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Turkish Adaptation of the Palliative Care and Rapid Emergency Screening (P-CaRES) Tool: A Validity and Reliability Study

Nursah Basol

nursah.basol@yalova.edu.tr

Yalova University

Arda Uzunoglu

Yalova University

Obaidullah Ahmadzai

Yalova Training and Research Hospital

Busra Demirci

Yalova Training and Research Hospital

Research Article

Keywords: Palliative Care, Emergency Department, P-CaRES, Screening Tool, Validation, Sensitivity and Specificity

Posted Date: November 23rd, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11611795/v1

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Additional Declarations: No competing interests reported.

Turkish Adaptation of the Palliative Care and Rapid Emergency Screening (P-CaRES) Tool: A Validity and Reliability Study

Running title: Turkish P-CaRES validity and reliability Study

Nursah Basol, MD[1]; Arda Uzunoglu, PhD[2]; Obaidullah Ahmadzai, MD[3]; Busra Demirci, MD[3]

[1] Yalova University, Faculty of Medicine, Department of Emergency Medicine, Yalova, Türkiye
[2] Yalova University, Faculty of Medicine, Department of Biostatistics and Medical Informatics, Yalova, Türkiye
[3] Yalova Training and Research Hospital, Department of Emergency Medicine, Yalova, Türkiye

Author e-mail addresses: Nursah Basol, nursah.basol@yalova.edu.tr; Arda Uzunoglu, arda-uzunoglu@hotmail.com; Obaidullah Ahmadzai, ahmadzai500@hotmail.com; Busra Demirci, bsrdemirci@gmail.com.

Corresponding author: Nursah Basol, MD
Yalova University, Faculty of Medicine, Department of Emergency Medicine, Yalova, Türkiye
E-mail: nursah.basol@yalova.edu.tr
Adress: Yalova university Main campus, Cinarcik Road, Yalova
Tel: 0226 815 50 00

Presentations: None.

Financial support: None.

Author contributions:
Study concept and design: NB, BD.
Acquisition of the data: AU, OA.
Analysis and interpretation of the data: AU, NB.
Drafting of the manuscript: NB, AU.
Critical revision of the manuscript for important intellectual content: OA, BD.
Statistical expertise: AU.
Acquisition of funding: None

Conflict of interest disclosure: NB, AU, OA, and BD report no conflict of interest.

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Abstract

Introduction: Emergency departments (EDs) are increasingly serving as a primary gateway for patients with advanced, life-limiting chronic diseases. However, rapid identification of palliative care (PC) patients and their unmet needs in overcrowded acute care settings remain a major challenge. This study aimed to perform for the first time the cross-cultural adaptation, diagnostic validation, and reliability assessment of the Palliative Care and Rapid Emergency Screening (P-CaRES) tool in a Turkish ED setting.

Methods: This was a single-center, prospective methodological study involving 246 adult patients presenting to a tertiary ED in Türkiye. The Turkish version was subsequently evaluated for validity and reliability in the clinical study population. Agreement between P-CaRES and the Turkish-validated Supportive and Palliative Care Indicators Tool (SPICT-TR), as well as inter-rater reliability between two independent clinical raters, was evaluated using Cohen's kappa (κ) coefficient.

Results: Overall, 91.1% (n = 224) of screened patients were classified as having a "palliative care need PRESENT". Against the gold standard reference, the Turkish P-CaRES demonstrated an exceptional overall diagnostic accuracy of 96.34% (95% CI: 93.17–98.31%) and substantial criterion validity ($\kappa = 0.780$, $p < 0.001$). The instrument achieved a high sensitivity of 98.21% (95% CI: 95.47–99.51%), a specificity of 78.26% (95% CI: 56.30–92.54%). Inter-rater

agreement between independent clinical raters was moderate ($\kappa = 0.556$, $p < 0.001$), while concordance with SPICT-TR was fair ($\kappa = 0.389$, $p < 0.001$).

Conclusion: The Turkish adaptation of P-CaRES is a brief, highly sensitive, and operationally feasible screening tool that accurately identifies patients with unmet palliative care needs in ED. Considering that there is no common tool or instrument for identifying PC patients and their needs in Turkish EDs, routine implementation of P-CaRES*TR may enable rapid bedside identification, facilitates timely PC consultations, and supports optimal clinical decision-making in acute emergency practice.

