# Reliability and validity of the Turkish version of Pain Assessment Checklist for Seniors with Limited Ability to Communicate (PACSLAC-T)

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**Background/aim:** This study aimed to assess validity and reliability of the Turkish version of Pain Assessment Checklist for Seniors with Limited Ability to Communicate (PACSLAC-T).

**Materials and methods:** The individuals who met inclusion criteria of the study were in patients of a hospital and a long-term care facility. Mini Mental Status Exam (MMSE), Cornell Dementia Depression Scale (CDDS), Global Deterioration Scale (GDS), visual analogue scale (VAS), and PACSLAC-T were administered to all subjects. The scales were repeated with an interval of two weeks for test–retest reliability.

**Results:** A total of 112 patients with dementia were included in the study. The intraclass correlation coefficient ICC for test–retest reliability of the PACSLAC-T was 0.713 with a 95% confidence interval of 0.486–0.843. The Cronbach's α coefficient for total PACSLAC-T was 0.842 for test and 0.888 for retest, which indicated substantial internal consistency. In convergent validity, there were significant correlations between PACSLAC-T total score VAS (r = 0.684, P < 0.001), while no correlation was found between PACSLAC-T total score and CDDS (r = 0.127, P = 0.094), and GDS (r = 0.096, P = 0.167). Also, significant correlations were found between PACSLAC-T total score and MMSE (r = –0.468, P = 0.016).

**Conclusion:** This study showed that PACSLAC-T could be a promising tool for the management of pain in older adults with limited communication skills.

**Key words:** Aged, assessment, pain, Pain Assessment Checklist for Seniors with Limited Ability to Communicate (PACSLAC)

## 1. Introduction

Having a great impact on quality of life, functionality, and medical health of the older adults, pain is set by the American Pain Society as the fifth most important symptom that needs to be taken into account (1). Pain is generally overlooked by the older adults, as it is believed to be an inevitable consequent of aging. Hence, they report the severity of their pain as one of the age-related problems (2). As it is understated in the older adults, pain is generally undertreated as well (3). Believing that pain goes along with aging results in treatment failure especially in older adults with cognitive impairment (4). Therefore, health professionals face difficulties in identifying and assessing pain in these patients (5). Since older adults with dementia have further difficulties in expressing their symptoms as a result of their physical and cognitive impairments, it is important for health care providers to appropriately assess their pain (6).

Facial expressions, vocalizations, body movements, changes in interpersonal interactions, activity patterns or routines, and mental status are the six main categories of nonverbal pain behaviors defined by American Geriatric Society (AGS) to assess pain in cognitively impaired older adults (7). The Discomfort Scale for Dementia of the Alzheimer's Type (8), Checklist of Nonverbal Pain Indicators (9), Doloplus 2 (10), Pain Assessment for the Demented Elderly (11), The Abbey Pain Scale (12), a nursing assistant-administered pain assessment instrument for use in dementia (13), The Pain Assessment in Advanced Dementia Scale (14), and the Pain Assessment Checklist for Seniors with Limited Ability to Communicate (PACSLAC) (15) are some of the scales that are developed based on the indicators of AGS to help with better pain assessment and management in patients with limited communication skills. However, none of these scales have been tested for validity and reliability in Turkish.

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Consisting of 60 items, the PACSLAC comprehensively covers all the important assessment domains as instructed by the AGS (16,17). Having good interrater and test–retest reliability, as well as good internal consistency, the PACSLAC is capable of discriminating painful conditions from nonpainful ones (15,18,19), which makes this scale one of the most useful clinical scales (20) and one of the best psychometrical instruments (20,21). To compare key instruments, Lints-Martindale et al. (18) conducted a study which showed that the PACSLAC had superiority over other scales in detecting and discriminating pain from nonpain-related conditions (19).

The PACSLAC could be a helpful and easy-to-use method for health professionals and improve pain management in older people with limited communication skills in Turkey. Hence, the purpose of this study is to evaluate validity and reliability of the Turkish version of PACSLAC (PACSLAC-T).

