency

| | Overall sample (n=194) | Neuropathic pain group (n=100) | Non-neuropathic pain group (n=94) |
|---|------------------------|--------------------------------|-----------------------------------|
| | ICC (95%) | ICC (95%) | ICC (95%) |
| Total Scale score: test-retest reliability | 0.975 (0.965-0.980) | 0.927 (0.891-0.951) | 0.961 (0.941-0.974) |
| | Cronbach's α | Cronbach's α | Cronbach's α |
| Pre-assessment | 0.701 | 0.423 | 0.381 |
| Post-assessment | 0.688 | 0.392 | 0.306 |

ICC (95 CI%): Intraclass correlation coefficient (95% confidence interval) for examining test-retest reliability of the questionnaire total score; Cronbach's α (alpha): Coefficient used to examine internal consistency of Turkish version of identification pain questionnaire.

Table 5. Statistical analysis comparing clinical diagnosis and Turkish version of identification pain questionnaire for neuropathic pain

| | Neuropathic pain group (n=100) | | Non-neuropathic pain group (n=94) | | p* |
|---|--------------------------------|------|-----------------------------------|------|---------|
| | n | % | n | % | |
| Neuropathic pain (ID pain-T total score ≥ 2) | 88 | 77.2 | 26 | 22.8 | <0.001† |
| Non-neuropathic pain (ID pain-T total score <2) | 12 | 15 | 68 | 85 | |

ID pain-T: Turkish version of identification pain questionnaire; * Mann-Whitney U test; † p<0.05.

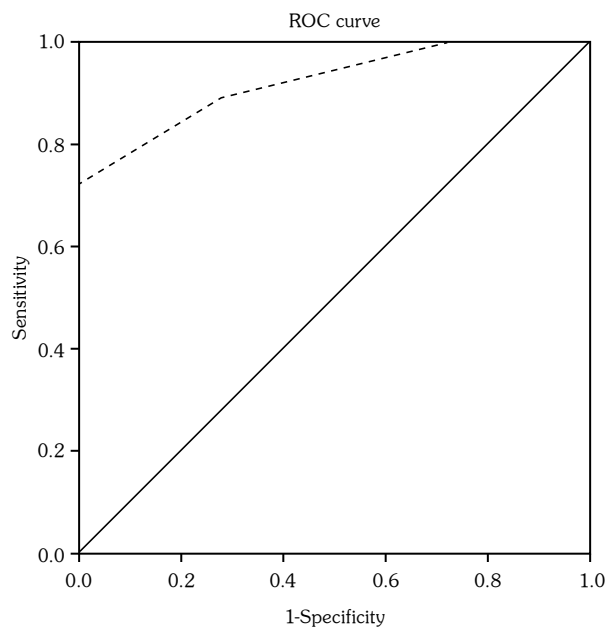


Figure 1. Receiver operating characteristics curve analysis: Plot of sensitivity area versus 1-specificity for Turkish version of identification pain questionnaire.

$p=0.001$ for NP group and $r=0.61$, $p=0.001$ for NNP group). When the ID pain-T questionnaire validity was evaluated with ROC curve and AUC analysis, a total score ≥ 2 points in ID pain-T questionnaire was found to be very effective to discriminate between neuropathic and non-neuropathic patients (AUC 0.92) (Figure 1).

DISCUSSION

Neuropathic pain diagnosis is challenging both for physicians and patients because of the subjective symptoms, absence of a standardized identification tool and limitation of the studies about the gold standard for the diagnosis of this pain type. Clinicians who do not have specific interest in pain, family practitioners and general healthcare givers need a short, simple and accurate tool for identifying NP. As an advantage, ID pain questionnaire has excellent brevity and simplicity because of taking only a few minutes and not needing any special physical examination. The previous studies demonstrated that ID pain questionnaire has high sensitivity and specificity for the diagnosis of NP.¹² In this study, we validated the ID pain-T questionnaire to be used in Turkish speaking NP patients.

A validation study for the Spanish version of ID pain questionnaire included 145 (51.2%) subjects with NP and 138 (48.8%) with NNP and demonstrated that with a cut-off value of ≥ 3 points, the AUC value was 0.89 with a sensitivity of 81% and specificity of 84%.¹² Another study for the Arabic version of ID pain questionnaire included 375 patients (153 with NP and 222 with NNP) and demonstrated that with a cut-off value of ≥ 2 points, the AUC value was 0.808 with a sensitivity of 84.3% and specificity of 73.9% (Cronbach α coefficient value 0.506).²¹ The Taiwan version of ID pain questionnaire included 317 patients and demonstrated that the reliability and consistency of the questionnaire were acceptable, with a Cronbach's α value of 0.6; they also calculated an optimal cut-off score of ≥ 2 for determining NP with 77% sensitivity and 74% specificity.²² In the Chinese ID pain questionnaire study conducted in Hong Kong with a cut-off score of ≥ 3 , an 81% specificity and 65% sensitivity were found with a Cronbach's α coefficient of 0.76.²³ Similar to these studies, our results suggested that ID pain-T questionnaire is a reliable and valuable tool to detect NP. When Cronbach's α coefficient was assessed to test for reliability, a score of 0.701 was found for this current study; it is well-known that Cronbach's α coefficient values above 0.7 are considered as good reliability for ID pain questionnaires.^{19,20} On the other hand, the ICC coefficient between pre- and post-ID pain-T questionnaire total scores also showed a high level of test-retest reliability. Further, with an excellent value of 0.92 for AUC, a good diagnostic value was indicated. Most importantly, with a cut-off value ≥ 2 , ID pain-T questionnaire demonstrated a sensitivity of 77.2% and specificity of 85%.

There are a number of questionnaires for screening patients with NP. However, inappropriate medication use may be seen in clinics where the availability of a pain physician is difficult. So, a questionnaire is needed which can be used by a general practitioner to correctly diagnose the pain type. As a power of our study, ID pain-T questionnaire can be administered by the patient himself with no need of a pain physician or another tool. On the other hand, a limitation of our study was that the demographic data between NP and NNP groups differed in terms of age, education level, occupation, duration of pain and medication use for pain relief.

In conclusion, the ID pain-T questionnaire assessed in the present study is a valid and reliable self-administered questionnaire to identify NP in Turkish patients. ID pain-T questionnaire is advantageous in the primary care settings and can be filled without a physician assistance; thus ID pain-T questionnaire is promising for being used in screening and diagnosis of various neuropathies in clinical settings.

Declaration of conflicting interests

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