

## An international prospective study of the EORTC cancer in-patient satisfaction with care measure (EORTC IN-PATSAT32)

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### Abstract

Little is known about patients' satisfaction with care in oncology hospitals across cultural contexts. Within the EORTC, we developed a 32-item satisfaction with care questionnaire to measure patients' appraisal of hospital doctors and nurses, as well as aspects of care organisation and services. This study assessed the psychometric characteristics of the questionnaire, the EORTC IN-PATSAT32, in a large, international sample of patients with cancer. Patients discharged from a surgery or medical oncology ward in nine countries were invited to complete at home the EORTC IN-PATSAT32 as well as other instruments for psychometric testing. Of 762 eligible patients recruited, 15% failed to return the questionnaire. Of the 647 compliant patients, 63% completed the questionnaires within 15 min and 82% required no help in its completion. Multitrait scaling analysis revealed excellent internal consistency and convergent validity, although some scales within the IN-PATSAT32 were relatively highly correlated. Test–retest data on 113 patients showed high reliability for most scales. Scales of the IN-PATSAT32 and of the QLQ-C30 were not significantly correlated, suggesting that the two questionnaires are assessing quite distinct concepts. The scales of the IN-PATSAT32 were able

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to discriminate clearly between patients with differing care expectations and differing intentions to recommend their hospital to others. This study supports the acceptability to patients, and the psychometric robustness of the EORTC IN-PATSAT32 questionnaire. Further studies are needed to assess the responsiveness of the questionnaire to changes in the structure and process of care over time. © 2005 Elsevier Ltd. All rights reserved.

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## 1. Introduction

In most western countries, governmental health care agencies, professional organizations, and health care insurers are increasingly interested in assessing and monitoring patients' satisfaction with care [1]. Patient satisfaction, or a patient's judgment of care quality, has become recognized as being essential in the definition of quality in health care. Evaluating the extent to which patients are satisfied with health services has considerable clinical relevance; it provides one indication of the degree to which a service meets patients' needs and expectations. Evidence has also emerged that satisfaction is related to patients' adherence to medical recommendations, compliance to cancer treatment regimens [2] and to improvement in health status [3].

Patient satisfaction can be defined as the extent to which an individual's health care experiences match his or her expectations [4]. It can be broadly thought to refer to all relevant experiences and processes associated with health care delivery.

The majority of patient satisfaction questionnaires have been developed in Anglo-Saxon countries [5–7] and have rarely been validated across countries and cultures. Thus the availability of means of making cross-national comparisons of the perceived quality of health care services is very limited. The European Organisation for Research and Treatment of Cancer (EORTC) Quality of Life Group has developed a questionnaire, the EORTC IN-PATSAT32, for assessing cancer patients' perception of the quality of hospital-based care. The objective of the present study was to assess the psychometric properties of the EORTC IN-PATSAT32 when used in a large, international, cross-cultural context.

## 2. Patients and methods

This study began in May 2002 and was completed in June 2004. It was coordinated at the Quality of Life Unit of the EORTC Data Centre in Brussels (Protocol 15012). Informed consent and local or national ethical committee approval was obtained.

### 2.1. Patients

Patients had to be diagnosed with cancer, be aged 18 years or older, have been hospitalised for at least

three days, and be mentally fit to complete a questionnaire. At registration, patients were stratified into four distinct patient groups formed on the basis of age (less than 50 versus 50 years of age or older) and hospitalisation ward (medical oncology versus surgery), the aim being to obtain an equivalent patient number per group. Collaborating hospitals were drawn from the following geographical/linguistic categories: Anglo-Saxon, Northern Europe, Central Europe, Southern Europe and Asia.

### 2.2. Questionnaires and data collection

Patients were asked to complete the EORTC core quality of life questionnaire, the QLQ-C30 (version 3.0) [8], the patient satisfaction questionnaire, the EORTC IN-PATSAT32, the Oberst patients' perception of care quality and satisfaction scale [9], an item investigating the intention to recommend the hospital/ward to others, and a debriefing form.

The EORTC QLQ-C30 contains scales and items addressing functional aspects of QOL and symptoms that commonly occur in patients with cancer.

The EORTC IN-PATSAT32 is composed of 32 items assessing cancer patients' perception of the quality of hospital doctors and nurses, as well as selected aspects of the care organization and hospital environment that are relevant across country settings. This questionnaire was developed according to the guidelines and procedures recommended by the EORTC QL Group [10]. It is based, in part, on existing patient satisfaction questionnaires, as well as interviews with oncology specialists and cancer patients [11]. Initial psychometric testing carried out in France, Italy, Poland and Sweden provided preliminary data on the questionnaire performance across groups of cancer patients from Northern Europe, Central Europe and Latin countries, and resulted in the EORTC IN-PATSAT32 (quality of care – patient satisfaction 32 items) [12,13].

A “poor”, “fair”, “good”, “very good” or “excellent” response scale is used to rate each aspect of care. This type of response scale has been shown to have methodological advantages over other types of response scales [14]. All scores are linearly transformed to a 0–100 scale. A higher score reflects a higher level of satisfaction. The EORTC IN-PATSAT32 has been translated into Dutch, English, French, German, Icelandic, Italian, Norwegian, Polish, Spanish, Swedish, Taiwanese, and

Turkish according to guidelines established by the EORTC Quality of Life Group [15].