## 2. Materials and methods

### 2.1. Participants

A total of 112 older adults staying at a hospital or a long-term care facility in the province of Kırşehir between October 2015 and March 2017 were invited to participate in the study through their legal representatives. The inclusion criteria were: (i) being older than 65 years, (ii) being diagnosed with dementia according to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) criteria (22), (iii) not being subjected to any environmental change, (iv) lacking the ability to express pain and discomfort, and (v) the consent of the legal representatives to participate in the study. Individuals with an acute mental illness, those who had an urgent change in their analgesic treatment after being enrolled in the study, or whose legal representatives rejected to participate in the study were excluded. In accordance with the guidelines approved by the ethics committee of Ahi Evran University, School of Medicine, and the Declaration of Helsinki, each participant's legal representative provided written informed consent.

At the beginning of the study, age, sex, length of stay at the hospital or the long-term care facility, medical diagnoses, medications used, presence of paralysis, spasticity and contracture, and detailed medical history of each patient were recorded.

### 2.2. Instruments

All evaluations including Mini Mental Status Exam (MMSE), Cornell Dementia Depression Scale (CDDS), Global Deterioration Scale (GDS), visual analogue scale (VAS), and PACSLAC-T were performed at the bedside of the patients by trained nurses (TNs) who had previous experience in validity and reliability studies. These nurses were trained by the researchers on how to apply the

scales used in the present study. This training consisted of two phases. The first phase, which was a two-hour-long theoretical training, was followed by the second phase in which the application of the scales was practically explained on 5 individuals that were not included in the study. Prior to the evaluations, the patients were observed for about 5 min by the researchers and TNs. All evaluations were completed between 0900 and 1200 hours to avoid being affected by diurnal changes. PACSLAC-T was administered twice by the TNs at intervals of 2 weeks and the results were recorded.

### 2.2.1 Mini Mental Status Examination

Including 7 main areas of cognitive functioning — orientation to time, orientation to place, registration, attention and calculation, recall, language, and visual construction— MMSE is a screening test for cognitive impairment and is scored between 0 and 30 (23). While lower scores stand for poor level of cognition, higher scores indicate a better cognitive level. Validity of the Turkish version of MMSE was shown in previous studies (24).

### 2.2.2. Cornell Dementia Depression Scale

Participants' depression was assessed using CDDS. Any score ≥ 8 was defined as depression (25). Validity and reliability of the Turkish version of CDDS was demonstrated by Amuk et al. (26).

### 2.2.3. Global Deterioration Scale

It is one of the two most commonly used global staging scales and was developed in 1982 by Reisberg et al. (27). The scale questions the clinical status and mental capacity of the patients and categorizes their dementia into seven stages (27).

### 2.2.4. Visual analogue scale

A VAS was used to assess pain level of the patients by the TNs who were taking daily care of them. During the assessment, the TNs were asked to mark a point between 0 (no pain) and 10 (very severe pain) on VAS by thinking about the pain felt by the patient being evaluated (14).

### 2.2.5. Pain assessment checklist for seniors with limited ability to communicate

PACSLAC was developed to assess pain by observing pain-related behaviors in patients with dementia (15). It includes 60 items and 4 subscales: facial expressions (13 items), activity/body movements (20 items), social/personality mood (12 items), and other, including physiological changes and specific vocalization of pain (15 items). Previous studies demonstrated validity and reliability of the original PACSLAC scale (19,28,29). A cut-off score for the Dutch version was above 4 (30).