Keywords: Palliative Care; Emergency Department; P-CaRES; Screening Tool; Validation; Sensitivity and Specificity.

Turkish Adaptation of the Palliative Care and Rapid Emergency Screening (P-CaRES) Tool: A Validity and Reliability Study

Introduction

Emergency Departments (EDs) are an integral part of the organization and delivery of Palliative Care (PC) [1, 2]. EDs play a crucial role due to an aging population and the increasing prevalence of advanced, life-limiting chronic diseases, serving as a bridging gateway to appropriate PC services [3–5]. Furthermore, EDs frequently serve as the first point of contact for patients who could benefit from a palliative approach, presenting a vital clinical opportunity for the early recognition of unmet palliative care needs [1, 6].

Fundamentally, palliative care and emergency care operate under distinct clinical paradigms [7, 8]. While PC focuses on symptom management, functional preservation, and promoting quality of life through patient-centered goals of care, standard emergency practice prioritizes rapid stabilization, identifying underlying acute pathology, and initiating intensive diagnostic or therapeutic interventions [2, 7]. The integration of PC into ED practice promotes patient-centered care by aligning medical interventions with individual patient preferences, avoiding non-beneficial invasive treatments when appropriate [7, 9]. Early initiation of PC in the ED improves symptom management, enhances patient and family satisfaction, facilitates timely referrals to hospice or outpatient services, and significantly reduces hospital length of stay (LOS), intensive care unit (ICU) utilization, and overall healthcare costs [8, 10–12]. In addition, early PC engagement improves emergency physicians' awareness of end-of-life decision-making and enhances family preparedness for disease progression [8, 13].

As of October 2023, a total of 437 palliative care centers with a combined bed capacity of 6,397 were reported across Türkiye [14, 15]. According to official data published by the Ministry of

Health, more than 90,000 patients received inpatient PC services at these centers during the first six months of 2023 [14, 15]. Despite this substantial expansion in dedicated bed capacity, public and provider awareness regarding palliative care options remains limited [13, 16]. Furthermore, emergency physicians face persistent operational challenges in systematically identifying patients with advanced illnesses and evaluating their unmet palliative care needs in overcrowded acute care environments [13, 17].

The Palliative Care and Rapid Emergency Screening (P-CaRES) tool is a brief, content-validated screening instrument developed to improve access to PC among ED patients with life-limiting advanced illnesses by facilitating timely inpatient consultations [1, 18]. The instrument utilizes a two-stage screening approach that combines the identification of advanced or potentially life-limiting clinical conditions (Stage1) with a structured assessment of potential unmet palliative needs (Stage2) [18, 19]. Unlike traditional oncology-centric screening protocols, P-CaRES encompasses both malignancy-related conditions and a broad range of non-malignant conditions, including chronic obstructive pulmonary disease (COPD), advanced dementia, New York Heart Association (NYHA) class IV heart failure, end-stage renal disease (ESRD), end-stage liver disease (ESLD), stroke, and septic shock [18, 20]. The positive screening threshold can be calibrated (e.g., requiring ≥1 vs. ≥2 unmet needs) to balance sensitivity (93.2%–98.0%) and specificity (51.4%–71.8%) according to institutional PC consultation capacity [20, 21]. Such a standardized approach supports the systematic identification of vulnerable patients and facilitates seamless integration of PC into routine emergency workflows [1, 21, 22].

To the best of our knowledge, there is currently no validated screening tool to identify PC patients and their unmet needs in EDs in Türkiye. Moreover, no prior study has cross-culturally adapted or evaluated the P-CaRES tool in this setting [8, 13, 16]. Therefore, this study aimed to

evaluate the applicability of the P-CaRES tool in a Turkish ED setting to enable early identification and facilitate timely referral to appropriate PC services.

