ORIGINAL RESEARCH
Urooncology

Doi: 10.4274/jus.galenos.2025.2025-3-4
J Urol Surg 2025;12(4):213-218

Investigation of the Psychometric Properties of the Turkish Version of the Expanded Prostate Cancer Index Composite for Clinical Practice (EPIC-CP)

Fatma Vural[1], Sevgi Çolak[2]

[1]Dokuz Eylül University Faculty of Nursing, Department of Surgical Nursing, İzmir, Türkiye
[2]Dokuz Eylül University Health Sciences Institute, Department of Surgical Nursing, İzmir, Türkiye

What's known on the subject? and What does the study add?

Expanded Prostate Cancer index for Clinical Practice (EPIC-CP) is a validated tool for assessing the quality of life in prostate cancer patients, but its Turkish version has not been studied. This study validates the Turkish version of EPIC-CP, demonstrating its high reliability and validity. The findings suggest that the Turkish EPIC-CP is a suitable tool for evaluating the quality of life in Turkish prostate cancer patients and can be used effectively in clinical and research settings.

Abstract

Objective: This study was conducted to examine the psychometric properties of the Turkish version of the Expanded Prostate Cancer index for Clinical Practice (EPIC-CP).

Materials and Methods: The sample of this study consisted of 80 patients diagnosed with prostate cancer who applied to urology and oncology outpatient clinics. Data were collected between February 2021 and July 2021. The content validity of the scale was evaluated by consulting 11 experts from the field of surgical nursing. The Content Validity index, Explanatory and Confirmatory Factor Analysis were used for validity, while Pearson Correlation Analysis and Cronbach Alpha Coefficient were used for reliability.

Results: Overall prostate cancer quality of life score (minimum 0-maximum 60). The score was calculated as 26.26±9.6. For the validity of the scale, it was determined that the Content Validity index was 1.0 for each item of the scale, the factors used in the Explanatory Factor Analysis explained 74.403% of the total variance, the factor loads of the items were over 0.40 in the Confirmatory Factor Analysis, and all correlation relationships were significant. The total Cronbach's α value, which shows the reliability and internal consistency of the scale, was determined to be 0.83.

Conclusion: As a result of the statistical evaluations, the Turkish validity and reliability of the EPIC-CP was found to be high. Considering these results, this developed scale can be used successfully for research to be conducted in Türkiye.

Keywords: Prostate cancer, quality of life, reliability, validity

Introduction

Prostate cancer is the second most common type of cancer among men worldwide, after lung cancer, and its incidence is increasing (1). According to GLOBACAN 2020 data: 1,414,259 men were diagnosed with prostate cancer and 375,304 men died from prostate cancer. 3.8% of all deaths from cancer in men are due to prostate cancer (2).

Today, due to the increase in population, the more frequent screening of serum prostate-specific antigen (PSA) values in men, the expansion of prostate biopsy indications, and advances in surgical techniques, more patients are diagnosed with prostate cancer. With the increase in early detection of prostate cancer and advances in treatment, the survival rates of patients are also increasing (2,3).

Correspondence: Fatma Vural Prof., Dokuz Eylül University Faculty of Nursing, Department of Surgical Nursing, İzmir, Türkiye
E-mail: fatmavural72@gmail.com **ORCID-ID:** orcid.org/0000-0001-6459-2584
Received: 10.03.2025 **Accepted:** 12.04.2025 **Epub:** 21.04.2025 **Publication Date:** 01.12.2025

Cite this article as: Vural F, Çolak S. Investigation of the psychometric properties of the Turkish version of the expanded prostate cancer index composite for clinical practice (EPIC-CP). J Urol Surg. 2025;12(4):213-218.

Although prostate cancer is asymptomatic at an early stage, patients may experience urinary retention, nocturia, hematuria, stool thinning due to rectal compression, painful defecation, weakness, anorexia, and weight loss in the later stages as the cancer progresses. According to the clinical stage of the disease, hormonal therapy, radiotherapy, chemotherapy, cryotherapy, or radical prostatectomy are among the treatment options (4,5).

Depending on the prostate cancer treatment method and complications, patients are faced with many conditions that will negatively affect their quality of life, such as urinary incontinence, changes in bowel habits, and sexual dysfunction. Each of these situations has negative effects on the perception of quality of life (6). Health-related quality of life is an important parameter in cancer management that enables clinicians to evaluate how treatment side effects affect patients. Validated and reliable measurement tools should be used to assess quality of life (6,7).

