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J Health Serv Res Policy published online 29 October 2013
DOI: 10.1177/1355819613508381

Original Research

Journal of Health Services Research & Policy
0(0) 1–9

DOI: 10.1177/1355819613508381
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Development and validation of a patient satisfaction questionnaire for outpatients attending health centres in North Indian cities

Sonu Goel[1], Deepak Sharma[2] and Amarjeet Singh[3]

Abstract

Objectives: With the mandate of the Indian Government to improve health services for the population, improving patients' satisfaction with outpatient department (OPD) services is vital. Many scales developed in Western societies to assess patient satisfaction may not be appropriate to the Indian health care system. The aim of this study was to develop and conduct initial psychometric testing of a satisfaction questionnaire for patients attending OPDs in North India.

Methods: The North India Outpatient Department Satisfaction Scale (NIOPDSS) was initially constructed based on a Delphi consensus among experts. After pretesting on a small number of patients, a cross-sectional survey was conducted among 942 outpatients in Chandigarh, North India. The psychometric properties of the questionnaire in terms of content validity, construct validity, convergent and discriminant validity, and reliability were assessed.

Results: Eighty items were generated from the Delphi exercise. After assessing the content validity, data quality and construct validity of the questionnaire, a final instrument with 17 items representing six dimensions of patient satisfaction was developed. The internal consistency ranged from 0.72 to 0.93 and intra-class correlation coefficient ranged from 0.52 to 0.80.

Conclusion: NIOPDSS appears to be a reliable and valid measure of patient satisfaction for patients attending OPDs in North India. Further research should be carried out with different outpatient populations to assess the wider performance of the questionnaire.

Keywords

patient satisfaction measurement, outpatient care, ambulatory care

Introduction

Improving the quality of patient care in hospitals is vital. In India, most health care is provided through outpatient departments (OPDs), more specialized inpatient departments and emergency departments. The quality of services in OPDs is important for the hospital service as a whole.[1,2] Patient satisfaction is affected by the patient's expectations and the care received.[3] In addition, patients' experiences affect their future health-seeking behaviour. Patients are more likely to choose the health care services based on the satisfaction level.[4,5] There is also a higher likelihood that a satisfied patient will recommend the public health facility to others. Patient dissatisfaction with OPD services may lead to shifting to more costly private hospitals or cheaper options such as treatment by quacks. Treatment by an unqualified medical practitioner is associated with poor quality of care.[3] Further, unexpected out of pocket payments for health care can push households into poverty.[6]

An array of questionnaires has been developed to measure patient satisfaction with hospital care including the Patient Satisfaction Questionnaire (PSQ-18),[7] European Task Force on Patient evaluations of General Practice (EUROEP instrument)[8] and Primary

[1]Assistant Professor of Health Management, School of Public Health, Post Graduate Institute of Medical Education and Research, Chandigarh, India
[2]Senior Resident, School of Public Health, Post Graduate Institute of Medical Education and Research, Chandigarh, India
[3]Professor, School of Public Health, Post Graduate Institute of Medical Education and Research, Chandigarh, India

Corresponding author:
Sonu Goel, School of Public Health, Post Graduate Institute of Medical Education and Research, Chandigarh 160012, India.
Email: sonugoel007@yahoo.co.in

Care Assessment Survey.[9] However, these are generic tools for user evaluation across a range of health care services (inpatient and outpatient). Also, all of them have been developed among Western populations attending hospitals and are therefore difficult to apply in developing countries because of differences in culture and health systems. For example, the PSQ-18 evaluates the dimensions of technical quality, interpersonal manner, communication (doctor-patient), financial aspects, time spent with the patient, convenience and accessibility of a medical specialist. However, it contains no questions related to the physical environment like accessibility of the hospital; convenience of location of the health facility and the presence of basic amenities (e.g. drinking water, toilets, etc.) which are important in developing countries.[7] The EUROPEP instrument primarily evaluates the clinical behaviour of the physician and organization of care. It ignores various components like the physical environment, location and administration-related aspects of care.[8]