Methods

Ethical Approval and Permissions

The Turkish translation and cultural adaptation of the P-CaRES were performed by our research team. Ethical approval for the study was obtained from the Yalova University, Medical Research Ethics Committee (Date: 02.04.2026; Decision No: TIPF-FRM-028-04). Participants were informed about the study, and written informed consent was obtained. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Study Design and Sample

This was a single-center, prospective methodological study conducted to evaluate the validity and reliability of the Turkish version of the Palliative Care and Rapid Emergency Screening (P-CaRES) tool. The study was conducted between April 5, 2026, and September 1, 2026 at the Emergency Department of Yalova Training and Research Hospital. Patients were eligible if they were aged ≥18 years, had a chronic and/or progressive life-limiting condition (e.g., malignancy, advanced heart failure, chronic obstructive pulmonary disease, chronic kidney disease, advanced dementia, or Alzheimer's disease), had a caregiver available who could provide information regarding their clinical condition, were able to participate in the data collection process, and provided informed consent either personally or through a legally authorized representative. Patients presenting with acute trauma, cardiac or respiratory arrest, or other conditions requiring immediate resuscitation were excluded. Patients with cognitive impairment who had no legal representative or caregiver, those who did not provide informed consent, and those with severe language or sensory impairments preventing adequate communication were also excluded.

A total of 246 adult patients were included in the study. Demographic and clinical data, including age, sex, comorbidities, and ED disposition (intensive care unit admission, hospital ward admission, or discharge), were recorded. The Turkish P-CaRES and SPICT tools were administered to each participant, and PC needs were independently assessed by two emergency medicine specialists, with additional specialty-based adjudication in cases of disagreement. Face validity was assessed by 33 ED physicians.

The sample size was calculated using PASS 2008 software, based on previous studies, with a 95% confidence level and 80% statistical power. The minimum required sample size was 44 patients, and 246 patients were included in the study.

Data Collection Tools

Palliative Care and Rapid Emergency Screening (P-CaRES) Tool: The P-CaRES is a brief, two-part screening tool developed by George et al. [18] to rapidly identify emergency department patients with palliative care needs. Stage 1 assesses the presence of advanced life-limiting illnesses (advanced dementia or central nervous system disease, advanced cancer, renal failure, advanced COPD, advanced heart failure, end-stage liver disease and septic shock). If no item is checked in this part, screening is terminated (STOP); if at least one item is checked, the assessment proceeds to Part 2 (CONTINUE). Stage 2 assesses five patient-specific unmet palliative care needs: frequent emergency department visits or hospital admissions, uncontrolled symptoms, functional decline, uncertainty about goals of care and/or caregiver distress, and the "surprise question". When two or more items are checked in this part, a palliative care consultation is recommended, and the patient is classified as having a "palliative care need PRESENT" [23].

Supportive and Palliative Care Indicators Tool (SPICT): The SPICT, developed at the University of Edinburgh in 2010, is a two-part assessment tool that examines general indicators of deteriorating health and clinical indicators specific to the underlying illness [24]. The validated Turkish version of the SPICT (SPICT-TR) was used in this study [25]. Because the original SPICT is a clinical decision-support tool without a fixed cut-off, classification was based on the threshold defined in validation studies of hospitalized patients and also used in the SPICT-TR validation study [25, 26]. Accordingly, patients with at least two general indicators (general indicators of deteriorating health) and at least one disease-specific clinical indicator were classified as "palliative care need PRESENT", and all others as "palliative care need ABSENT" [25].

Linguistic and Cultural Adaptation (Forward–Backward Translation)

The Turkish translation and cultural adaptation of the P-CaRES were performed by our research team using the forward translation and back-translation method [27]. The original English P-CaRES form was first translated into Turkish by one expert, and the resulting Turkish form was independently back-translated into English by a different expert. The backtranslation was compared with the original English form to assess the semantic and conceptual equivalence of the items. The back-translated text was then translated into Turkish again by another expert and compared with the first Turkish translation, and the necessary revisions were made. After the translation stages, the Turkish form was evaluated for linguistic, conceptual and cultural equivalence with the original P-CaRES by a five-member expert panel consisting of a palliative care physician, an internal medicine physician, a family medicine specialist and two clinical nurses/allied health professionals. The final version of the Turkish P-CaRES form was produced at the end of this process.

