

Transcultural adaptation of the user satisfaction scale to the health service: Brazilian version of the EORTC IN-PATSAT32 questionnaire

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Abstract

Objective To describe the cross-cultural adaptation and psychometric properties of the Brazilian version of the IN-PATSAT32 questionnaire.

Methods The questionnaire was applied to 328 patients in a public hospital, and the retest was performed with 86 patients, approximately 1 week after the test. Psychometric analyses were performed to evaluate the structure, reliability, and internal consistency of the questionnaire.

Results The adapted questionnaire presented high sensitivity and the intraclass correlation coefficient ($ICC > 8$) indicated strong convergent validity and discriminant properties of the instrument, as well as high internal consistency (Cronbach's $\alpha > 0.8$). Exploratory factor analysis divided the questionnaire into five dimensions: satisfaction with a multidisciplinary team ($\alpha = 0.953$, $kp = 0.61$, $ICC = 0.953$), doctors ($\alpha = 0.993$, $kp = 0.817$, $ICC = 0.966$), therapeutic ($\alpha = 0.946$, $kp = 0.869$, $ICC = 0.972$), hospital structure ($\alpha = 0.97$, $kp = 0.87$, $ICC = 0.947$), and hospital discharge.

Conclusion The results indicated that the Brazilian version maintained its psychometric properties when used in a heterogeneous population and with different diagnoses and stages of treatment for cancer.

Practice implications This questionnaire can be used in the Brazilian hospital routine to gauge the satisfaction of patients with hospitalization.

Keywords EORTC · Cancer · Psychometric properties · Patient satisfaction

Introduction

Patient satisfaction or patient opinion about the quality of services has been recognized as essential to define the quality of health services provided [1]. Patient satisfaction is recognized as a key indicator of the quality of health care [2]. However, sufficient information was not yet available on patients' satisfaction with care in oncology hospitals during the hospitalization period [1]. Studies have been developed around the world to evaluate the satisfaction of cancer patients (inpatient or outpatient) with the care received. However, there were numerous differences between these studies, including the instrument used to measure satisfaction, type of population affected, sample size, study design, and outcome measures. Thus, it is difficult to compare the results obtained using different methodologies [3].

To promote this information and standardize the research, the EORTC (European Organization for Research and Treatment of Cancer) has created the IN-PATSAT32 questionnaire, the target audience of which is inpatients. The research for the formulation of the IN-PATSAT32 involved the analysis of existing patient satisfaction questionnaires, as well as interviews with specialists in oncology and cancer patients [4]. This instrument was developed to obtain information from patients to improve understanding of the problems encountered in the health services

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provided and to assist in the monitoring, planning, and improvement of services and care [1].

The IN-PATSAT32 scale has 32 items scored on a 5-point Likert scale. The instrument items are divided into four areas: quality of hospital doctors and nurses, service organization, and general aspects. Among these dimensions, it can be further separated into scales with 11 multiple items and three unique items. Multiple items were grouped into ranges: technical skills of doctors (issues 1–3), interpersonal skills (questions 4–6), provision of information (questions 7–9), availability (questions 10 and 11); nurses' technical skills (questions 12–14), interpersonal skills (questions 15–17), provision of information (18–20), availability (21 and 22); interpersonal skills of the rest of the hospital staff (questions 24–26); wait times (questions 27 and 28) and hospital access (questions 29 and 30). The unique items were exchange of information (question 23), comfort (question 31), and general satisfaction (question 32) [1].

The instrument, however, does not have a validated version for the Brazilian context. In 2014, the first stage of semantic, item, and conceptual equivalence was successfully performed at the National Cancer Institute. In this stage, the present study was carried out, the objective of which was to validate and analyze the psychometric properties and test–retest reliability of the IN-PATSAT32 instrument for the Brazilian reality, in order that it may be used to analyze patients' satisfaction with the care received in the country's cancer hospitals.