The University of California-Los Angeles Prostate Cancer index (UCLA-PCI) was developed by Litwin et al. (8) to assess the quality of life of patients with prostate cancer worldwide. The Expanded Prostate Cancer index Composite (EPIC), consisting of 50 items, EPIC-26, consisting of 26 items, were developed by Wei et al. (9), inspired by UCLA-PCI. Because these forms of EPIC are difficult to use, as the number of items is high and the application is impractical, the "Expanded Prostate Cancer index Composite for Clinical Practice (EPIC-CP)" consisting of 10 questions and 16 items was created. EPIC-CP is used in many studies evaluating the quality of life of patients with prostate cancer around the world (10).

Recently, a study to examine the Turkish psychometric properties of EPIC-CP, which is used by clinicians and researchers in the evaluation of the quality of life of patients with prostate cancer, has not been conducted. For this reason, this study, which examines the Turkish psychometric properties of EPIC-CP, will be useful in evaluating the quality of life of patients with prostate cancer and in planning care and interventions to improve it.

Materials and Methods

This research was conducted as a methodological study to examine the psychometric properties of the Turkish version of EPIC-CP. The sample of the study consisted of 80 patients who applied to the urology and oncology outpatient clinic of a university hospital between February and July 2021, and were diagnosed with prostate cancer. In the literature, it is recommended to calculate the sample size by taking at least 5 times the number of items in the measurement tool (11). EPIC-CP consists of 10 questions and 16 items. Therefore, 80 patients were included in the study, five times the total number of items.

Data were collected using the face-to-face interview method. Inclusion criteria: All patients diagnosed with prostate cancer, who are under treatment or under follow-up, who speak and understand Turkish, and who voluntarily agree to participate in the study. Exclusion criteria: patients with relapsed prostate cancer and patients with psychiatric problems using antipsychotic, antidepressant, and anxiolytic drugs.

Ethical Aspect of Research

Permission was obtained by e-mail from lead author Peter Chang, who developed the EPIC-CP scale. Ethics committee approval was obtained from the Non-Interventional Clinical Research Ethics Committee of a Dokuz Eylül University Hospital (date: 10.04.2019 and decision no: 2019/09-05). Then, permission was obtained from the institution where the study was conducted.

Data Collection Tools

Data were collected using the Patient Descriptive Characteristics Form and EPIC-CP prepared by the researchers. Patient Descriptive Characteristics Form: consists of 10 questions in total, in which socio-demographic characteristics of patients such as age, marital status, education level, and income level, and clinical characteristics such as the patient's PSA value, Gleason Score, tumor extent, and treatment methods are assessed. Information about the PSA value, Gleason score, and tumor spread of the patients was obtained from the medical records.

Expanded Prostate Cancer Index Composite for Clinical Practice (EPIC-CP)

This index, developed by Chang et al. (10), aims to evaluate the effect of treatment on the quality of life of prostate cancer patients in a short period of time. EPIC-CP is inspired by the first form of the index, EPIC, and the second, abbreviated form, EPIC-26. EPIC-CP is a Likert-type measurement tool consisting of 16 items, structured into 10 questions, with clinical ease of use. The index consists of five sub-dimensions that determine the quality of life of patients with prostate cancer. These: urinary incontinence, urinary irritation/retention, bowel functions, sexuality, and hormonal symptoms. The value given to each question is between zero and four points. Each sub-dimension ranges from zero to 12 points. Higher scores indicate worse symptom severity and worse quality of life. With EPIC-CP, both [the sub-dimensions affecting the quality of life of the prostate cancer patient can be evaluated (minimum 0-maximum 12)], as well as the general evaluation of the quality of life (minimum 0-maximum 60), can be conducted. The first item in the index is an independent general urinary disorder item with no scoring (10).

Statistical Analysis

In the analysis of the data using the IBM SPSS Statistics 21.0 program, number, percentage, and mean were used for descriptive statistics. The Content Validity index and Explanatory Factor Analysis were calculated for validity, while the Pearson Correlation Analysis and Cronbach's Alpha Coefficient were calculated for reliability. The AMOS program was used in the Confirmatory Factor Analysis, for validity. The conformity of the data to the normal distribution was evaluated with the Shapiro-Wilk test. P<0.05 was considered significant.

