

Review

Quality of care in the oncology outpatient setting from patients' perspective: a systematic review of questionnaires' content and psychometric performance

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Abstract

Background: Cancer care is increasingly provided in the outpatient setting, requiring specific monitoring of care quality. The patients' perspective is an important indicator of care quality and needs to be assessed with well designed, psychometrically sound questionnaires. We performed a systematic literature review of currently available patient satisfaction measures for use in cancer outpatient care settings.

Methods: We carried out MEDLINE/PubMed, PsycINFO, CINAHL, and Scopus searches of papers published over the past 15 years that describe cancer patient satisfaction questionnaires for use in the outpatient setting. We used the adapted COSMIN checklist to assess the quality of the questionnaires' measurement properties.

Results: A total of 6677 citations were identified and 76 relevant articles were read, of which 55 were found either not to be relevant or to provide insufficient psychometric information. The remaining 21 studies pertained to 14 patient satisfaction questionnaires. Continuity and transition, accessibility, and involvement of family/friends were less frequently addressed despite their relevance in outpatient oncology. Almost half of the psychometric studies did not provide information on item level missing data. Most internal consistency estimates (Cronbach's α) were satisfactory. Few studies reported test–retest assessment ($n = 5$), used confirmatory factor analysis ($n = 2$), or assessed fit to a graded response item response theory model ($n = 3$). Only three questionnaires were cross-culturally validated.

Conclusion: Important aspects of care may be missed by current patient satisfaction questionnaires for use in the cancer outpatient setting. Additional evidence is needed of their psychometric performance, especially for cross-cultural comparative assessments.

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Introduction

Cancer treatments have become increasingly complex, extended in time, involving different health care providers (HCPs) and settings within hospitals, home, or community care. As a result, there is a potential for care discontinuity [1], deficiencies in care access [2] and coordination [3], or inadequate response to overall care needs [4]. The necessity to improve the quality of cancer care delivery has been recognized internationally, including USA [5,6], UK [7], Australia [8], and France [9].

The patients' perspective on the quality of care received is commonly assessed by patient satisfaction or experience instruments. Patient satisfaction is defined as 'health care recipients' reaction to salient aspects of the context,

process and result of their experience' [10]. While patient satisfaction implies a judgment on care (ratings of care), patient experience reflects 'feedback from patients on what actually happened in the course of receiving care or treatment' (reports of care) [11]. Both concepts are related and multidimensional. Different frameworks underlie the elements of care addressed by these notions such as Donabedian's quality assessment of the structure, the process of care, and its resulting outcome [12] and the taxonomy of medical care of Ware *et al.* including interpersonal manner, technical quality, accessibility/convenience, cost, continuity, physical environment, and availability of care [13]. Gerteis *et al.* identified six dimensions of patient-centered care, including respect for patients' values, preferences, and expressed needs; emotional support; physical

comfort; information and education; coordination and integration; and attention to family and friends [14]. Evaluation of the extent to which these dimensions of care have been met requires patient input/feedback.

The patients' perspective about care is an important indicator of care quality, complementing more objective, and technical aspects of quality of care evaluation such as the evaluation of the appropriate use of medications and procedures [15]. Its assessment is recognized as one of the high-priority topics for cancer quality measure development [16]. A patient satisfaction assessment indicates the success of a service in meeting patients' needs and expectations (i.e., satisfaction with the results of care) [17]. It may also shed light on factors underlying the link between the structure and process of care and its resulting outcome. Patients who are satisfied with their care are more likely to comply with treatment schedules in maintenance therapies [18]. Satisfaction with cancer care has also been associated with improved clinical outcomes [19].

A *sine qua non* of integrating patients' perspective for health care survey and program evaluation efforts is the availability of appropriate measures. This includes both evidence of adequate content coverage and more formal psychometric properties (i.e., reliability and validity) [20].

Literature reviews on patient satisfaction instruments have been performed in the broad context of health care services [21], general outpatient care [22], overall cancer care [23–25], cancer treatment [26], or interpersonal aspects of cancer care [27]. A variety of cancer patient satisfaction questionnaires are used, making it difficult to compare and integrate results across studies [25]. Moreover, most questionnaires have suboptimal psychometric properties, or there is insufficient evidence available on their psychometric performance [23,24]. Aspects of care pinpointed as important for cancer patients' satisfaction include the technical competence, and interpersonal and communication skills of HCPs, as well as the accessibility of services [23,25].

To the best of our knowledge, there has not yet been a systematic review of patient satisfaction measures specifically intended for use in outpatient oncology settings. Increasingly, oncology treatments are being delivered in ambulatory settings, including chemotherapy day hospital units [28–32] and radiotherapy ambulatory services [33,34]. The trend toward shorter hospital stays has also led to expansion of ambulatory follow-up care programs [35]. So a focus on the measurement of patients' perspective of the care provided in the outpatient oncology settings was found particularly timely [9,35].

