Turkish Validity and Reliability Study on the Information Needs in Percutaneous Coronary Artery Intervention Scale (NCPI-10-TR)

Perkütan Koroner Arter Girişiminde Bilgi Gereksinimleri Ölçeği'nin (NCPI-10-TR) Türkçe Geçerlilik ve Güvenirlik Çalışması

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ABSTRACT

Objective: The objective of this study was twofold: firstly, to adapt the Information Needs Scale for Percutaneous Coronary Artery Intervention into Turkish, and secondly, to test the validity and reliability of the scale.

Materials and Methods: This methodological study was conducted with 200 patients who were admitted to the angiography unit of a university hospital between August 1, 2021 and February 28, 2022. Data were collected using the "Patient Questionnaire Form" and the Turkish version of the "Percutaneous Coronary Intervention Information Needs Scale".

Results: In order to ascertain the internal consistency structure of the Turkish form of the scale, the item-total score correlation was examined. It was found that the Cronbach alpha internal consistency coefficient of the scales was 0.98 for the importance level of the need to be informed and 0.98 for the degree of fulfilment. The item-total score correlation values of the scale ranged from 0.75 to 0.92 for the importance level and from 0.78 to 0.95 for the degree of fulfilment. According to the Guttman Split-Half Coefficient, the correlation value between the two half-item means was found to be 0.930, and the Guttman Split-Half Coefficient was found to be 0.957.

Conclusions: It was ascertained that the Turkish iteration of the Percutaneous Coronary Artery Intervention Information Needs Scale (NCPI-10-TR) possesses adequate validity and reliability indicators in determining information needs in percutaneous coronary intervention, as determined by the degree of importance attributed to information requirements and the degree to which these requirements are met in coronary artery patients.

Keywords: Coronary artery disease, information needs, percutaneous coronary artery intervention, reliability, validity

ÖZ

Amaç: Bu çalışma iki temel amaçla yürütülmüştür. İlk olarak, Perkütan Koroner Arter Girişimi için Bilgi İhtiyaçları Ölçeği Türkçe'ye uyarlanmıştır. İkinci olarak, uyarlanan ölçeğin geçerliliği ve güvenilirliği test edilmiştir.

Materyal ve Metot: Metodolojik türde olan çalışma, 1 Ağustos 2021-28 Şubat 2022 tarihleri arasında bir üniversitesi hastanesinin anjiyografi ünitesine başvuran ve araştırmaya katılmada gönüllü olan 200 hasta ile yapıldı. Araştırmanın verileri "Hasta Anket Formu" ve "Perkütan Koroner Arter Girişiminde Bilgi Gereksinimleri Ölçeği'nin" Türkçe formu kullanılarak yüz yüze toplandı.

Bulgular: Ölçeğin Türkçe formunun iç tutarlılık yapısı için madde toplam puan korelasyonu, Ölçeklerin, Cronbach alpha iç tutarlık katsayısı bilgilendirilme ihtiyacının önem derecesine 0,98, yerine getirilme derecesine göre ise 0,98 olarak bulundu. Ölçeğin, önem derecesine göre madde-toplam puan korelasyon değerleri 0,75 ile 0,92 arasında, yerine getirilme derecesine göre ise 0,78 ile 0,95 arasındadır. Guttman Split-Half Katsayısına göre ise, iki yarı madde ortalamaları arasındaki korelasyon değeri 0,930, Guttman Split-half coefficient 0,957 olarak bulundu.

Sonuç: Perkütan Koroner Arter Girişim Bilgi Gereksinimi Ölçeği'nin (NCPI-10-TR) Türkçe versiyonunun, koroner arter hastalarında bilgi gereksinimine verilen önem derecesi ve bu gereksinimlerin karşılanma derecesi ile perkütan koroner girişimlerde bilgi gereksinimini belirlemede yeterli geçerlilik ve güvenirlilik göstergelerine sahip olduğu saptanmıştır.