The Oberst patients' perception of care quality and satisfaction scale consists of five 10-cm visual analogue single-item scales measuring the quality of medical care, quality of nursing care, extent to which expectations of care have been met, and on the adequacy of diagnostic-treatment information and self-care information [9]. These five scales have end-point descriptors. An additional item addresses the patient's intention to recommend the oncology hospital or department attended to others.

A standard EORTC debriefing questionnaire was used to record the time required to complete the EORTC QLQ-C30 and the EORTC IN-PATSAT32 questionnaires, the need for assistance and the presence of questionnaire items that were considered confusing, difficult to answer or upsetting.

Patients were contacted before their discharge from hospital, were informed of the objectives and procedures of the study, and solicited to participate. All questionnaires were distributed in hospital, for completion at home within six weeks of hospital discharge. Completed questionnaires were to be mailed back to the participating centre coordinator using a pre-addressed pre-stamped envelope. A reminder letter was sent if the questionnaire was not returned and, where necessary, was followed by a telephone reminder.

For purposes of assessing the test–retest reliability of the EORTC IN-PATSAT32, a consecutive sample of 100 patients was recruited from one centre (Institut Curie, France). The second assessment was planned approximately two weeks after the first assessment. Compliance with data collection was monitored according to standard EORTC procedures.

### 2.3. Defining the EORTC IN-PATSAT32 scales and items

The EORTC IN-PATSAT32 was conceptualised as containing eleven multi-item and 3 single-item scales. These include the doctors' technical skills (items 31–33), interpersonal skills (items 34–36), information provision (items 37–39), availability (items 40, 41) scales; the nurses' technical skills (items 42–44), interpersonal skills (item 45–47), information provision (items 48–50), availability (items 51, 52) scales; the other hospital staff interpersonal skills and information provision scale (items 54–56); the exchange of information single-item scale (item 53); the waiting time scale (items 57, 58); the hospital access scale (items 59, 60); the comfort single-item scale (item 61); and the general satisfaction single-item scale (item 62) (Appendix A).

Multi-trait scaling analyses were used to examine whether the individual items of the EORTC IN-PATSAT32 could be aggregated as hypothesized into a more

limited set of multi-item scales. This technique is based on an examination of item–scale correlations. Evidence of item convergent validity was defined as a correlation of  $>0.40$  (corrected for overlap) between an item and its own scale. Item discriminant validity was supported and a scaling success counted whenever the correlation between an item and its hypothesized scale (corrected for overlap) was more than two standard errors higher than its correlation with other scales.

### 2.4. Reliability

Reliability was tested by assessing the scale internal consistency and reproducibility (test–retest). Internal consistency was calculated using Cronbach's alpha coefficients for each scale. Values of above 0.7 are generally regarded as acceptable and over 0.8 as good for purposes of group comparisons [16]. The test–retest reliability of the scales was assessed using the intra-class correlation coefficient (ICC) or Cohen's Kappa.

### 2.5. Validity

Three approaches were taken to evaluate the validity of the EORTC IN-PATSAT32. The first approach involved examination of the relationship between scales and single items of the EORTC IN-PATSAT32 and the Oberst patients' perception of care quality and satisfaction scales, using Pearson's product moment correlations. It was expected that those scales that are conceptually related (e.g. the EORTC IN-PATSAT32 information provision items and the Oberst information visual analogue scale) would correlate substantially with one another (Pearson's  $r > 0.40$ ). Conversely, those scales with less in common (e.g. the EORTC IN-PATSAT32 doctor's technical skills items and the Oberst quality of nursing care visual analogue scale) were expected to exhibit lower correlations (Pearson's  $r < 0.40$ ).

In the second approach, divergent validity was checked by assessing the relationship between the EORTC IN-PATSAT32 and the EORTC QLQ-C30 scales and single items. Patient satisfaction and quality of life are intended to assess distinct concepts; their scales and items should evidence lower correlation (Pearson's  $r < 0.40$ ).

In the third approach, the ability of the questionnaire to discriminate between 'extreme groups' was assessed by comparing patient groups that were expected to differ strongly in terms of satisfaction scores [17]. Groups were formed based on the following factors: age, education level, patients' expectations, intention to recommend the hospital or ward, treatment-related toxicity (whether patient had any grade 3 or 4 surgery-, chemotherapy- or radiotherapy related toxicities according to CTC toxicities scale), and participation in a clinical trial. A higher satisfaction level was expected

for older patients, patients with a lower level of education, those with lower expectations, those who would recommend the hospital or ward attended, those with less treatment-related toxicity, and those being treated in the context of a clinical trial. Group differences were tested for statistical significance using the two-sided Wilcoxon rank test. A *P* value of 0.05 or less was used to define statistical significance. Effect sizes were computed to provide an indication of the magnitude of difference between group scores. These were calculated by dividing the mean score difference between groups by the pooled standard deviation. Effect sizes of 0.2 are considered small, 0.5 of moderate and 0.8 of large [18]. The statistical software used for all analyses was SAS version 8.02 [19].

### 3. Results

#### 3.1. Patient characteristics and compliance

794 patients from 9 countries were entered into the study of whom, 762 met all eligibility criteria. Of these 762 patients, 115 (15%) did not complete the questionnaires. The main reasons provided for non-participation were feeling too ill (23), death (14), perception of inconvenience (9) and concerns about confidentiality (2). Respondents and non-respondents did not differ significantly in terms of age, gender, education level or time since diagnosis. However they differed significantly in type of current (or planned) treatment, and centre.