In the general ambulatory setting, Saila [22] identified aspects of care that are most relevant for patient dissatisfaction. These include having to wait for an appointment, the length of waiting time at the clinic, duration of consultations, limited availability and accessibility to care providers, lack of care continuity, not being able to

participate in and contribute to decision-making, and inadequate care provider awareness of personal life circumstances. In the cancer outpatient setting, care, treatment, and medical follow-up or rehabilitation are often extended over longer periods. In this setting, ease of access to care, the availability of health professionals, coordination and continuity of care, and involvement of family or friends may be particularly important to patients. We hypothesized that instruments assessing patient satisfaction in the cancer outpatient setting would stress these aspects of care, but that, based on the available literature, the psychometric properties of existing instruments are inadequate.

In this paper, we report the results of a systematic review of patient satisfaction instruments developed or used in the cancer outpatient setting. We had two primary objectives:

1. To describe the content of cancer patient satisfaction questionnaires for use in the cancer outpatient treatment/consultation setting and highlight potential gaps in care aspects assessed;
2. To evaluate the psychometric properties of these questionnaires.

Methods

The methods used in this review were informed by the Centre for Reviews and Dissemination guidance for undertaking systematic reviews [36], and the reporting follows the Preferred Reporting Items of the Systematic reviews and Meta-analyses guidelines [37].

Search strategy

We conducted a systematic literature search using MEDLINE/PubMed, PsycINFO, CINAHL, Scopus, and BVS-LILACS electronic databases. The search was restricted to articles published between January 1999 and March 2014.

The following keywords were used: cancer, neoplasm, and oncology; satisfaction with care, patient satisfaction, patient experience, and perception of quality of care; psychometrics, validation; ambulatory, and outpatient. Relevant websites (Functional Assessment of Chronic Illness Therapy-FACIT; Picker Institute; National Committee Quality Assurance-Consumer Assessment of Healthcare Providers and Systems) and articles' reference lists were also examined for any additional eligible publications to be included in this review.

An example of the full electronic search strategy is provided in Figure 1.

Inclusion and exclusion criteria

We selected peer-reviewed articles reporting studies assessing adult cancer patient satisfaction with care received in the outpatient setting or the development and

Search (neoplasm OR cancer OR oncol*) AND (satisfaction with care OR patient satisfaction OR patient experience OR patient perception of care quality) AND (explode outpatient* OR explode ambulatory) AND (psychomet* OR validation) Limits: Human, English or French, All adults: 18+ years, Publication Date from 1999/01/01 to 2014/03/01.

Figure 1. Full electronic search used in PubMed

psychometric evaluation of patient satisfaction questionnaires for use in the cancer outpatient setting. Only articles published in English or French were considered.

To elicit the patients' perspective on care, questionnaires may employ different approaches, including assessment of the perceived quality of or satisfaction with care, and self-reported experiences with various aspects of care. Both types of assessment are relevant and potentially important [27] and thus are included in this review.

We excluded articles reporting literature reviews or qualitative studies, involving mixed populations (oncology and noncancer), focused on cancer inpatients or survivors only; focused on screening/radiology, outpatient surgery, palliative/end of life, or community/home care only; focused on children (age less than 18 years), caregivers, or family; and focused on questionnaires assessing pain, quality of life, needs/expectations/preferences for care, or on satisfaction with only a single dimension of care (e.g., communication, information, support, coordination, or continuity).

Two authors (A. B. and T. B.) independently screened titles, abstracts, and full-texts retrieved by the literature searches.

Data extraction and analysis

We extracted information from each eligible article on the study objectives and methods (i.e., country, target population, setting, and response rate), questionnaires content (i.e., domains of care assessed), and format (i.e., item stem, response scale, and time frame).

We used the COSMIN checklist for evaluating the methodological quality of the instruments' measurement properties as reported in the articles included in our review [38,39]. Two reviewers (A. B. and J-L. K.) independently reviewed all articles, and any discrepancies were resolved by consensus. The following criteria and thresholds were applied:

1. Questionnaire acceptability : the frequency of item missing data (excluding nonapplicable response) should be mentioned, and 90% of the questionnaire items should have less than 10% missing responses;
2. Internal consistency: the degree to which items in a (sub)scale are intercorrelated, (Cronbach's alpha (α) ≥ 0.70) [40];
3. Temporal stability : the degree to which items in a (sub)scale are correlated while administered at two

occasions under similar conditions (intraclass correlation coefficient/weighted kappa ≥ 0.70) [40,41];