Anahtar Kelimeler: Bilgi gereksinimi, koroner arter hastalığı, geçerlilik, güvenilirlik, perkütan koroner arter girişim

INTRODUCTION

Cardiovascular diseases rank first among all global causes of death. It is estimated that there will be over 22.2 million deaths annually by 2030.[1,2] Advances in pharmacological treatments and revascularization techniques have contributed to better monitoring and management of cardiac patients. Percutaneous coronary intervention (PCI) is one of the most frequently performed procedures in cardiovascular medicine.[3,4] PCI is well-established as a life-saving procedure. However, due to mobility restrictions and the nature of the PCI technique itself, various complications may arise post-procedure. Common problems include respiratory distress, clotting disorders, rib fractures, pain, catheter infections, and reduced renal blood flow. Additionally, psychosocial challenges like career disruptions, social isolation, and non-cardiac mental health conditions such as anxiety, depression, hopelessness, and sexual dysfunction may also occur.[5] This makes it important to address the comprehensive needs of cardiac patients.

Providing patients with information about their condition, treatment options, and necessary interventions enables them to make informed decisions about their healthcare.[6] Research has shown that educating cardiac patients prior to PCI significantly reduces their levels of anxiety and depression before, process and after the procedure.[7,8] Therefore, understanding the perspectives of cardiac patients regarding their informational needs is critical. Knowledge refers to what patients need to know from their healthcare professionals for effective management of their condition, an approach that is associated with improved long-term clinical outcomes and higher patient satisfaction with care.[9] It is essential to offer tailored education and support to patients during both the pre- and post-procedure phases of PCI, ensuring their informational needs are fully met.[10] A key aspect of patient education is customizing the content to the specific needs and characteristics of each patient, which is particularly crucial for achieving effective discharge education outcomes.[11] While patient and family education is the responsibility of the entire healthcare team during the discharge preparation process, nurses play a central role in discharge planning.[10]

A review of the literature reveals a lack of sufficient research in our country focused on identifying the information needs of patients undergoing PCI. In this context, the Percutaneous Coronary Intervention Information Needs Scale (NCPI-10) was evaluated for its validity and reliability in Türkiye to assess the information needs of PCI patients accurately.

MATERIALS AND METHODS

Ethics Committee Approval: Before you start working, the original creator of the NCPI-10 scale, Maria Polikandrioti, was contacted via email, and permission to use the scale was obtained. Before the study commenced, written approval was secured from the hospital where the research was conducted, and ethics approval was granted by the university's Clinical Research Ethics Committee (Date: 16/08/2021, decision no: HRU/21.14.30). All patients were informed about the study and their consent was obtained. This study was conducted in accordance with the Declaration of Helsinki.

Population and Sampling: In the scale validity and reliability studies, the sample size was stated as five to ten times the total number of questions.[12,13] Therefore, for this study, a minimum sample size of 100 patients was determined, as the NCPI-10 scale contains 10 items. However, given that separate samples are recommended for both exploratory and confirmatory factor analyses in scale validation studies, the final sample size was increased to 200 patients.

Study Instruments: The Percutaneous Coronary Intervention Information Needs Scale (NCPI-10) is a 10-item instrument designed to assess the information needs of patients undergoing PCI. Each question is rated from 'Not at all' to 'Very much' on a four Likert scale. The scale provides two main results: the level of importance assigned to the information needs and the degree to which that need is fulfilled. The score obtained from the scale ranges from 10 to 40, and the higher the score, the higher the perceived importance of information needs or the fulfilment of information needs. Cronbach α coefficient of the original scale is 0.70.[14]

Research Implementation

Language Validity: In order to evaluate the scale in terms of psychometric properties, the researchers translated the NCPI-10 from English into Turkish. Each item was carefully evaluated for linguistic accuracy, meaning, and conceptual alignment with the original. Following this, the scale was back-translated from Turkish to English, and a linguist reviewed the back-translation to ensure clarity and accuracy. To maintain consistency, the researchers cross-referenced the back-translation version with the original English text to ensure that the translated scale retained the same meaning and purpose as the original version.