Methods

This was a cross-sectional study that used the translated Brazilian version of the EORTC IN-PATSAT32 [5] by Belmiro et al. (2015), following the principles of translation and adaptation previously described [6, 7]. It was conducted with patients admitted to the clinical and surgical infirmary of Cancer Hospital I, at the National Cancer Institute José Alencar Gomes da Silva (INCA), a public hospital in the city of Rio de Janeiro, Brazil. Patients over 18 years of age, belonging to both sexes and social classes, who signed the free and informed consent terms (TCLE) of the project approved by the INCA Ethics Committee, were invited to participate in the study.

The test–retest stage was performed as an interview as proposed by Belmiro et al. [5]. The patients admitted to the INCA wards were approached by the principle investigator, and those who agreed were immediately subjected to the socio-economic questionnaire, followed by 32 questions from the IN-PATSAT32 questionnaire. We interviewed 328 patients, following the criterion of convenience [8]. The retest was performed through an interview using the

same questionnaire. At this stage, we interviewed 86 patients, approximately one week after they had responded to the test.

The results found in the test and retest stages were plotted in databases, using double independent typing in the Excel program, with subsequent verification and correction of possible inconsistencies. Values were assigned to the questionnaire responses, where 1 indicated poor—the lowest level of satisfaction, 2 reasonable, 3 good, 4 very good, and 5 excellent. SPSS software version 22 was used for statistical analysis.

The marginal effects for each dimension were calculated according to the percentage of questions that received minimum and maximum values, respectively, in each dimension. The low value for floor effects represents the ability of this instrument to identify the patients who reported higher levels of expectations combined with lower levels of satisfaction. In the meantime, the frequency of ceiling effects represents the sensitivity of the instrument to distinguish patients with the highest level of expectation [9]. To evaluate the convergence of the items and the discriminant validity, a matrix correlation of the 11 multiple scales with their own items was performed. Convergent validity was confirmed when the correlation between each item and its own scale was greater than 0.4, which indicates that the item and the scale represent the same concept. In addition, we considered the discriminant validity favorable when the correlation between each item with its own scale was greater than the correlation with the other scales [9].

The internal consistency and reliability of the test–retest step were analyzed to estimate the reliability of the scales and items of the instrument. The Cronbach's alpha coefficient was used for internal consistency analysis, with a minimum value of 0.70 as an indicator that the items on a sub-scale evaluated the same theoretical construct [10]. The reliability of the scale items was estimated using the kappa with quadratic weighting (kp) [11]. Disagreements were weighted by the squares of deviations from exact agreement, and 95% confidence intervals were estimated. The cutoff points indicated by Byrt et al. [12] for classification of the level of stability of the responses were used: weak (0.01–0.20); mild (0.21–0.40); reasonable (0.41–0.60); good (0.61–0.80); very good (0.81–0.92); and excellent (0.93–1.00). The intraclass correlation coefficient (ICC) was applied to the test–retest scores, resulting from the sum of the answers obtained in each item.

Exploratory factorial analysis was also performed to verify the permanence of the four dimensions presented in the original version of the instrument. The exploratory factor analysis phase included the extraction of the factors according to eigenvalue and oblique rotation criteria, using matrices of tetrachoric correlations, which better represent

the categorical response variables used in the IN-PAT-SAT32. Loads of 0.4 or more were considered as relevant in the obtained factors, and the obtained structure was compared with the proposed and validated structure as IN-PATSAT32. To assess the adequacy of the dimensional structure, the Kaiser–Meyer–Olkin tests and the Bartlett sphericity test [13, 14] were performed.

Results

The study included 328 patients who were subjected to interviews to complete the EORTC IN-PATSAT32 questionnaire. This proposal was made to allow the participation of patients with a low educational level, as this difficulty was noted by the authors mentioned above [5]. Table 1 shows that there was average satisfaction with practically all items, besides a high standard deviation among the scores, indicating a high sensitivity of the questionnaire used. Also, a low value for the floor effect (less than 10%) and high value for the ceiling (greater than or equal to 10%) were observed, indicating that the patients assigned high values in all dimensions.