Table 1 displays the socio-demographic and clinical characteristics of the sample. The median age of the sample was 57 years (range 19–91), 382 (59%) were female, and 311 (52%) had more than a compulsory educational level. The sample was organized into 4 subgroups: group 1 included 91 (14%) patients attending a surgery ward and aged less than 50; group 2, 281 (43%) patients attending a surgery ward and aged 50 or above; group 3, 114 (18%) patients attending a medical ward and aged less than 50; and group 4, 161 (25%) patients attending a medical ward and aged 50 or above.

#### 3.2. Questionnaire acceptability

The majority of patients (63%) completed the EORTC QLQ-C30 and EORTC IN-PATSAT32 within 15 min, and 82% required no assistance in doing so. Age was not found to strongly influence the time needed for filling in the questionnaire ( $r = 0.22$ ). However there was a strong effect of age on the report of request for help. Older patients requested help significantly more frequently (median age for those who needed help = 63 versus 55 for those who did not;  $P < 0.001$ ). The median

Table 1  
Socio-demographic and clinical characteristics of the sample ( $n = 647$  patients)

	Respondents	
	<i>n</i>	(%)
<i>Country</i>		
Belgium	5	0.8
France	348	53.8
Germany	34	5.2
Italy	53	8.2
Poland	13	2
Spain	24	3.7
Sweden	49	7.6
Taiwan	87	13.4
United Kingdom	34	5.2
<i>Age</i>		
Median	57	
Range	19–91	
<i>Gender</i>		
Male	265	41
Female	382	59
<i>Highest level of education</i>		
Less than compulsory	65	10
Compulsory school	246	38
Post-compulsory school	193	29.8
University level	136	21
Unknown	7	1.1
<i>Cohabitants</i>		
Alone	108	16.7
Family	481	74.3
Other adults	57	8.8
Unknown	1	0.2
<i>Marital status</i>		
Single	86	13.3
Married, cohabitant	476	73.6
Separated, divorced, widow(er)	83	12.8
Unknown	2	0.3
<i>Employment status</i>		
Full time	262	40.5
Part time	31	4.8
Homemaker	51	7.9
Student	10	1.5
Unemployed	32	4.9
Retired	253	39.1
<i>Anatomical location of disease</i>		
Respiratory	36	5.6
Gastro-intestinal	111	17.2
Genito-urinary	46	7.1
Gynaecologic	65	10
Head and neck	47	7.3
Breast	227	35.1
Brain	10	1.5
Melanoma	5	0.8
Haematological	42	6.5
Bone	18	2.8
Other	40	6.2
<i>Time since diagnosis (weeks)</i>		
Median	15	
Range	3–1298	

(continued on next page)

Table 1 (continued)

	Respondents	
	n	(%)
<i>Known current disease status</i>		
Local/loco-regional	478	73.9
Metastatic	168	26
Missing	1	0.2
<i>Ward setting</i>		
Surgical ward	372	57.5
Medical ward	275	42.5
<i>Current or planned treatment</i>		
Surgery	356	55
Chemotherapy	264	40.8
Surgery and chemotherapy	21	3.2
Other	6	0.9

percentage of item omission was 2% (range: 1–6%). The item with the highest percentage of missing values was “The waiting time for obtaining results of medical tests” (6%). Nine items (items 31, 32, 33, 36, 38, 39, 53, 57, 58) were commented upon by 6 to 19 patients. Examples of patients’ comments included: (1) the aspect of care was not needed (e.g. comfort and support) or had not been received (e.g. information); (2) the aspect of care was difficult to judge (e.g. doctors’ technical skills); (3) I simply trusted the care provided by doctors/nurses; and (4) I am concerned about the confidentiality of my response.

### 3.3. Multitrait scaling analysis and internal consistency

Multitrait scaling analysis was performed on the 14 hypothesized scales of the IN-PATSAT32. For each patient group and for all scales, item–scale correlations (corrected for overlap) exceeded the 0.40 criterion for item–convergent validity and no item correlated more highly with another scale than with its own scale. Except for the hospital access scale ( $\alpha = 0.67$ ), the internal consistency of all IN-PATSAT32 scales proved good to excellent, with Cronbach’s alpha coefficients ranging from 0.80 to 0.96 (Table 2).

### 3.4. Scales descriptive statistics

The hospital access scale evidenced the lowest mean satisfaction score (50) and the nurses’ technical skills scale the highest (76) (Table 3). The percentage of respondents at ceiling was also lowest for the hospital access scale (5.6%) and highest for the nurses’ technical skills scale (27.8%). The observed standard deviations were fairly large, ranging from 19.6 (doctors’ technical skills scale) to 27.2 (hospital comfort scale). Scores of the IN-PATSAT32 scales demonstrated very close to normal distribution with Shapiro–Wilk estimates ranging from 0.84 to 0.97.

### 3.5. Inter-scale correlation

For the total sample, relatively high inter-scale correlations were observed between both the doctors’ and the nurses’ sub-scales. Also, the satisfaction with other personnel scale correlated highly with the exchange of information between caregivers and waiting time scales, and with the single item assessing overall care quality (Table 4).

### 3.6. Test–retest reliability

The differences observed between satisfaction ratings provided at the initial administration versus the readministration of the questionnaire were small. The largest differences were found for the scale assessing doctors’ information provision, with a 2.55 point higher mean rating on the retest questionnaire. The intraclass correlations coefficients (ICCs) for the IN-PATSAT32 scales were all above 0.70. The ICC for the single general satisfaction item was 0.66 (Table 4).