Patient satisfaction constructs may also vary between developed and developing countries. In developed nations, patients generally have appointments to reduce waiting time, in contrast to developing countries where patients are mostly seen on a first come-first served basis. Secondly, in developed countries there are social insurance schemes. Therefore, waiting times, accessibility and location of the health facility and basic amenities are primary dimensions of patient satisfaction in developing nations. Similarly, the availability of medicines in the hospital pharmacy may be important in developing countries where there is a shortage of medicines.[10,11]

Thus, questionnaires from developing countries tend to include difference aspects of care. In a study in Sri Lanka, a 36-item instrument with eight constructs, viz. physical environment; interpersonal care; efficiency; competency; comfort; sanitation; personalized information and general instructions was developed.[12] Another study conducted in Turkey to measure patient satisfaction with health services generated a tool which covered the following: room cleanliness; services such as cafeteria and parking; physician care; nursing care; patient room environment and how the flow of incoming patients was managed.[13]

To the best of knowledge, studies in India have used non-validated instruments to measure patient satisfaction.[14–17] None of these instruments has been developed using standardized methods and none has been studied for its psychometric properties. This hinders the widespread use of all such instruments. There is a need for a valid and reliable tool to measure patient satisfaction with OPDs suited for use in India and perhaps other developing countries. Hence, we decided to develop a valid and a reliable questionnaire, the North Indian Outpatient Department Satisfaction Scale (NIOPDSS) and assess its psychometric properties.

Methods

Item generation

Development of conceptual framework. In order to identify patient satisfaction studies conducted globally, a systematic literature review was undertaken using PubMed (http://www.ncbi.nlm.nih.gov/pubmed), IndMED (http://indmed.nic.in/), Directory of Open Access journals (http://www.doaj.org/) and Google scholar (http://scholar.google.co.in/). Keywords for the search included 'patient satisfaction' and 'outpatient department'. The search was not limited by year or country of publication. In addition, a manual search of articles in journals held in the library of the Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh, India was undertaken. The search strategy resulted in 2208 hits in PubMed. Other search engines revealed similar figures. Screening of studies was then done based on title and abstract followed by evaluating full text which resulted in 20 relevant studies. The screened articles were used to develop a conceptual framework of patient satisfaction.

Questionnaire development. The Delphi technique was selected for use in this study. Delphi is a practical approach to achieve a consensus among a group of experts where none exists. It is based on the assumption that group opinion has a greater validity than an individual opinion.[18]

Two rounds of Delphi were conducted. In the first round, the conceptual framework was presented to experts from the clinical departments of PGIMER and other health care facilities in Chandigarh city. Discussions were held on various dimensions of patient satisfaction. The principal investigator then tried to build consensus on the items to be included in the patient satisfaction instrument. All the items generated were listed in sequence starting from parameters related to entrance to the health facility, then service provision and finally dispensing of medicines. Items were a mixture of both positively and negatively worded items to minimize the danger of agreement response bias.

The second round was held two weeks later. The experts revisited the research questions and refined wording and content of questions to be used.

An 80-item scale was developed which was named the NIOPDSS measuring eight dimensions/constructs: Accessibility and location; registration; waiting area; physician; laboratory; pharmacy; wound dressing room; basic amenities and others (Table 1).

Pilot testing of the instrument. A maximum variation sample of 20 patients attending a health facility not used in the main study (see below) was interviewed using the tool developed during Delphi technique. No selection method was used in order to interview the widest possible range of patients attending the health centre. To examine whether field investigators correctly asked the questions of the instrument, five interviews were audio recorded. No potential problems were found in administration of instrument by field investigator. The principal investigator analysed all data and found that questions were correctly interpreted by patients. The structure of questionnaire remained the same after this stage (i.e. eighty items, eight dimensions).