Face Validity

Face validity indicates whether a measurement tool appears to cover the concept it intends to measure. The face validity of the Turkish version of P-CaRES was evaluated by 33 healthcare professionals, including physicians, nurses, and other healthcare personnel, who were potential users of the instrument in clinical practice. The comprehensibility of the form, clarity of the items, applicability and ease of clinical use were examined. Items found difficult to understand were revised, and the final version of the Turkish form was produced.

Criterion Validity: Agreement Between the P-CaRES and the Gold Standard

Two independent clinical raters (Clinical rater 1 and Clinical rater 2) and a palliative care specialist were involved in the assessment of criterion validity. Clinical rater 1 and Clinical rater 2 independently assessed patients' palliative care needs and then reached a joint clinical decision. This decision was reviewed by the palliative care specialist to establish the final clinical decision. The final clinical decision was accepted as the gold standard (reference standard), and the agreement between the P-CaRES and the gold standard was evaluated. The P-CaRES was administered by a researcher other than the clinical raters, and the clinical raters made their decisions blinded to the P-CaRES results.

Diagnostic Validity

Diagnostic validity indicates how accurately a measurement tool classifies individuals with and without the target condition relative to a reference (gold) standard. In this study, to assess criterion validity, the P-CaRES classification (palliative care need present or absent) was compared with the final clinical gold standard. Sensitivity represents the proportion of patients with a palliative care need correctly identified by the P-CaRES, and specificity the proportion of

patients without a palliative care need correctly identified [28]. In addition, positive and negative predictive values, positive and negative likelihood ratios and overall accuracy were calculated.

Agreement Between the P-CaRES and the SPICT

The agreement of the P-CaRES with another palliative care assessment tool, the SPICT, was examined. Based on the classifications of the raters who administered the P-CaRES and the SPICT, the P-CaRES result and the SPICT result were each recorded as “palliative care need PRESENT” or “palliative care need ABSENT”, and the two results were compared. Agreement between the P-CaRES result and the SPICT result was assessed using Cohen's kappa (κ) coefficient [29].

Inter-rater Reliability

Inter-rater reliability was examined by comparing the individual assessments of patients' palliative care needs made by Clinical rater 1 and Clinical rater 2 before the joint clinical decision. Agreement between the two raters was assessed using Cohen's kappa (κ) coefficient [29].

P-CaRES Interim Result and Final Result

Because of the algorithmic structure of the P-CaRES, the interim result of the assessment and the final P-CaRES result were also examined separately. In the first stage, the interim result was recorded as “STOP” or “CONTINUE”; patients with a CONTINUE result proceeded to the second stage, and the P-CaRES result was recorded as “palliative care need PRESENT” or “palliative care need ABSENT”. The distributions of the interim and final P-CaRES results are presented as numbers and percentages (Figure 1). The validity and reliability assessments performed in the study are summarized in Table 1.

Table 1. Validity and reliability assessments performed for the P-CaRES

Assessment	Methods
Linguistic and cultural adaptation	Forward and back-translation; evaluation by a five-member expert panel
Face validity	Assessment of comprehensibility, clarity and applicability by 33 healthcare professionals
Criterion validity	Comparison with the final clinical decision (gold standard); Cohen's kappa (κ) coefficient
Diagnostic validity	Sensitivity, specificity, PPV, NPV, LR+, LR− and accuracy against the final clinical decision (gold standard)
Agreement between P-CaRES and SPICT results	Cohen's kappa (κ) coefficient
Inter-rater reliability	Cohen's kappa (κ) coefficient between Clinical rater 1 and Clinical rater 2

PPV: positive predictive value; NPV: negative predictive value; LR+: positive likelihood ratio; LR−: negative likelihood ratio.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics for Windows, version 27.0 (IBM Corp., Armonk, NY, USA) and MedCalc Statistical Software (x64) (MedCalc Software Ltd, Ostend, Belgium). Categorical variables are presented as numbers (n) and percentages (%). The normality of continuous variables was assessed using the Kolmogorov–Smirnov test, and non-normally distributed continuous variables are presented as median (minimum–maximum). The Mann–Whitney U test was used to compare non-normally distributed continuous variables between