4. Content validity: the degree to which the content of an instrument is an adequate reflection of the construct measured and the target population (in this case, cancer outpatients) was involved in item selection.
5. Structural validity: the degree to which the scores of an instrument are an adequate reflection of the dimensionality of the construct to be measured (if exploratory factor analyses, factors should explain at least 50% of all questionnaire item score variance [38]; if confirmatory factor analyses, fit estimates should be satisfactory; if item response theory (IRT) tests, the IRT model and the method for estimation used should be described, and the assumptions for estimating parameters of the IRT model and the model fit adequacy should be checked);
6. Hypothesis testing (construct validity): the degree to which the scores of an instrument are consistent with hypotheses regarding item-scale associations, correlations with other instruments, or differences between relevant groups (hypothesis must be formulated *a priori*; no item cross-loadings in factor analyses, correlations with an instrument measuring the same construct ≥ 0.40 or correlations with related constructs higher than with unrelated constructs: 75% of the results are in accordance with the hypotheses) [41];
7. Response coverage: the adequacy of score distribution (ceiling effects were considered if more than 80% of items presented more than 20% responses at the highest value, or if the mean scale/item scores were above 80% of the highest expected scale value in more than 20% of the cases);
8. Cross-cultural validity: the degree to which measurement properties are equivalent across language versions (documented methods to translate the questionnaire in other languages);
9. Generalisability of the study results: the degree to which the sample is representative of the target population (response rate should be reported and sample characteristics should be similar to those of the target population).

We scored each patient satisfaction questionnaire on each criterion, using the categories: criterion met (+), criterion partially met (\pm), criterion not met (−), and unclear (not mentioned at all in any articles on that measure or insufficient information provided to rate accurately) (?).

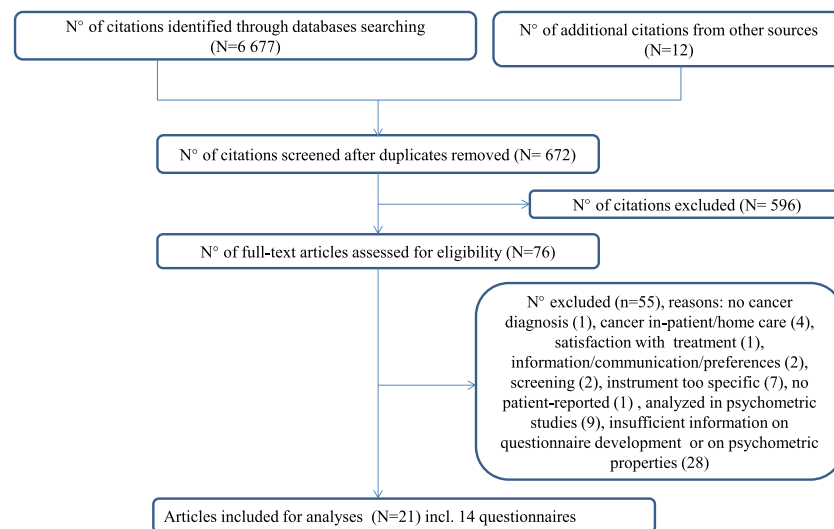


Figure 2. PRISMA flowchart of the number of selected articles

We summarized scoring by summing the number of + or ± ratings for each article and questionnaire and dividing this sum by 11 (the total number of criteria used to evaluate psychometric performance). This overall summary score provides one way of comparing the psychometric performance of the different questionnaires included in the review.

Results

The search returned 6677 hits. After deleting duplicates and irrelevant titles and applying the set of inclusion and exclusion criteria, 76 articles remained and were screened in great detail. Fifty-five articles were subsequently rejected, primarily because of extensive missing information on the questionnaire's development or psychometric properties (see Figure 2 and Supporting information).

General description of studies

We evaluated 21 articles bearing on 14 questionnaires. The articles addressed patients with any type of cancer diagnosis [28,29,33,42–53], with breast cancer [54,55], prostate cancer [56,57], hepatocellular carcinoma [58], and breast or lung cancer [59]. The full names of the 14 questionnaires and their abbreviations are provided in Table 1. Here, we use the abbreviations for the sake of parsimony.

Four questionnaires (Comprehensive Assessment of Satisfaction with Care [CASC], Chinese Patient Satisfaction Questionnaire [ChPSQ], Out-Patient Satisfaction with cancer care [OUT-PATSAT35], and Patient Satisfaction with Cancer Care [PSCC/PSCC-SP]) were assessed for their psychometric properties in diverse cancer populations or cultural settings [28,33,44,45,48,49,52,58,59].

The study sampling was carried out in a single hospital [28,33,42,44], several hospitals [45,46,51–53,55,57–59], or regionally/nationally [29,43,47–50,54,56].

Studies were performed in the USA [48–51,56]; the UK [42,46,57]; the Netherlands [43,55]; France [52–54]; Germany [29]; Italy [44]; Norway [47]; France, Italy, Poland, and Sweden [45]; Spain [28,33]; or China [58,59].

Questionnaires type, format, and content

Of the 14 questionnaires, the CASC [44,45] includes a separate section on outpatient care, the Cancer Patient Experience Questionnaire (CPEQ) [47] has a outpatient version, the OUT-PATSAT35 [28,33,52,53] is specifically adapted to the outpatient radiotherapy or chemotherapy setting, the ChPSQ [58,59] to the oncology visit, and the Worthing Chemotherapy Satisfaction Questionnaire (WCSQ) [42] to the outpatient chemotherapy unit nursing care setting. The remaining nine questionnaires—the Cancer of the Prostate Strategic Urologic Research Endeavour (CAPSURE) [56]; Patient Views of Cancer Services ('PVCS') [46]; Consumer Quality Index Cancer Care (CQI-CC) [43]; Functional Assessment of Chronic Illness Therapy Treatment Satisfaction (FACIT-TS) [51]; Prostate Care Questionnaire Patient (PCQ-P) [57]; Patient Satisfaction and Quality Of life Cancer (PASQOC) [29]; PSCC/PSCC-SP [48–50]; Quality of Care Through the Patient's Eyes–Breast Cancer (QUOTE-BC) [55] and REPERES-60 [54]—are intended to be used in various phases of cancer care (i.e., both inpatient and outpatient).