Item reduction

Data collection. The main study sampled patients from the six hospitals providing health care facilities to the majority of patients in Chandigarh city. The target population consisted of new patients over the age of 20 years. The sample size was calculated using the formula, $n = Z2(1-\alpha/2)pq/d^2$ (where $Z(1\text{-}\alpha/2) = 1.96$ at 95% confidence; p = prevalence of patient satisfaction; $q = 1 - p$ and d = absolute allowable error). We assumed that 50% of the patients would be satisfied with the health services provided. We further set the allowable error at d = 2%. Adding a 10% for incomplete answers, the required sample came to 1172. Thus, we selected a sample of 1200 patients from September 2010 to February 2011.

The data were collected by two researchers who had previous experience of survey research. They were trained in administering the questionnaire by the principal investigator, which helped to standardize the administration of the instrument. The patients were interviewed at the exit locations of the health facility at all times of the day during OPD hours so as to capture their experiences with various dimensions of care. The scoring of questions was on a five-point Likert scale (strongly agree, agree, neutral, disagree and strongly disagree).

Prior permission was sought from the hospital administrator of the concerned health care facility. Informed consent was obtained from each patient interviewed and patients were assured that their individual responses would remain confidential. Data were analysed using Epi Info software for Windows. The study was approved by the Ethics Committee of the PGIMER.

Validation. A content validity index was defined by an independent group of experts from various clinical departments of PGIMER (different from the original panel included in the Delphi exercise). This was done by the standard method as proposed by Lynn.[19] The expert group was asked to assess the content of each item generated on a five-point Likert scale (1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree and 5 = strongly disagree). The assessment was based on the appropriateness, comprehensibility and clarity of phrasing of each item.

Data quality was assessed by the completeness of responses. The percentage of missing data and extent of ceiling and floor effects for each item in the scale were calculated. Items were eliminated if: the missing response rate of an item was more than 10%; the floor and ceiling effect of an item was between 1% and 15%; and items had a correlation of less than 0.30 with the total scale score (corrected item-to-total correlation).[20]

Construct validity was then assessed using Principal Components Analysis (PCA) with varimax rotation. Variables with factor loadings greater than 0.5 were selected.[21] The quality of the factor analysis model was assessed using Bartlett's test for sphericity and the Kaiser–Meyer–Olkin (KMO) test.

Multitrait-multimethod design[22] was used wherein item convergence was defined as a correlation of 0.40 or greater between an item and its own scale (corrected for overlap). Item discrimination was based on a comparison of the magnitude of the correlation of an item with its own scale compared with other scales.

Reliability of the questionnaire. The internal consistency of each dimension of the instrument was assessed using Cronbach's alpha. An alpha above 0.7 was considered consistent.[23]. For testing the stability of the instrument, the questionnaire was administered two weeks later (test–retest reliability). The correlation between two items was assessed on the basis of the intra-class coefficient. An intra-class correlation coefficient of less than 0.4 was considered poor; between 0.4 and 0.75, fair; and greater than 0.75, excellent.[24]

Figure 1 summarizes each stage of the development and validation of the questionnaire.

Results

Patient demographics

The response rate to the questionnaire was 74.5 % (942/1200). The average age of the patients was 36.6 years (SD = 13.7, range = 20 years–88 years). Nearly 57% were females (Table 2). The patients had a wide range of conditions ranging from respiratory problems, cardiovascular problems, gastrointestinal tract problems, eye problems, ear problems and others representing 31.1%, 16.6%, 10.0%, 5.4%, 4.0% and 28.7%, respectively.