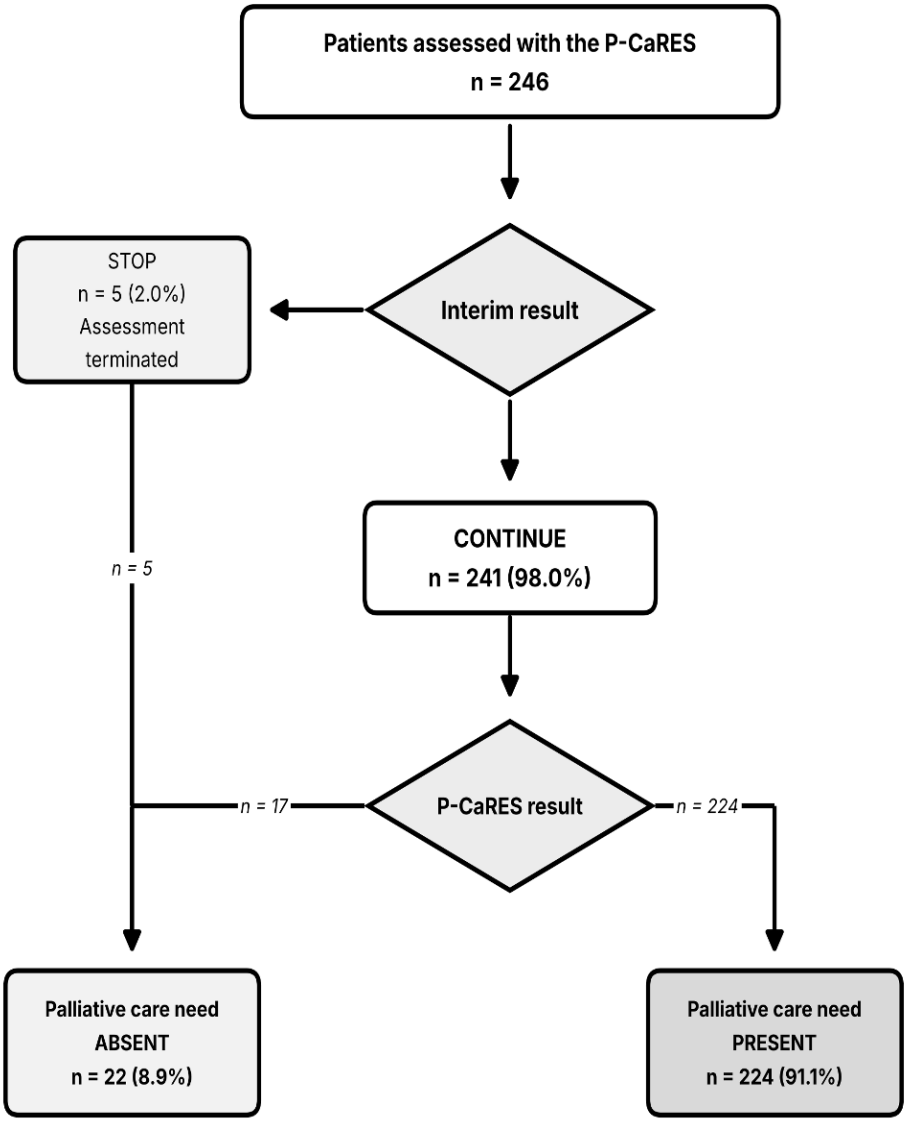
groups. Pearson's chi-square test and Fisher's exact test were used to compare categorical variables. Criterion validity (agreement between the P-CaRES and the gold standard), agreement between the P-CaRES and the SPICT, and reliability between the two independent clinical raters were assessed using Cohen's kappa (κ) coefficient, and kappa values were interpreted according to the Landis and Koch classification [29]. Diagnostic validity was evaluated using the gold standard as the reference. Sensitivity, specificity, positive and negative predictive values (PPV, NPV), positive and negative likelihood ratios (LR+, LR−) and accuracy were calculated with 95% confidence intervals (CIs). Statistical significance was set at $p<0.05$.