Seven of the questionnaires employ items formulated uniformly in terms of favorable, unfavorable, or neutral aspects of care (CAPSURE [56], PVCS [46], and the PSCC/PSCC-SP [48–50]), satisfaction (ChPSQ [58,59]),

Table 1. Questionnaire content

Care domains	Overall satisfaction	Information, communication	Interpersonal skills	Technical skills	Treatment satisfaction
Cancer of the Prostate Strategic Urologic Research Endeavor—CaPSURE [56]	√	√	√	√	
Comprehensive Assessment of Satisfaction with Care—CASC [44,45]	√	√	√	√	
Cancer Patient Experience Questionnaire—CPEQ (outpatient version) ^a [47]		√	√	√	
Chinese Patient Satisfaction Questionnaire—ChPSQ-9 [58,59]		√	√	√	
Consumer Quality Index Cancer Care—CQI-CC ^b [43]		√	√	√	
Functional Assessment of Chronic Illness Therapy Treatment Satisfaction—FACIT-TS ^c [51]	√	√	√	√	√
Out-Patient Satisfaction with cancer care—OUT-PATSAT35 [28,33,52,53]	√	√	√	√	
Patient Satisfaction and Quality of Life Cancer—PASQOC ^c [29]		√	√	√	√
Patient Views of Cancer Services—PVCS ^b [46]	√	√	√		
Quality of Care Through the Patient's Eyes—Breast Cancer—QUOTE-BC [55]		√	√	√	
Patient Satisfaction with Cancer Care—PSCC; PSCC-SP [48–50]	√	√	√	√	
Prostate Care Questionnaire Patient—PCQ-P ^d [57]	√	√	√	√	√
REPERES-60 ^d [54]	√	√	√	√	
Worthing Chemotherapy Satisfaction Questionnaire—WCSQ [42]	√	√	√	√	

^aItems included in factor analysis.

^bLimited information in paper.

^cFACIT website.

^dAdditional file.

perception of care quality (OUT-PATSAT35 [28,33,52,53] and REPERES-60 [54]), and frequency or extent of occurrence of various aspects of care (CPEQ) [47]. The remaining questionnaires use a mix of item formulations: levels of agreement and satisfaction (WCSQ [42]); reports of care event and quality rating (FACIT-TS [51], PASCOQ [29], and PCQ-P [57]); care performance, importance, and quality rating (CQI-CC [43] and QUOTE-BC [55]); and quality rating and wish for improvement (CASC [44,45]).

The time frame of the questionnaires varies widely or is loosely specified: no less than 3 or 4 months post-diagnose (CAPSURE [56]); treatment or care received recently (WCSQ [42], OUT-PATSAT35 [28,33,52,53], CASC [44,45], FACIT-TS [51], and ChPSQ [58,59]), in the past 3 (CPEQ [47]) or 12 months (REPERES-60 [54]); different time frames (PASCOQ [29], CQI-CC [43], and PCQ-P [57]); and along the cancer care trajectory (PSCC/PSCC-SP [48–50] and QUOTE-BC [55]) or unclear (PVCS [46]).

Table 1 indicates the care domains (defined according to the conceptual frameworks of Ware *et al.* [13] and Gerteis *et al.* [14]) covered by each of the questionnaires. The three questionnaires that most comprehensively assessed the domains considered as important for cancer patient [23,25] or outpatient [22] satisfaction are the CASC [44,45], PASCOQ [29], and PCQ-P [57].

Development process and linguistic versions

In all but two cases (CAPSURE [56] and PSCC/PSCC-SP [48–50]), patients were involved in the original questionnaire development process, using individual patient interview (CASC [44], ChPSQ [58], FACIT-TS [51],

OUT-PATSAT35 [52], PCQ-P [57], and WCSQ [42]) or focus groups (CPEQ [47], CQI-CC [43], PASQOC [29], PVCS [46], QUOTE-BC [55], and REPERES-60 [54]).

Two questionnaires have been translated in other languages: the CQI-CC [43] from Dutch into English and the FACIT-TS [51] from English into other languages. Three questionnaires were translated and validated sequentially across different countries/languages: the CASC [44] in French, Italian, Polish, and Swedish [45]; the OUT-PATSAT35 in French [52] and Spanish [28,33]; and the PSCC/PSCC-SP in English [48] and Spanish [49]. Other questionnaires are only available in their original language: English (CAPSURE [56], PVCS [46], PCQ-P [57], WCSQ [42]), Norwegian (CPEQ [47]), Chinese (ChPSQ [58,59]), German (PASQOC [29]), Dutch (QUOTE-BC [55]), or French (REPERES-60 [54]).