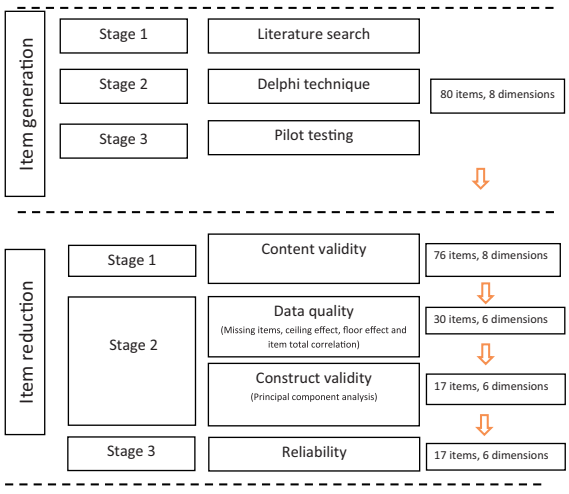

Figure 1. A flow chart depicting the process used to develop and validate the NIOPDSS.

Content validity

Based on the expert group review, it was suggested that item number 6 'facilities for persons with disabilities' should be changed to the more specific, 'separate ramp/wheel chair available for person with disabilities'. Item number 48 (doctor took little time for examination**)** and item number 76 (photostat facility available in the hospital) were deleted by the experts. This was based on the idea that patients often want longer consultations with doctors and very few of them would make use of a photostat facility in the health centre. Item number 67 ('the treatment I got was expensive') was deleted as it was non-specific with no way of deciding whether a treatment was expensive or inexpensive. It was also decided to delete item number 80 ('presence of *Rastriya Swasthya Bima Yojana* or National Health Insurance Programme RSBY facility' – a social insurance for poor people in India) as it was felt to be contextually irrelevant because not all hospitals have such a facility. Experts agreed to change the term 'reception centre' to 'registration centre' as it was more contextually relevant. Another item, 'doctor gave me clear advice' was changed to 'doctor gave me clear advice of dosage and timing of medicines'. Some items were reverse scored, so that higher values indicated higher satisfaction (e.g. item number 26 was changed from 'patient had to wait a long time' to 'patient had to wait little time'). This exercise resulted in dropping four items from the scale and rewording a few. The content validity index of the reduced item scale (76 items and eight dimensions) was 0.79 which was acceptable according to conventional criteria (Table A in Supplementary material online).[20]

Data quality

Screening of responses for data quality led to discarding 22 items because of a higher than acceptable percentage of missing data plus floor and ceiling effects. Another 24 items were deleted because of low corrected item – total statistics ($r = <0.3$). This exercise resulted in an overall reduction of items from 76 to 30 and in dimensions from 8 to 6 (Figure 1).

Construct validity

Principal component analysis was carried out on the remaining 30 items. Sampling adequacy measured by KMO test was 0.82, thus indicating the relevance of the factorial model. Six factors in the questionnaire had Eigenvalues > 1, which explained 60.3 % of the variance before rotation. There were no cross-loadings between factors. The resultant summated scale had 17 items and six dimensions.

Items were grouped into 'physician parameters' (doctor gave adequate time to explain the problem thoroughly, doctor treated the patient in a very friendly and courteous manner, doctor gave me clear advise for dosage and timing of medicines, doctor listens carefully to what the patient has to say); 'waiting area parameters' (adequate sitting space, working fans and light); 'administration parameters' (convenient OPD timings, queue at the reception, separate queue for ladies, short waits before doctor consultation); 'location of health facility' (easy accessibility, convenient location); 'pharmacy services' (medicine availability, little time to dispense medicines, pharmacy personnel explain the drug dose) and 'basic facilities' (drinking water, toilets and cleanliness) (Table 1).

Item convergent and divergent validity

The final 17-item scale met the criterion for item convergent validity (item-scale correlations of ≥ 0.40), and discriminant validity (88.3 % of the item-scale correlations (adjusted for overlap) were higher with the item's own scale than with any other subscale) (Table 3).

Reliability

The dimensions of the final 17-item scale yielded Cronbach's alpha coefficients 0.72–0.93 which are satisfactory estimates. Test–retest reliability indicated stability of the instrument. Among 50 patients to whom the questionnaire was sent by mail, 42 responded. The test–retest reliability of individual dimensions in the scale ranged from 0.54 to 0.80 indicating moderate to excellent reliability (Table 4).

Table 1. Factor analysis of items in NIOPDSS.