The convergent validity and item-scale correlation aspects of EORTC IN-PATSAT32 can be observed in Table 2, where a strong correlation is highlighted in most sub-scales. Only in the item dealing with the provision of information by nursing professionals was a lower correlation noted. In the other items evaluated, the average

correlation of the items with the others of the same scale exceeded 0.8%, indicating high convergent validity. In addition, the intraclass correlation of each scale was higher than that of the other items, reinforcing the discriminant property of the adapted questionnaire. The Pearson correlation coefficient was used among the subscales and indicated inter-scale correlation (Table 3).

Exploratory factor analysis showed the formation of five dimensions, and a variance of 73.62% supported the instrument, considering that a value greater than 40% indicates relevance (Table 4). Other results obtained prior to the exploratory factorial analysis, such as the Kaiser–Meyer–Olkin index (94.9) and Bartlett’s sphericity [χ^2 8430.84 (496 gl), $p < 0.001$], also demonstrated the significance of the model. The first dimension was formed from questions 12–24 and 32 and was called “Satisfaction with the multidisciplinary team”, which shows that, unlike in the validation study of the original instrument, patients could not easily discern the team of nursing professionals from the other health professionals involved in care during hospitalization, thus characterizing a job with a profile associated with care, and less with cure or treatment in the strictest sense. The second dimension was titled “Satisfaction with doctors” and encompassed questions 2 through 7, 10 and 11, while the third dimension included questions 1, 8, 9, 25, 27, and 28 and was named “Satisfaction with therapeutic conduct”. The fourth dimension was called “Satisfaction with hospital structure” and included questions 29–31, and the fifth dimension was

Table 1 Satisfaction scores with care according to EORTC-IN-PATSAT32

Scale	Code	Scale name	Items	Average	SD	Floor effect		Ceiling effect	
						n	%	n	%
Doctors	SATDTS	Technical skills	1–3	68.16	17.52	7	2.2	79	24.1
	SATDIS	Interpersonal skills	4–6	59.18	29.56	19	5.7	59	18.2
	SATDIP	Provision of information	7–9	50.43	28.25	15	4.5	33	10
	SATDAV	Availability	10, 11	56.11	26.17	22	6.7	59	18
Nursing team	SATNTS	Technical skills	12–14	66.09	25.14	1	0.2	76	23.3
	SATNIS	Interpersonal skills	15–17	62.64	25.33	3	0.8	53	16.3
	SATNIP	Provision of information	18–20	55.71	28.75	4	1.3	33	10
	SATNAV	Availability	21, 22	59.89	27.58	16	4.9	61	18.7
Other areas	SATOTH	Interpersonal skills and provision of information of the rest of the hospital staff	24–26	57.81	23.71	3	0.9	45	13.8
	SATWAI	Wait time	23	57.73	26.87	19	5.7	48	14.8
	SATACC	Hospital access	27, 28	52.31	27.68	14	4.4	46	14
	SATEXE	Exchange of information	29, 30	58.13	28.01	19	5.7	62	19.1
	SATCOM	Comfort	31	52.09	26.33	32	9.8	62	19
	SATGEN	General satisfaction	32	56.37	24.86	21	6.4	66	20.3

SD standard deviation

Table 2 Aspects of convergent validity and item-scale correlation of EORTC-IN-PATSAT32