Psychometric characteristics of the questionnaires

Table 2 provides a summary of the psychometric performance per measurement property of the 14 questionnaires for each article based on the adapted COSMIN checklist [38].

Item level missing data rates were indicated for the OUT-PATSAT35 [28,53], CASC [44,45], PVCS [46], CPEQ [47], FACIT-TS [51], and QUOTE-BC [55]. Most subscales or total scales internal consistency Cronbach's alpha coefficients were above 0.70, except for the CAPSURE [56]; test-retests were performed for the CPEQ [47], FACIT-TS [51], REPERES-60 [54], CAPSURE [56], PCQ-P [57], and ICC's above 0.70 in one or more subscales, or the total scale were reported for the CPEQ [47], FACIT-TS [51], REPERES-60 [54], and PCQ-P [57].

Choice	Coordination	Continuity transition	Waiting time	Availability	Access	Environment	Family/friends	Education	Psychosocial/supportive support	Financial aspects
	√	√	√	√	√	√	√		√	√
	√	√		√			√			
√	√	√							√	
√	√			√	√	√			√	
√	√		√	√	√	√	√	√	√	
√	√	√	√	√					√	
√	√	√	√	√				√	√	
√	√	√	√	√		√	√	√	√	√
√	√		√	√	√	√	√	√	√	√

Information on ceiling effects indicated that the CASC [44], OUT-PATSAT [53], REPERES-60 [54], and PCQ-P [57] evidenced acceptable score variation results with most scale means scoring less than 80% of the scale.

Exploratory factor analyses or confirmatory factor analysis on all questionnaire items was performed on the WCSQ [42], PSCC/PSCC-SP [48,49], REPERES-60 [54], and ChPSQ [58,59]. Information on item-scale correlation analyses or multitrait scaling analyses was provided for the OUT-PATSAT35 [28,33,53], CASC [44,45], CPEQ [47], PSCC/PSCC-SP [48,49], REPERES-60 [54], QUOTE-BC [55], and ChPSQ [58]. IRT analysis was performed for the PSCC [50], FACIT-TS [51], and OUT-PATSAT35 [53]. *A priori* hypotheses testing based on correlations with other instrument(s) was carried out for the OUT-PATSAT35 [28,33,52], the CPEQ [47], FACIT-TS [51], REPERES-60 [54], CAPSURE [56], PCQ-P [57], and ChPSQ [58] and by known-group comparisons for the WCSQ [42], OUT-PATSAT35 [28,33], PVCS [46], CPEQ [47], FACIT-TS [51], and REPERES-60 [54].

Over 11 criteria, six or less of them could be tested in five studies (24%) [42,29,43,45,59]; 50% or over positive ratings were identified in four studies (19%) [44,47,53,54].

Discussion

In this systematic review, we identified 21 articles describing the content and psychometric characteristics of 14 questionnaires designed to assess patient satisfaction with or experience in the outpatient cancer care setting.

Summary of the results

The scope of the content of most questionnaires reviewed broadly covers the whole cancer care trajectory allowing

for comparisons across settings and interpretation of satisfaction with care data. However, only three (CASC [44,45], PASCOQ [29], and PCQ-P [57]) comprehensively assess the domains considered as important to cancer patient [23,25] or outpatient [22] care.

Compared with an earlier review of published reports on assessment of health care service user satisfaction in various clinical contexts [21], the studies under current review provided substantially more information about questionnaires reliability and validity. This may reflect the evolution of the field, with guidelines for evaluating and reporting the methodological quality of psychometric studies [20,60–63]. However, using an internationally developed methodological standards checklist [38], as in Tzelepis *et al.* [24] but addressing the cancer outpatient setting, we found that most of the questionnaires reviewed exhibited inadequacies and/or were characterized by incomplete psychometric reporting.

For example, item missing data, which reflect possible misunderstanding, intrusiveness, lack of relevance, or other type of problems, were seldom reported. Internal consistency was generally documented while information on construct validity was often insufficient. Factor analysis on overall questionnaire items was only carried out on four questionnaires (ChPSQ [58,59], PSCC/PSCC-SP [48,49], REPERES-60 [54], and WCSQ [42]) and IRT modeling on an additional three (the FACIT-TS [51], OUT-PATSAT35 [53], and PSCC [50]).