Following the guidelines prepared by Beaton et al., the cross-cultural adaptation of the PACSLAC was performed (31). Initially, the original scale was translated into Turkish

by two independent translators, who then discussed and resolved the differences. At the second stage, the Turkish version was translated back into English by two other translators who were native English speakers. Later on, a committee consisting of the researchers as well as the translators reviewed the English translations and sent the final version to the authors of the original PACSLAC to check for possible mistakes and potential inconsistencies. After making all the necessary corrections, as the final stage, a meeting was held with all members of the committee to review and confirm the final version of the scale, which was tested on a sample of 30 older adults. The reliability, convergent validity, and criterion-related validity were investigated in this study. As there was no Turkish gold-standard observational scale to evaluate pain in dementia patients, concurrent validity could not be studied.

Since it was important to rate the scale in conditions similar to the clinical settings, the observations were done while the patients were either walking or being transferred with the assistance of the staff. At this point, patients' statuses were standardized and the reliability of the rating was maintained (6). For the patients who were able to ambulate independently, observation started with their first movement to begin walking and ended when they stopped walking and sat on a chair. However, for the patients who were incapable of standing or walking independently, observation began when the staff member started to help them transfer from their bed to a wheelchair. The starting point of the observation was the moment when the staff member touched the patient to enhance the transfer, and the end point of the observation was the moment when the staff removed their hand from the patient at the end of the transfer. The average observation period was 48.6 ± 9.2 s. Medical history and current health status of the participants, as well as their demographic data, were recorded prior to the observations (6).

## 2.3. Statistical analysis

SPSS 21.00 (IBM Corp., Armonk, NY, USA) was used for all analyses. The variables were expressed in terms of mean (X) and standard deviation (SD). Regarding validity and reliability, the psychometric features of PACSLAC-T were evaluated. ICC, which shows the strength of agreement, was calculated to determine test–retest reliability. ICC values were set as fair (<0.40), moderate (0.40–0.59), substantial (0.60–0.79), and excellent (≥0.80). Any value above 0.70 for Cronbach's alpha would represent good internal consistency, which means that all items of the scale measure various aspects of a single construct. In order to evaluate the dimensions of the PACSLAC-T, the main component factor analysis varimax rotation was used. The datasets were analyzed with the Kaiser–Meyer–Olkin (KMO) test for the suitability of the factor analysis. Pearson correlation coefficient was used for evaluating

the strength of the linear relationships (32), as well as estimating convergent and criterion-related validity of PACSLAC-T with other scales. The threshold for statistical significance was set at P < 0.05.

## 3. Results

Out of 112 older adults aged between 65 and 80 years (mean age: 70.12 ± 5.94 years) who participated in the study, 71% (N = 79) was female. Sociodemographic data, VAS, MMST, CDDS and GDS scores of the older adults were shown in Table 1. The sample size of the study was found as sufficient (KMO test: 0.816).

### 3.1. Reliability

The Cronbach's α coefficient for total PACSLAC-T was 0.842 and 0.888 for test and retest, respectively, which indicated substantial internal consistency. The ICC value for test–retest reliability of the scale was 0.713 (95% CI, 0.486–0.843). Item-total correlations for facial expressions, activity-body movement, social-personality mood, and other subscale scores were 0.714, 0.318, 0.674, and 0.513, respectively (Table 2).

### 3.2. Validity

#### 3.2.1. Convergent validity

PACSLAC-T total score did not correlate with CDDS and GDS scores (r = 0.127, P = 0.094 and r = 0.096, P = 0.167). Out of all subscores of PACSLAC-T, only "other" was associated with CDSS (r = 0.221, P = 0.048) (Table 3).

#### 3.2.2. Criterion-related validity

There were significant positive correlations between VAS and PACSLAC-T total score (r = 0.684, P < 0.001), and subscales of it as follows: facial expressions (r = 0.712, P < 0.001), activity-body movement (r = 0.618, P = 0.002), social-personality mood (r = 0.368, P = 0.045), and other (r=0.597, P = 0.003) (Table 3).

#### 3.2.3. Correlations between PACSLAC-T and cognitive status

A negative correlation was found between PACSLAC-T and MMSE scores (r = –0.468, P = 0.016). Facial expressions of PACSLAC-T showed negative correlation with MMSE (r = –0.517, P < 0.001), whereas other subscales did not (Table 3).