Content Validity: The Davis technique was applied to determine the content validity index (CVI). Using this method, experts rated each item on a four-point scale: "Completely appropriate," "Appropriate, requires minor revision," "Appropriate, requires major revision," and "Not appropriate, remove." The CVI for each item was calculated by dividing the number of experts who selected either "Completely appropriate" or "Appropriate, requires minor revision" by the

total number of experts. For an item to be considered valid in terms of content, its CVI must be greater than 0.80. If an item's CVI falls below 0.80, it is recommended for removal.[15]

Structural Validity: Exploratory factor analysis (EFA) was used for the construct validity of the NCPI-10 scale. The suitability of the data for factor analysis was evaluated using the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity. The KMO test was used to determine whether the sample was sufficient for a robust factor analysis, while Bartlett's test assessed whether the correlations between variables were sufficient for factor extraction. A KMO value of 0.75 or higher was considered "excellent," whereas a value between 0.4 and 0.75 was classified as "fair to good."

Reliability: Item analysis and Cronbach's α coefficient were used to evaluate the internal consistency of the scale. Due to potential temporal variations in responses, a follow-up test was conducted by phone approximately two weeks after the initial data collection. The Guttman Split-Half method was employed to assess the stability of the NCPI-10 scale items over time. The item-total correlation analysis revealed the correlation levels of individual scale items. Additionally, the correlations between each item and the total score, as well as the mean inter-item correlation coefficient, were calculated to as-

sess the reliability of the scale further.

Statistical Analysis: SPSS version 17 was used for analysis. The Kolmogorov-Smirnov test was used for normality analysis. Descriptive statistics were used for the analysis of variables related to descriptive characteristics. Descriptive data were reported as frequency, percentage, mean±standard deviation. The reliability of the NCPI-10 was assessed by test-retest correlation, item analysis, Cronbach's α and item-total correlation. Statistical significance was based on $p<0.05$ and 95% confidence interval.

RESULTS

According to Table 1, the study included 200 patients with a mean age of 60.41 ± 12.34 years. 54% of the patients were male, 49% were literate, 83.5% were married, 64% were housewives or retired, 83% were unemployed, and 75% had an income lower than their expenses.

In terms of disease characteristics, 73.5% of patients had no chronic disease and 55.5% had undergone percutaneous coronary intervention (PCI) for diagnostic or therapeutic purposes. PCI was performed only once in 42.5% of patients and 32.5% had myocardial infarction (MI) or acute coronary syndrome (ACS). Furthermore, 88% of participants did not experience any complications after PCI (Table 2).

Table 1. Comparison of participants based on socio-demographic characteristics.

Characteristics		n (%)	Characteristics		n (%)
Gender	Male	108 (54.0)	**Marital**	Married	167 (83.5)
	Female	92 (46.0)	**Status**	Single	33 (16.5)
Educational	Literate	98 (49.0)	**Occupation**	Housewife / Retired	82 (64.0)
Status	Primary Education	80 (40.0)		Employee	11 (5.5)
	Secondary Education	13 (6.5)		Civil Servant	9 (4.59
	University and above	9 (4.5)		Self-Employed	52 (26.0)
Working Status	Employed	34 (17.0)	**Place of**	City-District	156 (78.0)
	Unemployed	166 (83.0)	**Residence**	Village	44 (22.0)
Income Status	Income less than expenses	150 (75.0)			
	Income equal to expenses	50 (25.0)			
	Mean±SD			**Minimum-Maximum**	
Age, (*yıl*)	60.41±12.34			19-93	
BMI, (kg/m^2)	27.12±4.71			18.59-48.70	

n: Number of units; SD: Standard deviation; minimum: Smallest value; maximum: Largest value.

Table 2. Comparison of disease characteristics.

Characteristics		n (%)			n (%)
Presence of chronic disease,	Yes	53 (26.5)	**If yes,**	DM	103 (51.5)
				HT	106 (53.0)
	No	147 (73.5)		COPD	6 (3.0)
				CHD	9 (4.5)
Percutaneous Coronary Artery Intervention (PCAG),	Medical/Diagnostic	111(55.5)	**Number of PCAG Attempts,**	Never implemented	28 (14.0)
	Stent	60 (30.0)		1	85 (42.5)
	Balloon	4 (2.0)		2	39 (19.5)
	Balloon+Stent	25 (12.5)		3 and above	48 (24.0)
History of ACS/ MI,	Yes	65 (32.5)	**Complications after PCAI ACS,**	None	176 (88.0)
	No	135(67.5)		Bleeding	18 (9.0)
				Hematoma	6 (3.0)

n: Number of units; DM: diabetes mellitus; HT: hypertension; COPD: Chronic Obstructive Pulmonary Disease; CHD:chronic heart disease; MI:myocardial infarction; ACS:acute coronary syndrome

The mean total scores for both the importance of information needs and the extent to which these needs were fulfilled were nearly at the highest level, indicating that patients had a strong need for information, which was also sufficiently met. A statistically significant and strong correlation was found between all sub-items of the scale and the overall scores (p<0.001).