Results

Patient Characteristics and P-CaRES Interim and Final Results

A total of 246 patients were included in the study; 146 (59.3%) were female and 100 (40.7%) were male. The interim result was STOP in 5 patients (2.0%) and CONTINUE in 241 patients (98.0%). Among the patients with a CONTINUE interim result, the P-CaRES result was palliative care need ABSENT in 17. Overall, the P-CaRES result was palliative care need ABSENT in 22 patients (8.9%) and palliative care need PRESENT in 224 patients (91.1%) (Figure 1).

Figure 1. Flow diagram of P-CaRES interim and results



There were no statistically significant differences between patients with a P-CaRES result of "palliative care need PRESENT" and "palliative care need ABSENT" in age (median 86.5 [52–99] vs. 86 [62–98] years; p=0.886) or sex distribution (female 58.5% vs. 68.2%; p=0.377) (Table 2).

Table 2. Distribution of age and sex according to the P-CaRES result

Variable		Palliative care need ABSENT (n=22)	Palliative care need PRESENT (n=224)	p
Age (years)	Median (min–max)	86 (62–98)	86.5 (52–99)	0.886[c]
Sex	Female, n (%)	15 (68.2)	131 (58.5)	0.377[a]
	Male, n (%)	7 (31.8)	93 (41.5)	

[a] Pearson's chi-square test; [c] Mann–Whitney U test.

The ICU admission rate was 17.4% in patients with a palliative care need PRESENT and 4.5% in those with a palliative care need ABSENT; the difference was not statistically significant (p=0.220). The ward admission rate was significantly higher in patients with a palliative care need PRESENT (31.3%) than in those with a palliative care need ABSENT (9.1%) (p=0.029). The discharge rate was significantly lower in patients with a palliative care need PRESENT (50.4%) than in those with a palliative care need ABSENT (86.4%) (p=0.001) (Table 3).

Table 3. Distribution of clinical course variables according to the P-CaRES result

Variable		Palliative care need ABSENT (n=22) n (%)	Palliative care need PRESENT (n=224) n (%)	p
ICU admission	No	21 (95.5)	185 (82.6)	0.220[b]
	Yes	1 (4.5)	39 (17.4)	
Ward admission	No	20 (90.9)	154 (68.8)	**0.029**[a]
	Yes	2 (9.1)	70 (31.3)	
Discharge	No	3 (13.6)	111 (49.6)	**0.001**[a]
	Yes	19 (86.4)	113 (50.4)	

[a] Pearson's chi-square test; [b] Fisher's exact test.

Criterion Validity, Agreement with the SPICT and Inter-rater Reliability

Moderate agreement was found between the individual assessments of palliative care needs by Clinical rater 1 and Clinical rater 2 (κ=0.556; p<0.001). Agreement between the P-CaRES result and the final clinical decision accepted as the gold standard was substantial (κ=0.780; p<0.001); the P-CaRES classification matched the final clinical decision in 237 of 246 patients (96.3%) (Table 4). Agreement between the P-CaRES result and the SPICT result was fair but statistically significant (κ=0.389; p<0.001) (Table 5).

Table 4. Cross-tabulation of the P-CaRES classification and the final clinical decision (gold standard) (n=246)

P-CaRES result	Gold standard: PRESENT	Gold standard: ABSENT	Total (P-CaRES)	Cohen's κ	p
Palliative care need PRESENT	219	5	224 (91.1%)	0.780	**<0.001**
Palliative care need ABSENT	4	18	22 (8.9%)		
Total (gold standard)	223 (90.7%)	23 (9.3%)	246 (100%)		

Cells show frequencies (n). Percentages in the total column and row are calculated relative to the entire sample (n=246).