Results

Demographic and Clinical Characteristics

The mean age of the patients participating in the study was 72.96±8.44. Sixty-five percent were married, 52% were primary-secondary school graduates, 41% had income equal to expenditure, 49% had a Gleason score of 8 to 10, and 61% had metastatic spread of the tumor. The mean PSA value of the patients was found to be 28.39±4.31 ng/mL. The overall prostate cancer quality of life score was 26.26±9.6. When the sub-dimensions were examined, it was determined that the patients had the highest sexual symptom scores (8.62±2.39), which were significantly associated with a reduction quality of life (Table 1).

Table 1. Socio-demographic and clinical characteristics of patient (n=80)

Characteristics	n	%
Marital status		
Single	15	18.8
Married	65	81.3
Education level		
Illiterate	5	6.3
Primary-secondary school	52	65
High school	13	16.3
University	10	12.5
Income level		
Income less than expense	23	28.8
Income equals expense	41	51.3
Income is more than expense	16	20
Gleason score		
Gleason score ≤6	7	8.8
Gleason score 7	24	30
Gleason score 8-10	49	61.3
Spread of tumor		
Organ-limited	9	11.3
Local spread	10	12.5
Metastatic	61	76.3

n: Number of samples

Validity Analysis

Language Validity

For the EPIC-CP, which was translated into Turkish, opinions were obtained from 11 experts. To test the comprehensibility of the items in the language-valid scale, the scale was applied to a small group with the characteristics of the sample group. In this study, considering the number of scale items and the sample size, the instrument was applied to 8 prostate cancer patients with characteristics similar to those in the study. After the application, the comprehensibility of the questions was tested. Since no negative or positive feedback was received, the study continued. Patients participating in the pilot study were excluded from the sample.

Content Validity

Expert opinions were evaluated according to the Scope Validity index Davis technique. The experts were given the original form of EPIC-CP and the Turkish form together and were asked to assess and make a selection regarding the suitability of the scale items (A: item is appropriate, B: item should be reviewed, C: item should be seriously reviewed, D: item is not suitable). KGI is calculated as follows: The number of experts who assigned A and B to each item of the scale is divided by the total number of experts. If the KGI is greater than 0.80, the substance is considered sufficient in terms of scope validity (12). In this study, KGI was calculated as 1.0 for each item of the scale. According to expert opinions, the draft form of the scale was rearranged finalized.

Construct Validity

In the factor analysis, the Kaiser-Meyer-Olkin (KMO) test was applied to test whether the sample size was suitable for factor analysis. As a result of the analysis, the KMO value was 0.821. In addition, when the results of the Bartlett's Sphericity test were examined, it was seen that the obtained chi square value was acceptable [$\chi^2(78)=517.372$; $p<0.05$].

Descriptive and Confirmatory Factor Analysis

To reveal the factor pattern of the scale, principal components analysis was chosen as the factorization method and varimax was selected as the rotation method. In the explanatory factor analysis conducted to reveal the factor pattern of the scale, 3 items were removed from the scale due to low factor load (EPICCP7, EPICCP8, and EPICCP9) and the remaining 13 items were collected in 4 sub-dimensions. These factors explain 74.403% of the total variance (Table 2).

Confirmatory Factor Analysis was conducted to determine whether the items and their sub-dimensions explained the original structure of the scale. In the analysis, the factor loads of the substances were above 0.40 and all correlations were significant (Figure 1).

Reliability Analysis

Internal Consistency (Cronbach Alpha Coefficient)

When the reliability of the scale and sub-dimensions of the Turkish version of EPIC-CP was evaluated separately, the reliability coefficients were found to be 0.841 for the first dimension, 0.834 for the second dimension, 0.833 for the third dimension, 0.781 for the fourth dimension, and 0.874 for the overall scale, indicating a good degree of reliability. The fact that Cronbach's Alpha values are greater than 0.60 shows that the scales used are reliable (13). This meant that the scale used in the study was determined to have a good degree of reliability.

Item Analysis and Total Score Correlation

The relationship between the scores from the scale items, and the total score of the scale, is explained by item analysis and total score correlation. When the correlations between the variables are examined, the factor loadings of the substances are over 0.40 and all correlation relationships are significant (Table 3).