The adequacy of the sample for factor analysis was assessed using Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure for the NCPI-10 scale. For the assessment of the importance of information needs, the KMO value was 0.923 and Bartlett's test of sphericity yielded a chi-square value of 3637.793 (df = 45), both of which were significant (p < 0.001). Similarly, for the assessment of the fulfilment of information needs, the KMO value was 0.916, and the chi-square value was 3823.486 (df=45), both significant (p < 0.001) (Table 4).

In the internal consistency assessment of the scale, both satisfaction and item importance in all items were evaluated using Cronbach α coefficient. Cronbach's α coefficient was 0.97 for satisfaction and 0.98 for importance, indicating excellent internal consistency (α > 0.70) and high reliability of the scale. The factor structure was analysed by exploratory factor analysis, which indicated that the scale should be treated as a single dimension. The eigenvalues for the two dimensions were 8.36 and 8.73, explaining 83.64% and 87.36% of the variance, respectively (Table 4).

To further assess reliability, the scale was divided into two halves and the Guttman Split-Half Coefficient was calculated for the importance of information needs. The Guttman Split-Half coefficient is 0.923 and the correlation between the two halves is 0.858, indicating strong consistency and reliability (coefficient > 0.70) (Table 5). Although not included in the table, the Guttman Split-Half Coefficient was

Table 3. Description of the scores (n: 200).

Statements	Importance Mean±SD	Fulfilment Mean±SD
1. I would like to be informed of how responsible I am for my current PCI state of health	2.97±0.76	2.96±0.73
2. I would like to be informed of how I can self-manage my PCI in order to improve my health	2.94±0.76	2.92±0.76
3. I would like to be informed about my exact follow-up	2.94±0.76	3.01±0.74
4. I would like to be informed of every treatment I receive	2.91±0.77	2.91±0.78
5. I would like to be informed about the prognosis of my PCI	2.95±0.77	2.95±0.75
6. I would like to be informed about the impact of PCI on my professional life	2.87±0.85	2.88±0.83
7. I would like to be informed about the impact of PCI to my social life.	2.86±0.81	2.86±0.84
8. I would like to be informed about the necessary lifestyle changes due to PCI	2.87±0.80	2.85±0.85
9. I would like to receive written information about my PCI health (reason for re-admission, examinations, medications)	2.76±0.91	2.83±0.87
10 I would like to know if I can contact clinicians to be informed about my PCI	2.84±0.80	2.84±0.85
Total Score (Range 10-40)	28.92±7.32	29.03±7.52

SD: Standard deviation

Table 4. Construct validity.

	Total Score of Importance		Total Score of Fulfilment	
	rho	p-value	rho	p-value
Statement 1	0.879	0.000	0.891	0.000
Statement 2	0.916	0.000	0.944	0.000
Statement 3	0.940	0.000	0.822	0.000
Statement 4	0.949	0.000	0.926	0.000
Statement 5	0.936	0.000	0.942	0.000
Statement 6	0.897	0.000	0.968	0.000
Statement 7	0.943	0.000	0.965	0.000
Statement 8	0.935	0.000	0.969	0.000
Statement 9	0.802	0.000	0.960	0.000
Statement 10	0.937	0.000	0.975	0.000
KMO value	0.923	**0.001**	0.916	**0.001**
Chi-square	3637.793		3823.486	

calculated for the fulfilment of information needs. The coefficient is 0.957 and the correlation between the two halves is 0.930, confirming the high consistency and strong correlation between the two sets of items.

Table 5. Exploratory factor analysis.