Item	SATDTS	SATDIS	SATDIP	SATDAV	SATNTS	SATNIS	SATNIP	SATNAV	SATOTH	SATACC	SATEXE
1	0.899	0.621	0.460	0.656	0.575	0.387	0.203	0.391	0.515	0.445	0.384
2	0.907	0.680	0.500	0.670	0.531	0.375	0.256	0.446	0.573	0.520	0.364
3	0.930	0.754	0.551	0.723	0.512	0.374	0.290	0.387	0.591	0.481	0.422
4	0.757	0.920	0.594	0.675	0.580	0.498	0.305	0.492	0.630	0.512	0.439
5	0.697	0.896	0.600	0.654	0.531	0.483	0.305	0.506	0.582	0.465	0.330
6	0.652	0.942	0.735	0.704	0.540	0.546	0.336	0.481	0.604	0.429	0.382
7	0.587	0.636	0.866	0.614	0.364	0.357	0.365	0.301	0.450	0.346	0.313
8	0.482	0.635	0.945	0.571	0.286	0.359	0.483	0.308	0.436	0.300	0.196
9	0.502	0.673	0.921	0.596	0.340	0.406	0.391	0.311	0.485	0.310	0.250
10	0.616	0.603	0.589	0.851	0.413	0.382	0.391	0.324	0.448	0.446	0.315
11	0.723	0.716	0.571	0.925	0.493	0.429	0.261	0.439	0.602	0.549	0.498
12	0.546	0.578	0.324	0.488	0.906	0.644	0.352	0.610	0.527	0.409	0.362
13	0.595	0.563	0.336	0.537	0.966	0.733	0.427	0.709	0.622	0.492	0.486
14	0.572	0.607	0.361	0.514	0.954	0.817	0.501	0.722	0.620	0.497	0.458
15	0.469	0.626	0.401	0.465	0.809	0.899	0.529	0.726	0.567	0.437	0.391
16	0.218	0.418	0.337	0.300	0.530	0.877	0.598	0.610	0.344	0.309	0.069
17	0.469	0.467	0.336	0.460	0.716	0.873	0.502	0.744	0.526	0.400	0.348
18	0.396	0.450	0.591	0.482	0.514	0.703	0.511	0.614	0.380	0.461	0.330
19	0.526	0.606	0.691	0.599	0.736	0.885	0.852	0.818	0.577	0.657	0.456
20	0.333	0.418	0.482	0.398	0.466	0.547	0.971	0.554	0.342	0.416	0.200
21	0.390	0.470	0.292	0.369	0.600	0.710	0.518	0.955	0.502	0.500	0.297
22	0.481	0.549	0.321	0.468	0.739	0.756	0.489	0.931	0.632	0.542	0.405
23	0.558	0.555	0.419	0.568	0.544	0.494	0.339	0.502	0.491	0.664	0.563
24	0.541	0.546	0.372	0.560	0.579	0.546	0.318	0.588	0.860	0.605	0.461
25	0.581	0.612	0.470	0.574	0.527	0.458	0.208	0.499	0.901	0.633	0.547
26	0.598	0.633	0.506	0.537	0.567	0.460	0.261	0.543	0.899	0.680	0.612
27	0.548	0.550	0.374	0.541	0.493	0.426	0.316	0.546	0.606	0.942	0.583
28	0.498	0.450	0.302	0.548	0.423	0.389	0.192	0.503	0.526	0.970	0.550
29	0.316	0.313	0.185	0.357	0.312	0.183	0.148	0.276	0.450	0.436	0.881
30	0.472	0.443	0.325	0.481	0.487	0.341	0.141	0.355	0.586	0.498	0.849
31	0.308	0.286	0.149	0.405	0.398	0.342	0.215	0.371	0.447	0.511	0.452
32	0.541	0.520	0.270	0.500	0.601	0.493	0.276	0.583	0.584	0.450	0.620

Satisfaction with the doctors: *SATDTS* technical skills, *SATDIS* interpersonal skills, *SATDIP* provision of information, *SATDAV* availability; Nursing team care: *SATNTS* technical skills, *SATNIS* interpersonal skills, *SATNIP* provision of information, *SATNAV* availability; other areas: *SATOTH* interpersonal skills and provision of information of the rest of the hospital staff, *SATWAI* wait time, *SATACC* hospital access, *SATEXE* exchange of information, *SATCOM* comfort, *SATGEN* general satisfaction

Bold values highlight the items that compose the subscale referred on the columns (i.e., items 1, 2 and 3 refer to scale SATDTS, items 4, 5 and 6 refer to scale SATDIS,...)

composed only of question 26, which shows discharge from the hospital as an isolated issue, and for that reason, was entitled “Satisfaction with discharge”.