### 3.7. Relationship between the IN-PATSAT32 and the QLQ-C30, the Oberst perception of care quality and satisfaction, and the intention to recommend the hospital item

None of the scales and single items of the IN-PATSAT32 correlated highly with the QLQ-C30. The highest observed correlation was between the global quality of life scale of the QLQ-C30 and the general satisfaction item of the IN-PATSAT32 ( $r = 0.21$ ).

Correlations between the IN-PATSAT32 and the Oberst perception of care quality and satisfaction scales and the intention to recommend the hospital item, computed for the 594 patients who completed the Oberst scales, were moderate, ranging from  $-0.21$  (IN-PATSAT32 access scale and Oberst information on illness and treatment scale) to  $-0.61$  (IN-PATSAT32 doctors’ information provision scale and Oberst information on illness and treatment scale). The highest correlations, as expected, were between the IN-PATSAT32 doctors’ scales and the Oberst scales assessing medical care and information provided on illness and treatment; the IN-PATSAT32 nurses’ scales and the Oberst satisfaction with nursing care scale; the IN-PATSAT32 satisfaction with other personnel and general satisfaction scale and all Oberst scales and the intention to recommend the hospital item.

### 3.8. Validity – extreme group comparisons

The IN-PATSAT32 scales were able to discriminate clearly between patients whose care expectations were highly met and patients whose care expectations were fairly met or not met at all ( $P < 0.001$ ), as well as be-



Table 2

Item convergent validity, item discriminant validity and scale internal consistency per patient group

IN-PATSAT32 scales	Surgery ward, age less than 50 ( <i>n</i> = 91)			Surgery ward, age 50 or more ( <i>n</i> = 281)			Medical ward, age less than 50 ( <i>n</i> = 114)			Medical ward, age 50 or more ( <i>n</i> = 161)		
	Con	Dis	$\alpha$	Con	Dis	$\alpha$	Con	Dis	$\alpha$	Con	Dis	$\alpha$
SATDTS	0.84–0.91	0.64–0.77	0.87	0.84–0.91	0.55–0.75	0.85	0.85–0.93	0.46–0.68	0.86	0.86–0.91	0.61–0.77	0.87
SATDIS	0.92–0.95	0.60–0.84	0.93	0.93–0.95	0.57–0.78	0.94	0.90–0.94	0.46–0.78	0.92	0.89–0.95	0.63–0.78	0.91
SATDIP	0.90–0.93	0.59–0.75	0.90	0.92–0.94	0.52–0.70	0.93	0.93–0.95	0.53–0.75	0.94	0.92–0.94	0.59–0.72	0.93
SATDAV	0.93–0.93	0.58–0.77	0.86	0.94–0.95	0.44–0.75	0.88	0.93–0.94	0.33–0.75	0.88	0.95–0.96	0.57–0.69	0.91
SATNTS	0.89–0.93	0.65–0.83	0.91	0.90–0.95	0.65–0.84	0.92	0.89–0.91	0.66–0.76	0.90	0.93–0.97	0.66–0.88	0.94
SATNIS	0.90–0.96	0.65–0.90	0.93	0.87–0.95	0.72–0.87	0.92	0.86–0.94	0.68–0.83	0.90	0.89–0.94	0.60–0.89	0.92
SATNIP	0.92–0.95	0.60–0.73	0.94	0.96–0.96	0.64–0.75	0.96	0.96–0.96	0.55–0.71	0.96	0.94–0.96	0.59–0.82	0.95
SATNAV	0.91–0.92	0.64–0.87	0.83	0.96–0.96	0.63–0.78	0.92	0.92–0.93	0.60–0.79	0.85	0.93–0.93	0.68–0.76	0.86
SATEXE	–	0.06–0.64	–	–	0.23–0.69	–	–	0.20–0.68	–	–	0.41–0.76	–
SATOTH	0.87–0.89	0.27–0.71	0.87	0.90–0.93	0.28–0.73	0.90	0.82–0.91	0.33–0.73	0.86	0.83–0.92	0.41–0.79	0.88
SATWAI	0.89–0.92	0.24–0.64	0.80	0.92–0.93	0.28–0.67	0.84	0.91–0.92	0.34–0.69	0.82	0.92–0.92	0.52–0.74	0.83
SATACC	0.78–0.86	0.23–0.49	0.56	0.85–0.89	0.40–0.54	0.71	0.82–0.87	0.35–0.45	0.65	0.84–0.88	0.41–0.59	0.67
SATCOM	–	0.30–0.54	–	–	0.38–0.56	–	–	0.20–0.49	–	–	0.31–0.58	–
SATGEN	–	0.29–0.64	–	–	0.23–0.70	–	–	0.26–0.73	–	–	0.33–0.65	–

Con = the range of item–scale correlation (corrected for overlap). Dis = the range of correlation between an item and other scales.  $\alpha$  = Cronbach's alpha coefficient.

QLQ-SAT32 scales: SATDTS = doctors technical skills, SATDIS = doctors interpersonal skills, SATDIP = doctors information provision, SATDAV = doctors availability, SATNTS = nurses technical skills, SATNIS = nurses interpersonal skills, SATNIP = nurses information provision, SATNAV = nurses availability, SATEXE = exchange of information between caregivers, SATOTH = other personal interpersonal skills and information provision, SATWAI = waiting time, SATACC = access, SATCOM = comfort, SATGEN = overall quality rating.