According to confirmatory factor analysis, the analysis determined that the 13 items and 4 sub-dimensions that make up the scale were related to the scale structure. The values accepted for the fit index calculations are shown in Table 4.

Discussion

The KGI of the EPIC-CP scale was calculated as 1.0 for each item. In the literature, it is emphasized that these rates should be above 0.80 (12). The results of this study showed that experts reached a consensus on the content of the scale.

The adequacy of the data and sample size for factor analysis was evaluated using the Bartlett's test of sphericity and the

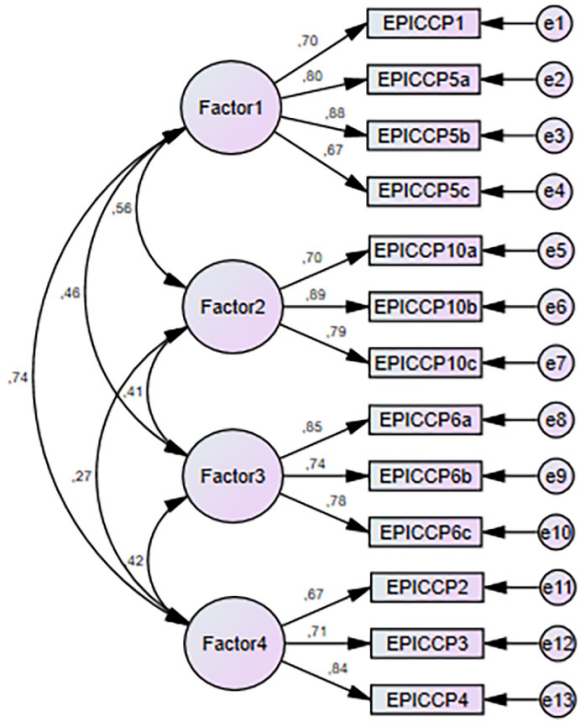

Figure 1. Model for first level multi-factor confirmatory factor analysis of the scale

Table 2. Explanatory factor analysis results of the scale

	Factors				
Items	**F1: Urine irritation/ retention**	**F2: Hormonal symptoms**	**F3: Bowel functions**	**F4: Urinary incontinence**	**Total item correlation**
EPICCP1	0.799				0.656
EPICCP5a	0.794				0.730
EPICCP5b	0.746				0.751
EPICCP5c	0.706				0.600
EPICCP10a		0.880			0.635
EPICCP10b		0.815			0.769
EPICCP10c		0.796			0.685
EPICCP6a			0.881		0.722
EPICCP6b			0.837		0.687
EPICCP6c			0.784		0.679
EPICCP2				0.838	0.610
EPICCP3				0.758	0.641
EPICCP4				0.681	0.640
Reliability	0.841	0.834	0.833	0.781	0.874
Variance explained (%)	22.026	18.339	18.140	15.899	74.403
KMO =0.824; χ^2(78) =517.372; Bartlett Sphericality test (p)=0.000, KMO: Kaiser-Meyer-Olkin test, p<0.05					

Table 3. Results regarding the measurement model of the scale					
Factors	**Expressions**	**Factor loadings**	**Standard error**	**t-values**	**p**
F1: Urinary irritation/retention	EPICCP1	0.700	-	-	-
	EPICCP5a	0.796	0.141	6.456	***
	EPICCP5b	0.881	0.141	6.986	***
	EPICCP5c	0.670	0.128	5.501	***
F2: Hormonal symptoms	EPICCP10a	0.702	-	-	-
	EPICCP10b	0.892	0.205	6.584	***
	EPICCP10c	0.791	0.174	6.300	***
F3: Intestinal functions	EPICCP6a	0.852	-	-	-
	EPICCP6b	0.743	0.115	6.601	***
	EPICCP6c	0.778	0.135	6.855	***
F4: Urinary incontinence	EPICCP2	0.666	-	-	-
	EPICCP3	0.713	0.260	5.238	***
	EPICCP4	0.837	0.308	5.697	***

***: p<0.05

Table 4. Scale structural model integrity of fit values		
	Structural model values	**Recommended values**
CMIN/DF	1.415	≤5
RMSEA	0.073	≤0.08
GFI	0.864	≥0.80
CFI	0.948	≥0.80
TLI	0.932	≥0.80
IFI	0.950	≥0.80
RFI	0.801	≥0.80
SRMR	0.074	≤0.10

KMO test. The Bartlett sphericity test value is expected to be statistically significant and the KMO value is expected to be higher than 0.60 (14). In this study, Exploratory Factor Analysis, KMO, and Bartlett's tests, met the necessary conditions, and the number of samples and data was suitable for factor analysis.