The Cronbach’s alpha coefficient attested to the high internal consistency, as it was greater than 0.8 in all subscales analyzed, as well as in the dimensions formulated after the exploratory factorial analysis, in which Cronbach’s alpha was higher than 0.9 (Table 5). The weighted kappa value had an amplitude of 0.58–0.76, while in the analysis, the dimensions ranged from 0.61 to 0.87.

The test–retest stage was conducted approximately 1 week after the original test, with 86 patients re-interviewed. In Table 5, a strong correlation can be observed among all scales in this step, with the intraclass correlation coefficient ranging from 0.77 to 0.93. No significant difference was observed between patient satisfaction on the scales analyzed in the test and retest during their hospital stay, for both the subscales and the five dimensions formulated ($p > 0.05$).

Table 3 Inter-scale correlation coefficients in EORTC-IN-PATSAT32

	SATDTS	SATDIS	SATDIP	SATDAV	SATNTS	SATNIS	SATNIP	SATNAV	SATOTH	SATWAI	SATACC	SATEXE	SATCOM	SATGEN
SATDTS	1													
SATDIS	0.920	1												
SATDIP	0.812	0.852	1											
SATDAV	0.781	0.853	0.853	1										
SATNTS	0.763	0.743	0.643	0.713	1									
SATNIS	0.731	0.741	0.661	0.711	0.901	1								
SATNIP	0.662	0.712	0.702	0.682	0.812	0.852	1							
SATNAV	0.694	0.704	0.664	0.644	0.824	0.844	0.894	1						
SATOTH	0.581	0.591	0.601	0.621	0.691	0.641	0.721	0.711	1					
SATWAI	0.579	0.649	0.699	0.599	0.709	0.729	0.809	0.769	0.799	1				
SATACC	0.470	0.480	0.530	0.510	0.600	0.590	0.680	0.640	0.710	0.820	1			
SATEXE	0.317	0.387	0.427	0.377	0.357	0.387	0.467	0.417	0.467	0.577	0.657	1		
SATCOM	0.400	0.440	0.460	0.460	0.490	0.510	0.530	0.520	0.530	0.600	0.590	0.650	1	
SATGEN	0.520	0.550	0.520	0.540	0.710	0.710	0.650	0.630	0.590	0.720	0.690	0.530	0.690	1

Satisfaction with the doctors: *SATDTS* technical skills, *SATDIS* interpersonal skills, *SATDIP* provision of information, *SATDAV* availability; Nursing team care: *SATNTS* technical skills, *SATNIS* interpersonal skills, *SATNIP* provision of information, *SATNAV* availability; other areas: *SATOTH* interpersonal skills and provision of information of the rest of the hospital staff, *SATWAI* wait time, *SATACC* hospital access, *SATEXE* exchange of information, *SATCOM* comfort, *SATGEN* general satisfaction

Discussion and conclusion

Discussion

Most questionnaires for patient satisfaction analysis have been developed in Anglo-Saxon cultures, which makes it difficult to cross-culturally compare the quality of health services available around the world [15]. The present work on cross-cultural adaptation of the EORTC IN-PATSAT32 questionnaire for Brazil used the original version of the instrument, developed by the EORTC [1].