Construct validity testing was often performed on a large number of variables without specifying *a priori* hypotheses. Moreover, except in Cheater [46], known-group comparison analyses were based on patients' rather than on cancer care characteristics. While the former is useful, the latter is often the focus of interest (i.e., whether there

Table 2. Psychometric performance per measurement property by instrument and article according to adapted COSMIN checklist [39] (N = 21 psychometric studies)

Questionnaire name	Response rate (N)	% missing items	Internal consistency	Temporal stability	Content validity	Structural validity	Item response theory models	Internal relationships	Correlations		
									other instruments	Known-group comparisons	Ceiling effects
CAPSURE [56]	Not reported (N = 228)	No info	Cronbach's alpha < 0.70 for 4 over 5 scales (total scale: 0.82. On subscale measures: 0.37 to 0.54)	ICC: 0.62 on total and 0.38–0.63 on subscales; <0.70 for all scales	No info	Not assessed	Not assessed	Over eight items (35 interitem correlations), eight correlations with own scale not higher than with other scale but no info on correlation item scales	No correlation with participation style scale	Significant difference in SF-36 scales between highly satisfied and less satisfied in 3 over 6 comparisons; no hypothesis (for age, ethnicity, education, and comorbidity)	>40% in 4/5 scales
Score CASC [44]	73% (N = 290) no difference between R/NR	<5% except 2 items/50	Cronbach's alphas > 0.70	Not assessed	Yes	>50% score variance explained by questionnaire sections but no global factor analysis	Not assessed	? Mean scaling successes = 77%	Not assessed	Not assessed	Mean scores on 1–5 scale ≥4 in 1/11 scales
Score CASC [45]	91–100% (N = 123–290)	Median 1% to 7% (0–2.1% by item)	Cronbach's Alpha > 0.70	Not assessed	Yes in original development	Not assessed	Not assessed	Scaling failure: 0–9%	Not assessed	? Not assessed	No info
Score CPEQ [47]	52% (N = 72/12) —no info on representativeness	2 items/32: 10%/12%	For outpatients: >0.70 for 5/6 scales	For outpatients: >0.70 for 4/6 scales	Yes	For outpatients: 62% of variance explained; 4 factors; but 8 items of 2 scales omitted in EFA	Not assessed	For outpatient: no cross-loadings for items included in analyses	Not assessed	? 31/42 significant correlations (based on hyp for global satisfaction, health status, age, gender, and time since diagnosis)	Most item mean scores ≥4 on a 1–5 range
Score ChPSQ-9 [58]	? Not reported (N = 222)	+ No info	+/- Cronbach's Alpha: 0.89 and 0.94 (ChPSQ-9)	+/- Not assessed	+ Yes	+/- >79% of score variance; 2 factors	? Not assessed	+/- All item with cross-loading	? With C-MISS (=0.27); with measures of eating satisfaction (≤0.02)	+/- Pearson r = 0.14 with age, nor with gender, nor education; no hypothesis	No info
Score ChPSQ-9 [59]	41% (N = 583); no info on representativeness	- No info	+ Cronbach's Alpha for doctor and entire scale > 0.92; for nurse scale: 0.86–0.89	? Not assessed	+ Yes	+ CFA: better fit of the correlated model (CFI ≥ 0.96) over one factor (CFI ≥ 0.79) or hierarchical models (CFI ≥ 0.81); factorial invariance over assess time (CFI ≥ 0.95)	? Not assessed	- Not assessed	+ Not assessed	- Not assessed	? On scale 1–5, mean item scores >4 in 3 and 4 items/9
Score	?	-	+ ?	? ?	+ ?	+ ?	? ?	? ?	? ?	? ?	- -

Scale	50% (N = 732); representativeness	No question with > 5%	Cronbach's Alpha: 0.73-0.86 for six scales	Yes	No info	Not assessed	Yes	Not assessed	Not assessed	Not assessed	Significant difference between tumor type on 5 scales over 12 with highest score for breast cap; no <i>a priori</i> hypotheses	6/12 scales with mean score > 3.5 on 1-4 range	
Score FACT-TS [51]	+ N = 58, 136, 29, and 207	+ No info	+ Cronbach's Alpha: 0.72-0.95	Yes	? CFA; good model fit for factor solution: CFI/TLI > 0.95 but 2 factors omitted in analyses	? Fit to graded response for unidimensional sub-domains, estimation method and assumptions not checked, acceptable fit of one subscale	+ ?	? Not assessed	? 13/28 r with PSQ Ill between 0.30 and 0.50 (moderate effect size as hypothesized)	? ?	- ?	- Ceiling: 32-76%	
Score OUP-PATSAT35-RT [33]	- 94% (N = 100); not clear how simple was recruited	- No info	+ Cronbach's Alpha: 0.70-0.97, except for environment: 0.60	Yes in original development with cancer outpatients	+/- Not assessed	- Not assessed	+ ?	? 33/34 items exceeded the 0.4 criterion for convergent validity; 15/34 items did not meet discriminant validity criteria	- ?	+ ?	+ Significant difference between groups on number of doctors visits (8/13), intention to recommend (12/13), KPS (1/13), no difference for age, and education (81 tests confirmed/130)	- ?	- Ceiling 5-51% (>40% for 8/13 scales)
Score OUP-PATSAT35-CT [28]	? 97% (N = 176)	- 3 items/35 with > 5% (item 29; 13% missing)	+/- Cronbach's Alpha: 0.78-0.97, except for environment, ease access, and doctor availability (0.53, 0.63, and 0.60)	Yes in original development	? Not assessed	? Not assessed	+ ?	- ?	+/- ?	- ?	- ?	- ?	- Ceiling: 11-65% (>40% in 11/13 scales)
Score OUP-PATSAT35 [52]	+ 96% (N = 416)	+ 3 items/35 > 10%	+/- Cronbach's alpha: 0.72-0.96	Yes	? Not assessed	? Not assessed	+ ?	- ?	+/- ?	- ?	- ?	- ?	- Ceiling effect range: 12-50%