Table 5. Agreement among the P-CaRES result, the final clinical decision (gold standard), the SPICT result, Clinical rater 1 and Clinical rater 2

Comparison	Cohen's κ	p
Clinical rater 1 – Clinical rater 2	0.556	**<0.001**
P-CaRES result – Final clinical decision (gold standard)	0.780	**<0.001**
P-CaRES result – SPICT result	0.389	**<0.001**

Gold standard: *the final clinical decision established by the palliative care specialist's review of the joint clinical decision of Clinical rater 1 and Clinical rater 2.*

Diagnostic Validity

According to the final clinical decision (gold standard), 223 of the 246 patients had a palliative care need PRESENT and 23 had a palliative care need ABSENT. The P-CaRES correctly identified 219 of these patients (sensitivity 98.21%; 95% CI: 95.47–99.51) and correctly classified 18 of the 23 patients without a palliative care need (specificity 78.26%; 95% CI: 56.30–92.54). The positive predictive value was 97.77% (95% CI: 95.28–98.96), the negative predictive value 81.82% (95% CI: 62.46–92.41), the positive likelihood ratio 4.52 (95% CI: 2.08–9.81), the negative likelihood ratio 0.023 (95% CI: 0.008–0.062) and the overall accuracy 96.34% (95% CI: 93.17–98.31) (Table 6). The high sensitivity and very low negative likelihood ratio indicate that the P-CaRES is unlikely to miss patients with palliative care needs.

Table 6. Diagnostic validity of the P-CaRES against the final clinical decision (gold standard)

Measure	Value	95% Confidence interval
Sensitivity	98.21%	95.47–99.51
Specificity	78.26%	56.30–92.54
Positive predictive value (PPV)	97.77%	95.28–98.96
Negative predictive value (NPV)	81.82%	62.46–92.41
Positive likelihood ratio (LR+)	4.52	2.08–9.81
Negative likelihood ratio (LR−)	0.023	0.008–0.062
Accuracy	96.34%	93.17–98.31

Discussion

This study represents the first cross-cultural adaptation, diagnostic validation, and reliability assessment of the Palliative Care and Rapid Emergency Screening (P-CaRES) tool [18, 20] in a Turkish ED setting [1, 13]. Our primary finding demonstrates that the Turkish adaptation of P-CaRES (P-CaRES*TR) possesses exceptional diagnostic accuracy and substantial criterion validity when evaluated against an independent, blinded PC specialist review as the reference gold standard. Specifically, the tool achieved a remarkably high sensitivity and positive predictive value (PPV), alongside a moderate specificity and negative predictive value (NPV). Furthermore, the positive likelihood ratio and the extremely low negative likelihood ratio confirm that P-CaRES is an exceptionally robust screening instrument that minimizes the risk of

false-negative classifications, ensuring that seriously ill patients with unmet PC needs are not overlooked during acute triage [1, 3, 18].

The high sensitivity observed in our Turkish cohort (98.21%) is consistent with the findings of the foundational pre-implementation study by Bowman et al. [20], which reported sensitivities of 98.0% and 93.2% using thresholds of ≥1 and ≥2 unmet palliative care needs, respectively, along with an overall expert concordance of 88.7% among emergency department providers across multiple centers in the United States. [20]. However, some differences in diagnostic performance were observed when our findings were compared with those reported in recent international studies from Germany [23], Malaysia [30], and Portugal [31].

In contrast to the high sensitivity observed in our study (98.21%), the German validation study [23] reported sensitivities of 64.0% and 64.7% when compared with expert assessment and SPICT, respectively, whereas the Malaysian pilot study [30] reported a sensitivity of 33.3% [23,30]. This variance can be attributed to differences in clinical sampling and local ED workflows. While the Malaysian study [30] evaluated a smaller, highly selected cohort of hospitalized older adults (mean age 71.7 years, n=40), our study evaluated a broader acute presentation cohort (n=246) with a high underlying prevalence of advanced chronic disease, reflecting the acute gateway role of Turkish EDs [1, 8, 13]. Besides, it may be a good indicator of increased awareness on PC patients in ED due to having active PC service in our hospital.

Clinical validation studies in Germany [23] (specificity 90.8%–96.8%) and Malaysia [30] (specificity 93.8%) emphasized high specificity as a mechanism to prevent specialist consultation overload. In our Turkish setting, the specificity observed in our study mirrors the vignette-based specificity (71.8%) reported in the original American derivation studies by Bowman et al. [20]. In crowded ED settings, particularly in our hospital where outpatient

palliative care services are limited, prioritizing a higher sensitivity is clinically important to ensure that as many patients with palliative care needs as possible are identified and not overlooked [13, 16].