The results presented were satisfactory and indicated that the Brazilian version of the questionnaire maintained the psychometric properties when used in a heterogeneous population and with different diagnoses and stages of treatment for cancer. The study was conducted from interviews with inpatients, as suggested by Belmiro et al. [5], who carried out the pre-testing and translation stages of the instrument. Other authors did not verify this need, even with patients of low educational level [9]. Meanwhile, in Sri Lanka, interviews were conducted in patients who were unable to read or had no glasses [15]. Thus, one of the limitations pointed out in previous studies [16] was addressed, as all the data necessary to conduct the study were collected through the interview, and we did not exclude any patient from participation.

We would like to emphasize patients' suggestions during the pilot project, which are not included in the IN-PATSAT32 questionnaire [9]. According to these authors, patients cited satisfaction with food, comfort for family members, and treatment expenses. In addition to these points, in our study, aspects such as cleaning and comfort of the bathrooms, the safety of the hospital and surrounding area, and the absence of an emergency call mechanism in some beds were reported.

The ceiling effect (the majority of patients indicating the maximum) and the floor effect (most of the patients indicating the minimum) were adopted as measures of the range of the scales [17]. The floor (0.2–9.8%) and ceiling (10–24%) effects were evaluated in all subscales. Our results were similar to those found in Iran [9] (floor effect: 0.5–11.5%, ceiling effect: 10.2–24.2%) and diverged from findings with Spanish patients [18] (floor effect: 0–1.3%, ceiling effect: 6.4–46.3%). These results point out that our questionnaire has higher discriminatory power than the validated scale in Spain and, thus, detects differences between groups of cancer patients [9].

As described in the literature, convergent validity occurs when there is a correlation greater than 0.4 between an item and its own sub-scale, excluding the item itself to avoid overlap [1]. As in works developed in Europe and Asia [1], Sri Lanka [15], Morocco [19], Iran [9], and China [17, 20],

Table 4 Factorial pattern and eigenvalues of the Brazilian version of EORTC-INPATSAT32 after varimax rotation

Dimension—scale items	Factor loading	Eigenvalues	(%) variance
Satisfaction with multidisciplinary team		15.59	48.70
12 The way they carried out your physical examination (took your temperature, felt your pulse,...)?	0.581		
13 The way they handled your care (gave your medicines, performed injections,...)?	0.685		
14 The attention they paid to your physical comfort?	0.684		
15 The interest they showed in you personally?	0.710		
16 The comfort and support they gave you?	0.725		
17 The human qualities (politeness, respect, sensitivity, kindness, patience,...)?	0.748		
18 The information they gave you about your medical test?	0.621		
19 The information they gave you about your care?	0.694		
20 The information they gave you about your treatment?	0.675		
21 Their promptness in answering your buzzer calls?	0.733		
22 The time they devoted to you?	0.736		
23 The exchange of information between caregivers?	0.748		
24 The kindness and helpfulness of the technical, reception, laboratory personnel?	0.781		
32 How would you rate the care received during your hospital stay?	0.796		
Satisfaction with doctors		3.19	9.91
2 The treatment and medical follow-up they provided?	0.796		
3 The attention they paid to your physical problems?	0.810		
4 Their willingness to listen to all your concerns?	0.710		
5 The interest they showed in you personally?	0.790		
6 The comfort and support they gave you?	0.799		
7 The information they gave you about your illness?	0.833		
10 The frequency of their visits/consultations?	0.742		
11 The time they devoted to you during visits/consultations?	0.813		
Satisfaction with therapeutic conduct		2.67	8.00
1 The knowledge and experience of your illness?	0.728		
8 The information they gave you about your medical tests?	0.732		
9 The information they gave you about your treatment?	0.762		
25 The information provided on your admission to the hospital?	0.110		
27 The waiting time for obtaining results of medical test?	0.694		
28 The speed of implementing medical test and/or treatments?	0.603		
Satisfaction with hospital structure		1.41	3.67
29 The ease of access (parking, means of transport,...)?	0.237		
30 The ease of finding one's way to the different department?	0.543		
31 The environment of the building (cleanliness, spaciousness, calmness,...)?	0.698		
Satisfaction with hospital discharge		1.04	3.34
26 The information provided on your discharge from the hospital?	0.793		

all items presented convergent validity with their subscales. The validity of the construct was assessed through inter-scale correlation, where it is expected that the subscales of the IN-PATSAT32 that are conceptually related are substantially correlated with each other ($r \geq 0.4$) [15]. This

parameter was reached in all subscales, except for exchange of information, technical and interpersonal skills of doctors and nurses, and availability of doctors. This result points to a deficiency in the exchange of information among hospital health professionals.