Table 3

IN-PATSAT32 scales descriptive statistics (*n* = 647 patients)

IN-PATSAT32 scales	Mean	Standard deviation	<i>n</i> (%) floor	<i>n</i> (%) ceiling	Normality
SATDTS	75.84	19.59	2 (0.3)	144 (22.3)	0.92
SATDIS	69.33	24.47	7 (1.1)	130 (20.2)	0.93
SATDIP	65.38	25.57	14 (2.2)	109 (16.8)	0.95
SATDAV	64.89	25.37	15 (2.3)	111 (17.2)	0.94
SATNTS	76.19	20.76	1 (0.2)	180 (27.8)	0.90
SATNIS	74.97	21.94	4 (0.6)	173 (26.7)	0.91
SATNIP	65.87	24.51	8 (1.2)	118 (18.2)	0.93
SATNAV	70.75	23.39	4 (0.6)	150 (23.2)	0.92
SATEXE	64.64	24.85	14 (2.2)	117 (18.1)	0.89
SATOTH	68.73	22.46	1 (0.2)	110 (17.0)	0.94
SATWAI	62.04	23.60	8 (1.2)	82 (12.7)	0.95
SATACC	50.06	24.74	24 (3.7)	36 (5.6)	0.97
SATCOM	67.86	27.22	24 (3.7)	173 (26.7)	0.88
SATGEN	75.59	20.78	0 (0.0)	206 (31.8)	0.84

% floor = percentage of respondents at lowest scale rating. % ceiling = percentage of respondents at highest scale rating. Normality is assessed by Shapiro–Wilk statistic: all scales are very close to normal distribution.

IN-PATSAT32 scales: SATDTS = doctors technical skills, SATDIS = doctors interpersonal skills, SATDIP = doctors information provision, SATDAV = doctors availability, SATNTS = nurses technical skills, SATNIS = nurses interpersonal skills, SATNIP = nurses information provision, SATNAV = nurses availability, SATEXE = exchange of information between caregivers, SATOTH = other personal interpersonal skills and information provision, SATWAI = waiting time, SATACC = access, SATCOM = comfort, SATGEN = overall quality rating.

tween patients with different levels of intention to recommend the hospital to others ( $P < 0.001$ ) (Table 5). Effect sizes were moderate ( $\geq 0.5$ ) in 23 of 28 comparisons, and large ( $\geq 0.8$ ) in five comparisons. Additionally, the IN-PATSAT32 waiting time, other hospital staff interpersonal skills and information provision, and general satisfaction scales were able to discriminate between patients with low versus high treatment-related toxicity ( $P < 0.001$ ). Effect sizes were small ( $\geq 0.2$ ) in 8 scales, moderate in 2 scales and insignificant in 4 scales. How-

ever, none of the IN-PATSAT32 scales were able to discriminate between patients in terms of age categories (cut-off at the sample median age of 57) or participation in a clinical trial, and only the satisfaction with the hospital comfort scale could discriminate between patients in terms of levels of education (compulsory education: less versus above). For age and education level, effect sizes were insignificant for most of the scales and for participation in clinical trial, effect sizes were small in 9 scales and insignificant in five scales.

Table 4

Inter-scale Pearson's correlation matrices and test–retest intra-class coefficients ( $N = 647$  patients)

SCALE	satdts	satdis	satdip	satdav	satnts	satnis	satnip	satnav	satexc	satoth	satwai	satacc	satcom	satgen
SATDTS	(0.70)													
SATDIS	0.76	(0.74)												
SATDIP	0.68	0.72	(0.77)											
SATDAV	0.63	0.76	0.71	(0.77)										
SATNTS	0.56	0.50	0.49	0.46	(0.85)									
SATNIS	0.47	0.50	0.45	0.40	0.86	(0.82)								
SATNIP	0.48	0.53	0.60	0.47	0.74	0.77	(0.75)							
SATNAV	0.47	0.47	0.45	0.44	0.77	0.82	0.73	(0.78)						
SATEXC	0.48	0.49	0.52	0.47	0.60	0.63	0.68	0.65	(0.72)					
SATOTH	0.55	0.53	0.58	0.49	0.65	0.63	0.70	0.65	0.73	(0.80)				
SATWAI	0.51	0.51	0.60	0.54	0.53	0.52	0.58	0.57	0.64	0.71	(0.73)			
SATACC	0.30	0.34	0.31	0.34	0.39	0.38	0.38	0.37	0.39	0.47	0.48	(0.78)		
SATCOM	0.31	0.33	0.31	0.35	0.38	0.38	0.36	0.39	0.40	0.52	0.46	0.48	(0.74)	
SATGEN	0.55	0.50	0.53	0.49	0.65	0.66	0.62	0.64	0.65	0.72	0.61	0.40	0.53	(0.66)

IN-PATSAT32 scales: SATDTS = doctors technical skills, SATDIS = doctors interpersonal skills, SATDIP = doctors information provision, SATDAV = doctors availability, SATNTS = nurses technical skills, SATNIS = nurses interpersonal skills, SATNIP = nurses information provision, SATNAV = nurses availability, SATEXE = exchange of information between caregivers, SATOTH = other personal interpersonal skills and information provision, SATWAI = waiting time, SATACC = access, SATCOM = comfort, SATGEN = overall quality rating.

Figures in the diagonal and in parenthesis correspond to the test–retest intra-class coefficients.