In the explanatory factor analysis performed to reveal the factor pattern of the scale, 3 items were removed from the scale (EPICCP7, EPICCP8, and EPICCP9) due to their low factor loading, and the remaining 13 items, were collected in 4 sub-dimensions. These factors explain 74.403% of the total variance. It is considered sufficient if the variance explained in multi-factor designs is above 50% (11).

EFA factor loads ranged from 0.68 to 0.88. The fact that the factor loadings measured from each sub-dimension are more than 0.30 indicates a strong factor structure (14). The results of this analysis showed that the factor loads in the EFA were at the desired level. In the original scale, the results could not be compared because EFA was not performed (10).

According to the CFA analysis, the fit indices were RMSEA ≤0.08, and GFI, CFI, IFI, RFI, NFI, NNFI were ≥0.80. These values indicate that there is a significant relationship between the scale and its sub-dimensions. According to the CFA results, the data were found to be compatible with the model, and the sub-dimensions were related to the scale. In the CFA analysis, the factor loads of the items varied between 0.67 and 0.89. The factor loads are above 0.40 and all correlation relationships are significant. In the original form of the scale, the results could not be compared because CFA was not performed (10).

Cronbach's alpha coefficient measures the average correlation between items in the scale. This value is expected to be close to 1 (15,16). In this study, the Cronbach's alpha coefficient for both the total scale and its sub-dimensions was greater than 0.70. This finding shows that the scale and its sub-dimensions are reliable. The items were sufficient to measure the relevant subject and the scale had good reliability. The Cronbach's alpha coefficient of the scale and sub-dimensions was found to be 0.64-0.84 in the original scale (10). Lourenço et al. (17), in 2020, found the Cronbach's alpha coefficient to be 0.35-0.82 for the sub-dimensions of the scale. The reliability coefficient results from this study were found to be consistent with those of the original scale.

To show that each item can measure at the expected level, an item-total score analysis was conducted to explain the relationship between the score of each item and the total score of the scale. This value is expected to be >0.40 (15). The total score correlation of the Turkish version of the scale was 0.67 to 0.89. These results show that the sub-dimensions of the scale are correlated with the total score and each item is reliable. The item total score analysis in the original scale was found to be ranging from 0.31-0.83 (10). However, since the section on sexual problems, which reduced the item total score, was included in its original format in the analysis, the item-total score correlation was higher in this study.

As a result, the Turkish version of EPIC-CP consists of four sub-dimensions and 13 items. Each sub-dimension is scored as 0-12 points. The total score of the scale is the sum of all sub-dimensions, totaling 48.

Study Limitations

Some patients in the study had undergone open radical prostatectomy, and patients who had other surgical treatment options (laparoscopic or robotic radical prostatectomy) were not included in the sample. This situation may affect the generalizability of the scale. In addition, while the scale originally had five sub-dimensions, it was reduced to four in the Turkish version, with the sexuality sub-dimension being removed from the scale. The absence of a sexuality sub-dimension in the Turkish version creates a limitation.

Conclusion

The Turkish validity and reliability of EPIC-CP are high. It is thought that its use in Turkish society will be useful in evaluating the quality of life of patients with prostate cancer and in planning care and interventions to improve it.

Ethics

Ethics Committee Approval: Ethics committee approval was obtained from the Non-Interventional Clinical Research Ethics Committee of a Dokuz Eylül University Hospital (date: 10.04.2019 and decision no: 2019/09-05).

Informed Consent: Informed consent was obtained from all individual participants included in this study.