Table 5 Reliability and internal consistency of EORTC-IN-PATSAT32 subscales, dimensions, and total score

Questionnaire	Test average (SD)	Retest average (SD)	Kappa weighted	IC 95% (kappa)		ICC	CI 95% (ICC)		P value	Cronbach's alpha
				LL	UL		LL	UL		
Scales										
SATDTS	63.6 (30.2)	64.8 (26.1)	0.638	0.568	0.708	0.925	0.855	0.995	0.61	0.905
SATDIS	58.7 (26.1)	59.1 (24.5)	0.645	0.555	0.735	0.93	0.84	1.02	0.48	0.885
SATDIP	64.5 (27.4)	65.7 (25.2)	0.59	0.52	0.66	0.893	0.823	0.963	0.7	0.936
SATDAV	71.9 (25.5)	70.1 (24.1)	0.578	0.448	0.708	0.807	0.677	0.937	0.76	0.888
SATNTS	65.4 (26.2)	63.2 (24.8)	0.617	0.517	0.717	0.921	0.821	1.021	0.82	0.947
SATNIS	48.9 (31.8)	49.4 (29.3)	0.66	0.61	0.71	0.855	0.805	0.905	0.63	0.956
SATNIP	61.2 (25.9)	60.7 (26.7)	0.69	0.6	0.78	0.941	0.851	1.031	0.58	0.978
SATNAV	63.5 (27.1)	62.4 (28.5)	0.76	0.67	0.85	0.856	0.766	0.946	0.56	0.936
SATOTH	61.8 (26.2)	61.5 (24.9)	0.711	0.591	0.831	0.882	0.762	1.002	0.62	0.937
SATWAI	–	–	–	–	–	–	–	–	–	–
SATACC	66.5 (22.9)	65.3 (21.6)	0.698	0.618	0.778	0.858	0.778	0.938	0.91	0.921
SATEXE	61.8 (23.3)	61.3 (19.9)	0.625	0.515	0.735	0.773	0.663	0.883	0.86	0.864
SATCOM	–	–	–	–	–	–	–	–	–	–
SATGEN	–	–	–	–	–	–	–	–	–	–
Total	76.10 (23.4)	74.2 (24.5)	0.84	0.82	0.86	0.968	0.948	0.988	0.47	0.968
Dimensions after exploratory factor analysis										
Satisfaction with a multidisciplinary team	60.6 (23.8)	61.2 (22.7)	0.61	0.58	0.64	0.953	0.923	0.983	0.8	0.953
Satisfaction with doctors	68.7 (26.3)	68.5 (23.6)	0.817	0.797	0.837	0.966	0.946	0.986	0.73	0.993
Satisfaction with therapeutic conduct	58.9 (25.2)	59.6 (24.7)	0.869	0.859	0.879	0.972	0.962	0.982	0.7	0.946
Satisfaction with hospital structure	49.3 (28.5)	48.2 (27.3)	0.87	0.82	0.92	0.947	0.897	0.997	0.68	0.97
Satisfaction with hospital discharge	–	–	–	–	–	–	–	–	–	–

Satisfaction with the doctors care: *SATDTS* technical skills, *SATDIS* interpersonal skills, *SATDIP* provision of information, *SATDAV* availability; Nursing team care: *SATNTS* technical skills, *SATNIS* interpersonal skills, *SATNIP* provision of information, *SATNAV* availability; other areas: *SATOTH* interpersonal skills and provision of information of the rest of the hospital staff, *SATWAI* wait time, *SATACC* hospital access, *SATEXE* exchange of information, *SATCOM* comfort, *SATGEN* general satisfaction. *ICC* intraclass correlation coefficient, *SD* standard deviation, *LL* lower limit, *UL* upper limit, *CI* confidence interval