#### 4. Discussion

This international validation study was conducted to document the psychometric properties of the EORTC IN-PATSAT32, a questionnaire designed to assess cancer patients' perception of the quality of medical care, nursing care and care organisation and services received in the hospital. The overall results provide support for the reliability and validity of the questionnaire when used in a large and culturally diverse sample of hospitalized cancer patients.

The EORTC IN-PATSAT32 is designed to elicit information from patients in order to better understand potential problem areas in health care delivery, and to feed into the monitoring, planning and improvement of services and care. To our knowledge, only three other patient satisfaction questionnaires have been developed specifically for cancer patients [9,20–22]. However none of these instruments was developed in a cross-cultural context, thus limiting their usefulness in comparing levels of satisfaction across countries and cultures.

The high response rate, low missing item rate, and the low number of comments regarding individual items indicate that the IN-PATSAT32 is well accepted by patients. Most patients completed the QLQ-C30 and IN-PATSAT32 in less than 15 min, and of the 16% patients who needed help filling it out, only 6 indicated difficulty in understanding specific items.

Multi-trait scaling analyses indicated high convergent validity and internal consistency, and acceptable discriminant validity of the IN-PATSAT32 scales. The access scale, however, yielded a lower internal consistency estimate. This scale, which contains two related but conceptually different items (*i.e.* ease of access by means of

transport and parking; ease in finding one's way within the hospital) might best be handled separately.

The distribution of the IN-PATSAT32 scale scores was close to normal and evidenced fairly large score variability. Test–retest reliability was acceptable.

The IN-PATSAT32 did not correlate significantly with the EORTC QLQ-C30, suggesting that the former questionnaire is assessing conceptually different issues (*i.e.* patient satisfaction) than the latter questionnaire (*i.e.* patients' functioning and symptom experience) [23].

As expected, moderate correlations were observed between the IN-PATSAT32 scales and the Oberst perception of care quality and satisfaction scales and the intention to recommend the hospital item. Additionally, the various scales of IN-PATSAT32 were able to discriminate clearly between patients who differed in terms of care expectations or intention to recommend the hospital to others, and to a lesser degree between patients experiencing low versus high treatment-related toxicity. However, none of the IN-PATSAT32 scales were able to discriminate between patient groups formed on the basis of age or level of education. This contrasts with other reports in the literature that indicate that satisfaction levels often vary significantly as a function of these socio-demographic variables [24–26]. This may be due, in part, to the fact that our sample was relatively young and well educated.

Relatively high correlations were observed between scales assessing various areas of satisfaction with both doctors and nurses. The hypothesized scale structure of the IN-PATSAT32 had been established on the basis of exploratory factor analyses [12]. Although these high inter-scale correlations suggest that patients' ratings of the care provided by their doctors and nurses form an overall gestalt, it may still be useful to generate scores

Table 5

Validity – extreme group comparisons of mean scores (standard deviations) for scales and single items in the IN-PATSAT32 ( $n = 647$  patients)

IN-PATSAT32 scales	Age				Education			
	Less than 57 ( $n = 319$ )	57 or above ( $n = 328$ )	$P$ value (Wilcoxon test)	Effect size	Less than compulsory ( $n = 311$ )	Post-compulsory ( $n = 329$ )	$P$ value (Wilcoxon test)	Effect size
SATDTS	75.24 (19.88)	76.44 (19.31)	0.39	−0.06	75.77 (19.28)	75.87 (19.75)	0.95	−0.01
SATDIS	68.03 (24.81)	70.64 (24.09)	0.19	−0.11	71.37 (23.23)	67.46 (25.44)	0.07	0.16
SATDIP	63.02 (26.10)	67.75 (24.84)	0.03	−0.19	65.46 (24.62)	65.11 (26.43)	0.92	0.01
SATDAV	62.50 (25.62)	67.25 (24.94)	0.02	−0.19	65.89 (24.68)	63.88 (26.07)	0.31	0.08
SATNTS	75.26 (20.40)	77.12 (21.09)	0.16	−0.09	76.70 (20.16)	75.64 (21.41)	0.66	0.05
SATNIS	74.52 (21.63)	75.42 (22.26)	0.44	−0.04	76.87 (21.38)	73.29 (22.38)	0.04	0.16
SATNIP	74.52 (21.63)	75.42 (22.26)	0.58	−0.05	67.51 (23.78)	64.41 (25.13)	0.13	0.13
SATNAV	70.01 (22.73)	71.48 (24.05)	0.28	−0.06	72.37 (22.71)	69.34 (23.81)	0.13	0.13
SATEXE	63.47 (26.02)	65.82 (23.60)	0.33	−0.09	65.67 (24.62)	63.41 (25.09)	0.27	0.09
SATOTH	67.69 (22.20)	69.76 (22.70)	0.19	−0.09	70.14 (22.04)	67.07 (22.81)	0.08	0.14
SATWAI	59.73 (22.65)	64.35 (24.34)	0.01	−0.20	61.99 (22.85)	61.72 (24.19)	0.80	0.01
SATACC	49.20 (24.28)	50.90 (25.19)	0.34	−0.07	50.41 (25.08)	49.61 (24.31)	0.65	0.03
SATCOM	65.56 (27.14)	70.11 (27.15)	0.02	−0.17	70.89 (27.54)	64.88 (26.62)	0.002	0.22
SATGEN	74.53 (20.31)	76.64 (21.21)	0.12	−0.10	76.73 (20.59)	74.38 (20.96)	0.16	0.11