Footnotes

Authorship Contributions

Concept: F.V., S.Ç., Design: F.V., S.Ç., Data Collection or Processing: S.Ç., Analysis or Interpretation: F.V., S.Ç., Literature Search: F.V., S.Ç., Writing: F.V., S.Ç.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

References

1. NICE Guidance - Prostate cancer: diagnosis and management: © NICE (2019) prostate cancer: diagnosis and management. BJU Int. 2019;124:9-26. [Crossref]
2. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, Bray F. Global Cancer Statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2021;71:209-249. [Crossref]
3. Taneja SS. Urological oncology: prostate cancer. J Urol. 2022;208:736-738. [Crossref]
4. Sekhoacha M, Riet K, Motloung P, Gumenku L, Adegoke A, Mashele S. Prostate cancer review: genetics, diagnosis, treatment options, and alternative approaches. Molecules. 2022;27:5730. [Crossref]
5. European Association of Urology. Prostate Cancer Guideline 2022. [Date of access: 27.07.2023]. [Crossref]
6. Rush HL, Murphy L, Morgans AK, Clarke NW, Cook AD, Attard G, Macnair A, Dearnaley DP, Parker CC, Russell JM, Gillessen S, Matheson D, Millman R, Brawley CD, Pugh C, Tanguay JS, Jones RJ, Wagstaff J, Rudman S, O'Sullivan JM, Gale J, Birtle A, Protheroe A, Gray E, Perna C, Tolan S, McPhail N, Malik ZI, Vengalil S, Fackrell D, Hoskin P, Sydes MR, Chowdhury S, Gilbert DC, Parmar MKB, James ND, Langley RE. Quality of life in men with prostate cancer randomly allocated to receive docetaxel or abiraterone in the STAMPEDE trial. J Clin Oncol. 2022;40:825-836. [Crossref]
7. Miyoshi Y, Morizane S, Honda M, Hikita K, Iwamoto H, Yumioka T, Kimura Y, Yoshioka SI, Takenaka A. Health related quality of life in Japanese patients with localized prostate cancer: comparative retrospective study of robot-assisted laparoscopic radical prostatectomy versus radiation therapy. Yonago Acta Med. 2020;63:55-62. [Crossref]
8. Litwin MS, Hays RD, Fink A, Ganz PA, Leake B, Brook RH. The UCLA prostate cancer index: development, reliability, and validity of a health-related quality of life measure. Med Care. 1998;36:1002-1012. [Crossref]
9. Wei JT, Dunn RL, Litwin MS, Sandler HM, Sanda MG. Development and validation of the expanded prostate cancer index composite (EPIC) for comprehensive assessment of health-related quality of life in men with prostate cancer. Urology. 2000;56:899-905. [Crossref]
10. Chang P, Szymanski KM, Dunn RL, Chipman JJ, Litwin MS, Nguyen PL, Sweeney CJ, Cook R, Wagner AA, DeWolf WC, Bubley GJ, Funches R, Aronovitz JA, Wei JT, Sanda MG. Expanded prostate cancer index composite for clinical practice: development and validation of a practical health related quality of life instrument for use in the routine clinical care of patients with prostate cancer. J Urol. 2011;186:865-872. [Crossref]
11. Althubaiti A. Sample size determination: a practical guide for health researchers. J Gen Fam Med. 2022;24:72-78. [Crossref]
12. Davis, LL. Instrument review: getting the most from a panel of experts. Applied Nursing Research. 1992;25:194-197. [Crossref]
13. Shrestha N. Factor analysis as a tool for survey analysis. American Journal of Applied Mathematics and Statistics. 2021;9:4-11. [Crossref]
14. Terwee CB, Bot SD, de Boer MR, van der Windt DA, Knol DL, Dekker J, Bouter LM, de Vet HC. Quality criteria were proposed for measurement properties of health status questionnaires. J Clin Epidemiol. 2007;60:34-42. [Crossref]
15. Tsai YS, Fang TP, Chi CC. A scale for measuring evidence-searching capability: a development and validation study. J Eval Clin Pract. 2019;25:676-681. [Crossref]
16. Rattray J, Jones MC. Essential elements of questionnaire design and development. J Clin Nurs. 2007;16:234-243. [Crossref]
17. Lourenço DB, Amaral BS, Alfer-Junior W, Vasconcellos A, Russo F, Sanchez-Salas R, Bianco B, Wagner AA, Chang P, Moschovas MC, Lemos GC, Carneiro A. Portuguese version of the expanded prostate cancer index composite for clinical practice (EPIC-CP): psychometric validation and prospective application for early functional outcomes at a single institution. BMC Urol. 2020;20:163. [Crossref]