The Portuguese adaptation [31] demonstrated excellent content validity (CVI = 0.97) and strong face validity. Similarly, our expert panel and evaluations involving 33 healthcare professionals supported the cultural appropriateness and clarity of the Turkish version, while preserving the original two-part, 13-item structure of P-CaRES.[18, 31].

A noteworthy finding in our investigation is the fair diagnostic agreement between P-CaRES and the Turkish-validated SPICT (SPICT-TR) [25]. This moderate concordance underscores fundamental operational and conceptual differences between the two instruments. P-CaRES [18, 20] was designed specifically for rapid execution in fast-paced ED environments, utilizing a strict two-stage algorithmic cut-off (Stage 1 disease criteria + Stage 2 unmet PC needs). In contrast, SPICT [24, 32] functions as an extensive clinical proforma designed for primary care, outpatient clinics, and inpatient wards to catalyse longitudinal Advance Care Planning (ACP) discussions. As noted by Mahura et al. [32] in their global scoping review of SPICT, while SPICT [24, 32] excels in facilitating structured ACP documentation and goals-of-care dialogues over time, its multi-item checklist design lacks fixed, time-sensitive referral thresholds tailored to acute triage. Consequently, P-CaRES [18, 20] provides a more decisive, actionable binary output for emergency physicians managing acute crises.

Our analysis revealed statistically significant correlations between positive P-CaRES screening and acute clinical disposition. Patients classified as 'palliative care need PRESENT' exhibited significantly higher ward admission rates and markedly lower discharge rates compared to those classified as 'palliative care need ABSENT'. Intensive care unit admission rates were also higher

in the need PRESENT group, though this difference did not reach statistical significance. These findings are consistent with previous international studies. A German study [6] found that 15.9% of adult medical emergency department visits screened positive for unmet palliative care needs, with more than 43% of these patients subsequently admitted to hospital wards. Similarly, a US study [19] reported significantly higher hospital admission rates among older patients who screened positive on P-CaRES compared with those who screened negative (79% vs. 24%). Similarly, a Malaysian study [30] reported that patients with positive P-CaRES screening results had an 8.6-fold higher risk of mortality at three months than those with negative results (55.6% vs. 6.5%).

Collectively, these data confirm that P-CaRES effectively flags a highly vulnerable, high-acuity patient population at high risk of prolonged hospitalization, intensive resource utilization, and short-term mortality [5, 6, 19, 30].

Regarding inter-rater reliability, agreement between the two independent clinical raters prior to joint specialist review demonstrated moderate concordance. This reflects inherent variability in routine ED clinical assessments when evaluating subjective items such as 'caregiver distress' or the 'surprise question.' As highlighted in previous implementation trials [18, 20, 33], providing brief, standardized clinician training on goals-of-care identification and symptom distress scoring further stabilizes inter-rater agreement across resident and attending physicians.

Limitations

First, this study was conducted at a single tertiary urban center, which may limit immediate generalizability to rural or primary-level EDs. Second, long-term survival outcomes (e.g., 6-month or 1-year post-discharge mortality) were not prospectively tracked in this initial validation phase.

Conclusion

In conclusion, the Turkish adaptation of the P-CaRES instrument demonstrates high diagnostic accuracy, excellent sensitivity, and clinical feasibility for identifying PC patients and their needs in ED settings. With an overall diagnostic accuracy of 96.34% and a sensitivity of 98.21%, P-CaRES*TR offers a promising approach to bridging the gap between emergency medicine and palliative care by facilitating the early identification of patients with unmet PC needs. Given the lack of a standardized instrument for identifying patients requiring PC and assessing their needs in Turkish EDs, routine implementation of P-CaRES*TR may support timely PC consultations, more informed goals-of-care discussions, and appropriate clinical decision-making while minimizing unnecessary invasive interventions and avoiding additional operational burden.

Acknowledgements

We thank all members of the research group for their contributions to the fieldwork and laboratory analysis. During the preparation of this article, the authors used Editgpt (v1.0.31), Gemini (3.7 Flash) and Claude (Anthropic, PBC) to make grammatical, spelling, punctuation, and sentence structure corrections without altering the scientific content or original ideas of the article. Artificial intelligence was not used for research planning, data acquisition and analysis, or interpretation.

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