  

IN-PATSAT32 scales	Expectations				Intention to recommend hospital						
	Highly met ( $n = 369$ )	Fair to not at all ( $n = 278$ )	$P$ value (Wilcoxon test)	Effect size	Strongly disagree ( $n = 2$ )	Disagree ( $n = 5$ )	Neither ( $n = 31$ )	Agree ( $n = 183$ )	Strongly agree ( $n = 408$ )	$P$ value (Wilcoxon test)	Effect size (Strongly agree versus others)
SATDTS	80.00 (19.12)	70.45 (18.90)	<0.001	0.49	87.50 (17.68)	48.33 (16.03)	56.11 (23.97)	66.81 (18.62)	81.55 (16.92)	<0.001	−0.84
SATDIS	75.58 (23.44)	61.18 (23.41)	<0.001	0.59	95.83 (5.89)	43.33 (36.04)	45.70 (29.65)	61.27 (23.14)	74.88 (22.21)	<0.001	−0.65
SATDIP	71.46 (25.02)	57.44 (24.10)	<0.001	0.55	87.50 (17.68)	45.00 (34.66)	44.09 (29.91)	56.62 (24.58)	71.22 (23.39)	<0.001	−0.64
SATDAV	70.82 (25.09)	57.13 (23.62)	<0.001	0.54	100.00 (0.00)	50.00 (30.62)	41.94 (25.53)	55.83 (22.86)	70.59 (24.23)	<0.001	−0.65
SATNTS	80.65 (19.42)	70.35 (21.03)	<0.001	0.50	100.00 (0.00)	36.67 (35.16)	61.02 (18.18)	67.68 (20.37)	81.80 (18.39)	<0.001	−0.75
SATNIS	80.80 (19.69)	67.42 (22.42)	<0.001	0.61	100.00 (0.00)	38.33 (38.01)	56.72 (23.32)	66.13 (21.79)	80.93 (18.93)	<0.001	−0.75
SATNIP	71.66 (23.52)	58.21 (23.71)	<0.001	0.55	100.00 (0.00)	30.00 (32.60)	44.54 (20.45)	56.98 (23.90)	71.90 (22.33)	<0.001	−0.69
SATNAV	76.42 (22.34)	63.36 (22.69)	<0.001	0.56	100.00 (0.00)	30.00 (32.60)	44.54 (20.45)	56.98 (23.90)	71.90 (22.33)	<0.001	−0.79
SATEXE	70.48 (24.19)	56.66 (23.53)	<0.001	0.56	87.50 (17.68)	50.00 (35.36)	43.10 (25.79)	53.11 (21.86)	71.51 (22.95)	<0.001	−0.79
SATOTH	75.53 (21.27)	59.72 (20.80)	<0.001	0.70	91.67 (11.79)	46.67 (35.16)	43.15 (22.11)	56.41 (20.36)	76.61 (18.83)	<0.001	−0.98
SATWAI	68.29 (22.29)	53.78 (22.78)	<0.001	0.61	87.50 (17.68)	42.50 (31.37)	36.69 (19.35)	50.90 (20.89)	69.60 (21.16)	<0.001	−0.87
SATACC	68.29 (22.29)	53.78 (22.78)	<0.001	0.54	87.50 (17.68)	22.50 (22.36)	33.33 (25.29)	42.50 (21.94)	55.49 (24.07)	<0.001	−0.58
SATCOM	75.21 (24.01)	58.18 (28.20)	<0.001	0.63	100.00 (0.00)	25.00 (43.30)	34.68 (30.05)	57.01 (25.93)	75.81 (23.03)	<0.001	−0.82
SATGEN	82.25 (18.54)	66.79 (20.32)	<0.001	0.74	100.00 (0.00)	55.00 (27.39)	47.58 (18.66)	64.36 (17.90)	83.21 (17.24)	<0.001	−1.02



(continued on next page)

Table 5 (continued)

IN-PATSAT32 scales	Treatment related toxicity				Participation in clinical trial			
	No (n = 485)	Yes (n = 74)	P value (Wilcoxon test)	Effect size	No (n = 608)	Yes (n = 39)	P value (Wilcoxon test)	
SATDTS	76.13 (19.88)	71.28 (19.51)	0.03	0.25	75.82 (19.44)	76.07 (21.98)	0.66	−0.01
SATDIS	69.56 (24.86)	65.65 (22.28)	0.11	0.16	69.75 (23.95)	63.03 (31.05)	0.30	0.27
SATDIP	66.05 (25.63)	61.04 (25.99)	0.12	0.20	65.46 (25.21)	64.10 (30.90)	0.93	0.05
SATDAV	64.73 (25.74)	62.33 (24.70)	0.44	0.10	65.13 (25.01)	61.22 (30.59)	0.49	0.15
SATNTS	77.00 (20.22)	73.09 (21.57)	0.14	0.19	75.79 (20.83)	82.48 (18.81)	0.06	−0.32
SATNIS	76.09 (21.53)	70.05 (19.70)	0.01	0.28	74.66 (21.92)	79.70 (21.86)	0.11	−0.23
SATNIP	66.78 (24.18)	62.50 (23.38)	0.13	0.17	65.48 (24.61)	71.93 (22.30)	0.10	−0.26
SATNAV	71.72 (23.11)	64.86 (23.01)	0.02	0.29	70.37 (23.57)	76.60 (19.91)	0.13	−0.27
SATEXE	65.92 (24.55)	57.50 (24.58)	0.005	0.34	64.24 (24.61)	70.95 (27.96)	0.07	−0.27
SATOTH	70.59 (22.19)	57.66 (21.80)	<0.001	0.58	68.39 (22.47)	74.12 (21.90)	0.09	−0.26
SATWAI	62.99 (23.39)	57.88 (22.68)	0.07	0.22	61.73 (23.54)	66.78 (24.36)	0.21	−0.21
SATACC	50.79 (25.29)	45.38 (21.20)	0.07	0.22	49.85 (24.56)	53.29 (27.52)	0.39	−0.14
SATCOM	69.08 (27.07)	60.81 (27.16)	0.01	0.30	67.58 (27.28)	72.30 (26.21)	0.35	−0.17
SATGEN	76.94 (20.63)	66.32 (20.62)	<0.001	0.51	75.21 (20.74)	81.58 (20.70)	0.05	−0.31