Exploratory factorial analysis made it possible to reorganize the items and reformulate the scale dimensions. The first dimension (“Satisfaction with the multidisciplinary team”) included questions related to the nursing team and other health professionals, which shows that the patients were not able to separate the nursing staff from the other health professionals involved in their care during hospitalization, in contrast to results obtained in other countries [9, 16]. We expected that, because we had different labor classes in the nursing team, nursing technician and nurse (upper level), we would have a difference and probable separation in the corresponding dimension in the questionnaire. However, the result was an absence of differentiation among nursing technicians, nurses, and other hospital professionals who work directly with the patient, such as laboratory technicians, biologists, psychologists, physiotherapists, and others. It is

worth noting that the question of satisfaction in general (question 32), remained in this dimension, demonstrating the relevance of this multidisciplinary team to the overall evaluation of satisfaction.

The issues related to satisfaction with medical care remained separate from those related to other health professionals. This fact reinforces that doctors in Brazil are seen as a separate category and that patients see them outside of hospital care, relating them to the process of diagnosis and cure of the disease. This distinction of doctors within the health team was evidenced in previous studies, in which other health professionals declared a process of discrimination/disqualification on the part of the doctors. The doctor has been highlighted by other health professionals as the one who receives the patient, diagnoses him, formulates the therapeutic plan, and

directs him to the necessary treatments. In this process, doctors are identified as resistant to teamwork and centralizing actions [21].

Previous studies have reinforced the need for teamwork for comprehensive health actions [22]. It is observed that greater integration occurs in the team in situations where there is greater equality between the different jobs and the professionals involved. Therefore, there is a need to make the division of labor more flexible while maintaining the specialties of each area [23]. Some questions, particularly 25 and 29, presented lower values of factorial load, reinforcing deficits in exchange of information and patients' difficulties accessing the hospital.

In the redistribution of dimensions, it is also worth noting that discharge from the hospital was an isolated dimension, with a single item. This emphasis on hospital discharge reinforces its relevance and the expectations of patients when they leave the hospital and return home.

All the subscales and dimensions formed presented reliable results between the items and validated the test–retest step. As in the work of Hjörleifsdóttir et al. [16], there was a significant correlation between items ($p < 0.001$) and the sample was considered adequate by the Kaiser–Meyer–Olkin index, with 0.937 in the above-mentioned authors' work and 0.949 in the present study. In addition, the results presented here support the reliability and internal consistency of the sub-scales and dimensions, confirming the psychometric properties of the questionnaire in the Brazilian version, as all items and dimensions presented a Cronbach's alpha score above 0.7. The same did not occur in studies carried out in Spain and Sri Lanka [18, 15 respectively], which highlighted access to the hospital as a related but conceptually different item. Some patients understood during the interview that access to the hospital is not their responsibility, but this was not reflected in the results.

Conclusion

The EORTC IN-PATSAT32 questionnaire demonstrated psychometric properties when applied in a sample of Brazilian patients with different types of tumor and in different stages of treatment, attended at a public hospital in Rio de Janeiro, Brazil. Our results are in agreement with the literature and the EORTC proposals. EORTC IN-PATSAT32 proved to be an adequate instrument to be used in Brazilian hospitals to measure the satisfaction of hospitalized patients.

Compliance with ethical standards

Conflict of interest We do not have a financial relationship with the organization that sponsored the research or authorship. We have full control of all primary data and we agree to allow the journal to review our data if necessary.

Ethical statement The project was approved by the INCA Ethics Committee.

Informed consent Participants signed the free and informed consent terms (TCLE).

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