(Continues)

Table 2. (Continued)

Questionnaire name	Response rate (N)	% missing items	Internal consistency	Temporal stability	Content validity	Structural validity	Item response theory models	Internal relationships	Correlations		
									other instruments	Known-group comparisons	Ceiling effects
Score OUT-PATSA135 [53]	+ 87.4% representativeness unclear	+ 5.7%	+ All Cronbach's alphas >0.70	? Not assessed	+ Yes	? 71% (12 original scales non found)	? Graded response model and rating scale model compared; assumptions of unidimensionality, monotonicity, local independence checked; poor to moderate model fit	? All items >0.40; 8/35 items not respecting divergent validity	+ Not assessed	- Not assessed	? Ceiling effect range: 6.7-27.6%; no mean score >80% of highest score
Score PASQOC [29]	+/- 81.9% (N = 2772)	+ No info	+ Cronbach's Alpha: 0.71 to 0.87 but shown only for 5/15 scales	? Not assessed	+ Yes	+/- No info	+/- Not assessed	+ Not assessed	? Low correlation with the quality of life; no a priori hypothesis: <0.04	? Not assessed	+ No info
Score PVCS [46]	? 66% (N = 298) -No difference between RNR on gender and age	- 0-10% item missing range	± Cronbach's Alpha: 0.75 - 0.91	? Not assessed	Yes	? Not assessed	? Not assessed	? Small significant positive association between scores of 8 subsections and 'overall care' (r=0.21) but correlation between scales not item scales	- Not assessed	? No diff in satisfaction scores bet. groups by age/ hypothesis stated	? Mean score on 1-5 scale >4 in 4 over 9 scales
Score QUOTE-BC [55]	+ 47% (N = 276) no info on representativity	+/- <10%	+ Cronbach's alpha: 0.70-0.89	? Not assessed	Yes	? % of variance : no info	? Not assessed	? Corrected item-total correlation >0.50 except 1 item/23; 2/29 items with cross-loadings	? Not assessed	+/- No significant difference between groups on age, education, health perception, time since surgery/ no hypothesis stated	- Mean item performance scores >80% of range in 21/29 items
Score PSCC [48]	? N = 891 (more likely female, minority, lower income, less educated)	+ No info	+ Cronbach's Alpha = 0.95 and 0.96 (2 studies)	? Not assessed	No info	? 62% of score variance explained	? Not assessed	+ All factor loadings >0.40; one factor solution	? r with CASE-cancer = 0.40; 0.32; 0.51; 0.30; 0.39	- No significant diff bet. groups on age, language, marital status/No hypothesis stated	- No info
Score	+/-	-	+ No info	? Not assessed	- No info	+ No info	? Not assessed	+ All factor loadings >0.40; one factor solution	+/- Not assessed	- No info	? No info

PSCC-SP [49]	Not reported (N = 285)	No info	Cronbach's Alpha: 0.92	Not assessed	No info	47% of score variance explained	Not assessed	All factor loadings >0.40; one factor solution	r with PSNI-SP = 0.27 no hypothesis	No significant diff bet groups on age, language, marital status/No hypothesis stated	No info
Score	-	-	+	?	-	+/-	?	+	-	-	?
PSCC [50]	Not reported (N = 1,296)	No info	Cronbach's alphas = 0.95 and 0.96	Not assessed	No info	62% of score variance explained; acceptable fit	Unconstrained graded response and Rasch Model compared; unidimensionality assumption checked; no test of adequacy on final model	Factor loadings bet 0.6-0.8 on one factor	Not assessed	Not assessed	No info
Score	-	-	+	?	-	+	+/-	+	-	-	?
PCQ-P [57]	69% (N = 865)	<15.4%; most <10%	Cronbach's Alpha: 0.63-0.80	ICC: 0.57-0.73	Yes	No global factor analysis (additional file)	Not assessed	15/73 items cross-loadings (additional file)/no factor analysis on the total items; factor analyses on subsections	r with NCSRSQ = -0.23 and -0.46 (1 hypothesis/2 confirmed)	Not assessed	Mean range: 65.9-86.4; Scale ceiling: 1.2-17.5%
Score	?	?	+/-	+/-	+	?	?	?	-	?	+/-
REFERS-60 [54]	87% (N = 850)	Unclear info (additional file 2)	Cronbach's alpha: 0.74-0.94	ICC: 0.62-0.85	Yes	45% of score variance explained	Not assessed	All item >0.40 with their own scale except one which loaded on two factors; one high inter-scale correlation/12 scales; 5/60 items cross-loadings	r ≤ 0.29 with QOL	Most subscales were able to discriminate between patients in terms of age, education, health status/hypothesis stated (42/52 tests +)	Less than 20% ceiling in all scales and no scale with mean >80 (additional file-4)
Score	?	?	+	+/-	+	+/-	?	+	+	+	+
WCSC [42]	86% (N = 173) completed questionnaire	No info	Cronbach's Alpha for subscales: 0.35 (hospital access) to 0.92	Not assessed	Yes	67% of score variance explained	Not assessed	Not assessed	Not assessed	Comparison between compliant/noncompliant patients (p < 0.01) for 3 out of 4 tests performed on 4 items over 25	No info
Score	?	-	+/-	?	+	+	?	?	?	+/-	?