#### 3.2.4. Construct validity

The KMO value was found to be 0.816 and the items of PACSLAC-T were found factorial (P < 0.001). During factor analysis, two factors with eigenvalues greater than 1 were extracted and explained variance of 70.21% (Table 4).

## 4. Discussion

In this study, we aimed to develop and examine the PACSLAC-T in older adults with dementia who had limited communication skills. According to the results of this study, PACSLAC-T is a valid and reliable scale that can be used clinically and in researches.

**Table 1.** Sociodemographic characteristics of the participants.

| | X ± SD |
|---|---|
| Age | 70.12 ± 5.94 |
| Sex (female/male) (n (%)) | 79 (71%) / 33 (29%) |
| MMSE | 11.45 ± 2.68 |
| CDSS | 6.1 ± 0.12 |
| GDS | 5.67 ± 1.45 |
| Duration of disease (weeks) | 40.45 ± 10.74 |
| Duration of institutionalization (weeks) | 114.86 ± 23.97 |
| PACSLAC-T<br>Facial expressions<br>Activity-body movement<br>Social-personality mood<br>Other | 6.12 ± 4.18<br>3.12 ± 2.24<br>1.59 ± 1.04<br>0.91 ± 0.42<br>0.45 ± 0.84 |
| Pain (cm) | 5.14 ± 2.71 |
| Type of Dementia   (n (%))<br>Alzheimer's disease<br>Vascular dementia<br>Lewy body dementia<br>Frontotemporal dementia | <br>54 (48.2%)<br>30 (26.8%)<br>16 (14.3%)<br>12 (10.7%) |

*MMSE, Mini Mental State Examination; CDSS, Cornell Dementia Depression Scale; GDS, Global Deterioration Scale; PACSLAC-T, Turkish version of Pain Assessment Checklist for Seniors with Limited Ability to Communicate.

The test–retest reliability of the PACSLAC-T was found to be substantial (ICC: 0.713). Due to the study design, the result of test–retest reliability of the original version of PACSLAC was not reported (15). In line with our results, the ICC score in the Japanese (ICC: 0.600) and Brazilian (ICC: 0.643) versions was observed to be substantial (6,33).

Previous studies showed that PACSLAC has sufficient internal consistency scores reliability (6,15,28,33,34). In the original PACSLAC study, the Cronbach's α value was 0.92, while in other published versions of the scale it was shown to vary between 0.827 and 0.917. In the Turkish version of PACSLAC, acceptable Cronbach's α value and internal consistency scores were found in accordance with the literature.

In the original version of PACSLAC, a present functioning questionnaire was used to test the cognitive status of the cases and a significant correlation between cognitive status and PACSLAC score was reported. Working on the Japanese version of the scale, Takai et al. found significant correlation between MMSE and PACSLAC total score and facial expression, whereas no correlation was reported between MMSE and activity-body movement, social-personality mood, and other subscales of the PACSLAC (6). Similar to the Japanese version, there was a significant relationship between MMSE and total PACSLAC and facial expression in the PACSLAC-T, whereas no correlation was found between other subscales and MMSE (6). That is why observational pain scales such as PACSLAC should be used with caution in older adults with different cognitive status. In addition, previous studies have reported that older dementia patients respond more strongly to pain when compared to cognitively healthy older individuals. This response is thought to be due to reduced participation in social activities as a result of cognitive impairment.