	Total Score of Importance	Total Score of Fulfilment
	Factor 1	Factor 1
Statement 1	0.884	0.897
Statement 2	0.920	0.945
Statement 3	0.944	0.822
Statement 4	0.952	0.930
Statement 5	0.939	0.941
Statement 6	0.893	0.967
Statement 7	0.943	0.965
Statement 8	0.936	0.959
Statement 9	0.789	0.949
Statement 10	0.933	0.964
Eigenvalue	8.36	8.73
Variance Explained	83.649	87.369

DISCUSSION AND CONCLUSION

A patient-centered care approach aims to enhance patients' ability to care for themselves and improve their understanding of events related to their condition, ensuring better outcomes. This approach not only improves patients' quality of life but also helps to control healthcare costs. Given that patients are often discharged the day after undergoing percutaneous coronary intervention (PCI), healthcare professionals have limited time to provide pre-discharge information, making it challenging to assess and meet patients' informational needs fully.[16] Tailored educational interventions designed to address the specific needs of patients are highly effective. However, research shows that patients' information needs are often inadequately met, and nurses may not be sufficiently involved in delivering structured discharge education.[10]

The tools available to assess the information needs of patients undergoing percutaneous coronary artery intervention are limited. In a sample of Turkish patients receiving PCI, the NCPI-10 was found to be both valid and reliable. This 10-item scale, designed for quick completion, helps identify the specific information needs of PCI patients. Its versatility allows it to be used in both clinical settings and interview-based assessments, and it can also serve as a self-report instrument for patients.

PCI necessitates a thorough evaluation of the patient's needs. Patients undergoing coronary artery intervention require comprehensive information about their treatment, recovery process, medications, lifestyle changes, and potential complications. In addition to this, emotional support is essential to help patients cope with the procedure and its outcomes.[17]

Cronbach's alpha coefficient, which is an important indicator of scale reliability, is 0.98 for the importance and 0.97 for the fulfilment of information needs and has an extremely high internal consistency. A Cronbach's alpha coefficient of 0.70 or higher indicates strong reliability. The scale developed by Bubela et al. to assess patients' information needs and priorities at discharge has a Cronbach's alpha coefficient of 0.92. The similarity of the results between their study and our study further supports the excellent reliability of the NCPI-10 scale.

Test-retest reliability is another method used to assess the reliability of the PCI scale. In order to demonstrate test-retest reliability, the correlation coefficient between the scores obtained from the application of the measurement tool to the same group at different times should be at least 0.70.[18] In our study, test-retest reliability was found to be sufficient and the total correlation coefficient of the scale reached 0.95. This result indicates a high level of reliability. In addition, the test-retest reliability coefficient of the original scale was 0.80, which supports the acceptable and consistent reliability of the scale.

A sufficiently large sample size is necessary for scale research. While Bartlett's test was used to assess the sample size, Kaiser-Meyer-Olkin (KMO) metric was applied to assess its suitability for factor analysis. A KMO value greater than 0.60 is required for a comprehensive factor analysis.[19] In this study, the KMO values for scale fulfilment and importance level were 0.916 and 0.923, respectively. These values show that the sample is sufficient for a reliable factor analysis.

Bartlett's test is important because it indicates that the sample is sufficient and the correlation matrix is suitable for factor analysis.[20] In our study, the results of Bartlett's test of sphericity showed a chi-square

value of 3823.486 (df = 45) for satisfaction and 3637.793 (df = 45) for significance, both of which were statistically significant. It is recommended that factor loading values should be at least 0.40 or higher in the scale development and adaptation process. In our study, the factor loadings of the items in the NCPI-10 scale ranged between 0.78 and 0.96, indicating a strong factor structure and high item relevance.

In exploratory factor analysis (EFA), higher variance ratios, ideally 50% or above, indicate a stronger factor structure for a scale.[20] In this study, EFA results showed that factor loadings were adequate and explained variances exceeded 80%, which is considered to be an extremely high ratio and reflects a robust factor structure.

In conclusion, the NCPI-10 scale was found to be both valid and reliable in determining the information needs of patients undergoing percutaneous coronary intervention. We believe that this scale will be valuable in guiding nursing interventions during coronary angiography and will help better disease management for patients.

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