CAPSURE; Cancer of the Prostate Strategic Urologic Research Endeavour; CASc, Comprehensive Assessment of Satisfaction with Care; CPEQ, Cancer Patient Experience Questionnaire; CHPSQ-9, Chinese Patient Satisfaction Questionnaire 9; CQI-CC, Consumer Quality Index Cancer Care; FACIT-TS, Functional Assessment of Chronic Illness Therapy Treatment Satisfaction; OUT-PATSA T35, Out-Patient Satisfaction with Cancer Care; PASQOC, Patient Satisfaction and Quality of life Cancer; QUOTE-BC, Quality of Care Through the Patient's Eyes-Breast Cancer; PSCC, Patient Satisfaction with Cancer Care; PCQ-P, Prostate Care Questionnaire Patient; PVCS, Patient views of Cancer Services; WCSC, Worthing Chemotherapy Satisfaction Questionnaire.

are differences in satisfaction as a function of the content, structure, or process of cancer care).

A ceiling effect, which may affect the ability of a questionnaire to identify areas where improvement in care is needed most, was present in most questionnaires providing this information, except for the CASC [44], OUT-PATSAT35 [53], REPERES-60 [54], and PCQ-P [57].

Importantly, only three questionnaires (CASC [44,45], OUT-PATSAT35 [28,33,52], and PSCC/PSCC-SP [48,49]) provided additional information through the replication of their validation in different cross-cultural settings. The cultural background is a complex determinant of patient satisfaction, which warrants research using cross-culturally validated instrument in order to target care improvement initiatives tailored to specific populations.

Implications for clinical practice and quality improvement in outpatient oncology

In addition to general aspects of care such as HCPs and patients' interpersonal relationships or communication, to specifically assess cancer outpatient satisfaction, the content of questionnaires should address care transition and continuity, accessibility, and involvement of family or friends. At present, few questionnaires could be recommended on the basis of content coverage (CASC [44,45], PASCOQ [29], and PCQ-P [57]) or psychometric evidence (CASC [44], CPEQ [47], OUT-PATSAT35 [28,53], and REPERES-60 [54]). Two of these questionnaires are specific to one cancer site (PCQ-P [57] and REPERES-60 [54]) and so do not allow the assessment of cancer care across settings. Further efforts are needed to demonstrate the psychometric robustness and interpretability of these questionnaires. For example, only the PVCS [46] has been demonstrated to distinguish satisfaction scores between different care modalities, and no questionnaire has been tested for its ability to detect changes in satisfaction over time as a function of care improvement initiatives. Moreover, for most satisfaction measures, there is insufficient evidence of cross-cultural validity, limiting the possibility of comparing results across studies.

Limitations and strengths

Several possible limitations of our review should be noted. First, because of the heterogeneity of concepts of interest (e.g., satisfaction, quality, and experience) it is difficult

to generate a watertight bibliographic search strategy. We cannot rule out the possibility that we may have missed some relevant articles. Second, we chose to exclude studies carried out in the context of day surgery and oncology survivorship consultations. This context deserves separate attention, because these are types of care that are evolving rapidly, and thus require appropriate satisfaction questionnaires [64]. Finally, we could not evaluate the questionnaires' criterion validity or responsiveness to change over time because these properties were not tested in any of the psychometric studies reviewed. This may be explained by the lack of a 'gold standard' (i.e., true patient satisfaction) with which to compare patient satisfaction scores. It may be possible to assess questionnaire responsiveness by investigating the extent to which it changes over time in relation to other, related measures (e.g., of met expectations and willingness to recommend a treatment setting to others).

The main strength of this review is that the methodological quality of the psychometric studies included was assessed with a robust and standardized checklist specifically developed for this purpose (i.e., the COSMIN checklist [39]). Our data can help HCPs, managers, and policy makers in making more informed, evidence-based decisions when selecting satisfaction with care instruments to be used in quality of care initiatives. The use of high quality questionnaires is critical when the results are intended to influence the planning, organization, and provision of health care.

Conclusions

The patient's perspective on the quality of care is essential in evaluating cancer care [15,16]. In selecting a patient satisfaction measure, we need sufficient information about the appropriateness of its content and its psychometric qualities. Although a number of promising questionnaires are currently available, this systematic review highlights the need for additional research on the methods for assessing cancer patient satisfaction with care in the outpatient setting.

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