Progression of dementia was followed using the Gottfries-Bråne-Steen scale in the Japanese version of PACSLAC, and no correlation was found between the total PACSLAC score and the Gottfries-Bråne-Steen scale (6). In line with this, there was no significant relationship between GDS score and both total and subscale scores of PACSLAC-T in our study. In addition, there was a significant correlation between CDDS and the other subscale of PACSLAC-T. The other subscale of PACSLAC-T is associated with pain as well as psychiatric consequences of dementia. As reported in a previous study, it is very difficult to distinguish between pain-related behaviors and

**Table 2.** Test–retest reliability and item-total correlations of the PACSLAC-T.

| | r | ICC | 95% CI | |
|---|---|---|---|---|
| | | | Lower | Upper |
| Facial expressions | 0.714 | 0.843 | 0.797 | 0.889 |
| Activity-body movement | 0.318 | 0.486 | 0.346 | 0.626 |
| Social-personality mood | 0.674 | 0.791 | 0.725 | 0.857 |
| Other | 0.513 | 0.714 | 0.616 | 0.812 |
| Total | | 0.713 | 0.621 | 0.796 |

* PACSLAC-T, Turkish version of Pain Assessment Checklist for Seniors with Limited Ability to Communicate. ICC, intraclass correlation coefficient; CI, confidence interval.

**Table 3.** Correlations between the total and subscale scores of the PACSLAC-T and VAS, MMSE, CDDS, and GDS.

|  | MMSE | | VAS | | CDDS | | GDS | |
|---|---|---|---|---|---|---|---|---|
|  | r | P | r | P | r | P | r | P |
| PACSLAC-T Total | −0.468 | 0.016 | 0.684 | <0.001 | 0.127 | 0.094 | 0.096 | 0.167 |
| Facial expressions | −0.517 | <0.001 | 0.712 | <0.001 | 0.209 | 0.085 | 0.148 | 0.107 |
| Activity/body movement | 0.047 | 0.394 | 0.618 | 0.002 | 0.267 | 0.149 | 0.056 | 0.641 |
| Social/personality mood | 0.002 | 0.712 | 0.368 | 0.045 | 0.126 | 0.247 | 0.118 | 0.099 |
| Other | 0.095 | 0.099 | 0.859 | 0.003 | 0.221 | 0.048 | 0.195 | 0.081 |

* PACSLAC-T, Turkish version of Pain Assessment Checklist for Seniors with Limited Ability to Communicate; VAS, visual analogue scale; MMSE, Mini Mental State Examination; CDDS, Cornell Dementia Depression Scale; GDS, Global Deterioration Scale.

**Table 4.** Varimax rotated two-factor solution of PACSLAC-T scale.

| PACSLAC-T | Factor 1 | Factor 2 |
|---|---|---|
| Facial expressions | 0.826 | −0.125 |
| Activity-body movement | 0.463 | 0.639 |
| Social-personality mood | −0.024 | 0.813 |
| Other | 0.627 | 0.318 |
| Eigenvalues | 2.06 | 1.38 |
| % of variance explained | 44.55 | 20.36 |
| % of variance cumulative | 44.55 | 70.21 |

*PACSLAC-T, Turkish version of Pain Assessment Checklist for Seniors with Limited Ability to Communicate.

psychological activities in older adults with dementia (35). Therefore, pain assessment in individuals who cannot explain their pain due to communication problems should be done with caution (6).

Gazoni et al. used a VAS for criterion-related validity in the Brazilian version of the PACSLAC and found correlation coefficients ranging from 0.386 to 0.643 between VAS and PACSLAC scores (33). In accordance with this study, we found a significant positive correlation between the VAS and both total score of PACSLAC-T and its subscales.

In our study, PACSLAC-T was applied in a hospital and a long-term care center. Hence, future studies are needed to assess the effectiveness of PACSLAC-T in patients with dementia living at home with a caregiver. This could be considered as one of the limitations of the present study. Unfortunately, as there is no observational scale in Turkish to assess pain in individuals with limited communication skills, the concurrent validity of the Turkish version of PACSLAC could not be assessed.

In conclusion, PACSLAC-T is a helpful tool to evaluate pain in older adults with limited communication skills. This fast and user-friendly scale helps healthcare professionals provide improving care management for older adults with dementia suffering pain.

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