IN-PATSAT32 scales (high score = high satisfaction rating): SATDTS = doctors technical skills, SATDIS = doctors interpersonal skills, SATDIP = doctors information provision, SATDAV = doctors availability, SATNTS = nurses technical skills, SATNIS = nurses interpersonal skills, SATNIP = nurses information provision, SATNAV = nurses availability, SATEXE = exchange of information between caregivers, SATOTH = other personal interpersonal skills and information provision, SATWAI = waiting time, SATACC = access, SATCOM = comfort,

reflecting satisfaction with specific aspects of health care providers' behaviour. For example, communication skills training may affect behaviours ranging from the provision of information to the demonstration of empathy. To assess the impact of such training, it is useful to maintain a distinction between satisfaction with instrumental versus affective aspects of physician behaviour.

In conclusion, the results of this study support the IN-PATSAT32 in terms of both acceptability to patients and psychometric robustness. The fact that the questionnaire has been developed and tested in a cross-cultural context, facilitates its use both within countries (e.g. at individual centre or at health care system levels), and in multinational, comparative health services research. The IN-PATSAT32 can be used to document levels of satisfaction with important aspects of hospital care, can contribute to our understanding of cultural differences in care experience, and may provide insights into factors that affect patient's willingness to undergo or sustain treatments that are often burdensome and toxic. Future studies are needed to determine the responsiveness of the questionnaire to changes (planned or unplanned) in the structure and process of health care organization and care.

### Conflict of interest statement

None declared.

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### Appendix A. EORTC IN-PATSAT32

We are interested in some things about you and your experience of the care received during your hospital stay. Please answer all the questions yourself by circling the number that best applies to you. There are no 'right' or 'wrong' answers. The information that you provide will remain strictly confidential.

During your hospital stay, how would you rate <i>doctors</i> , in terms of	Poor	Fair	Good	Very good	Excellent
31 Their knowledge and experience of your illness?	1	2	3	4	5
32 The treatment and medical follow-up they provided?	1	2	3	4	5
33 The attention they paid to your physical problems?	1	2	3	4	5
34 Their willingness to listen to all of your concerns?	1	2	3	4	5
35 The interest they showed in you personally?	1	2	3	4	5
36 The comfort and support they gave you?	1	2	3	4	5
37 The information they gave you about your illness?	1	2	3	4	5
38 The information they gave you about your medical tests?	1	2	3	4	5
39 The information they gave you about your treatment?	1	2	3	4	5
40 The frequency of their visits/consultations?	1	2	3	4	5
41 The time they devoted to you during visits/consultations?	1	2	3	4	5

(continued on next page)

## Appendix A (continued)

During your hospital stay, how would you rate <i>nurses</i> , in terms of	Poor	Fair	Good	Very good	Excellent
42 The way they carried out your physical examination (took your temperature, felt your pulse, ...)?	1	2	3	4	5
43 The way they handled your care (gave your medicines, performed intravenous injections, ...)?	1	2	3	4	5
44 The attention they paid to your physical comfort?	1	2	3	4	5
45 The interest they showed in you personally?	1	2	3	4	5
46 The comfort and support they gave you?	1	2	3	4	5
47 Their human qualities (politeness, respect, sensitivity, kindness, patience, ...)?	1	2	3	4	5
48 The information they gave you about your medical tests?	1	2	3	4	5
49 The information they gave you about your care?	1	2	3	4	5
50 The information they gave you about your treatment?	1	2	3	4	5
51 Their promptness in answering your buzzer calls?	1	2	3	4	5
52 The time they devoted to you?	1	2	3	4	5
During your hospital stay, how would you rate <i>services and care organisation</i> , in terms of	Poor	Fair	Good	Very good	Excellent
53 The exchange of information between caregivers?	1	2	3	4	5
54 The kindness and helpfulness of the technical, reception, laboratory personnel, ...?	1	2	3	4	5
55 The information provided on your admission to the hospital?	1	2	3	4	5
56 The information provided on your discharge from the hospital?	1	2	3	4	5
57 The waiting time for obtaining results of medical tests?	1	2	3	4	5
58 The speed of implementing medical tests and/or treatments?	1	2	3	4	5
59 The ease of access (parking, means of transport, ...)?	1	2	3	4	5
60 The ease of finding one's way to the different departments?	1	2	3	4	5
61 The environment of the building (cleanness, spaciousness, calmness, ...)?	1	2	3	4	5
Overall	1	2	3	4	5
62 How would you rate the care received during your hospital stay?	1	2	3	4	5

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