Item no	Dimensions/items in questionnaire	Dimensions					
		Physician	Waiting area	Administration	Location	Pharmacy	Basic facilities
	Location of health facility						
1	Health institution is easily accessible	.044	.022	.167	.558	−.258	.294
2	Convenient location of health facility	.028	.055	.222	.730	−.368	−.016
5	Adequate parking space is available	−.043	.064	.104	.028	.056	−.248
	Administration						
7	Hospital timings are convenient	.005	−.007	.339	.296	.405	−.240
12	Queue at the reception counter	.128	.022	.658	−.082	.219	.323
13	Separate queue for ladies and elderly	.042	−.014	.750	.060	.185	.150
14	Personnel present at registration counter	−.123	−.032	.278	.057	−.142	−.119
15	Behaviour of registration clerk	.083	.006	.157	.273	.172	−.049
19	Registration area was comfortable						
26	Patient has to wait less before examination by physician	−.018	−.097	.815	−.107	−.219	−.213
	Waiting area parameters						
22	Sitting space was adequate and chairs were comfortable	.054	.770	−.297	.341	.100	.150
23	Fans and light working	.082	.831	−.154	.020	.110	.212
	Physician parameters						
27	Doctor gave adequate time to explain the problem thoroughly	.888	.020	−.039	.017	.030	.006
28	Doctor examines using a screen	.341	−.086	.018	.232	−.010	.258
29	Doctor examines satisfactorily	.471	−.032	.031	−.007	.189	−.130
30	Doctor treated the patient in a very friendly and courteous manner	.790	.093	.218	.130	−.368	.110
35	Doctor explains side effects of medicine	.324	−.049	.054	.139	.214	.035
42	Doctor gave advice about ways to avoid illness and stay healthy	.244	.055	−.056	−.055	.075	.145
44	Doctor gave me clear advise for dosage and timing of medicine	.786	−.413	−.019	−.044	.015	−.031
45	Doctor listens carefully to what the patient has to say	.770	−.208	.000	−.027	−.032	−.032
47	Doctor gave clear instructions about when to return	.371	.037	.040	.026	−.002	−.009
	Pharmacy parameters						
56	Pharmacy was located at convenient place	.377	.224	−.050	−.041	.234	.013
57	Personnel was available in the pharmacy	−.050	.020	−.080	−.234	−.080	.019
58	Medicines available in pharmacy	−.001	−.024	−.043	−.336	.824	.325
59	Pharmacy personnel explains medicine dose	−.077	.047	−.079	−.188	.735	.316
60	Pharmacist took little time to dispense med	.216	.296	−.140	−.057	.543	−.051
	Basic facilities parameters						
69	There was proper arrangement of drinking water	.003	.109	−.061	.157	.227	.790
70	Overall the hospital was clean	.361	.250	−.009	−.043	−.015	.848

(continued)

Table 1. Continued

Item no	Dimensions/items in questionnaire	Dimensions					
		Physician	Waiting area	Administration	Location	Pharmacy	Basic facilities
71	Toilets were clean and in usable condition	.319	.265	.011	−.031	−.040	.544
73	Telephone facility was available	.041	.018	.097	.149	−.086	.222
	Eigenvalue	6.6	3.4	2.4	2.1	1.9	1.7
	Variance	22.2	11.3	8.0	6.9	6.3	5.7
	Cumulative variance	22.2	33.4	41.5	48.3	54.6	60.3

Table 2. Main study sample and test–retest sample characteristics.

Variables	Main study, *n* (%)	Test–retest, *n* (%)
Age group(in years)		
20–30	284(30.1)	9(22.1)
30–59	490(52.0)	21(49.7)
60 and above	169(17.9)	12(28.2)
Gender		
Male	416(44.2)	18(42.2)
Female	531(56.4)	24(58.20)
Marital status		
Married	727(77.2)	31(72.7)
Unmarried/widowed/divorced	215(22.8)	11(27.3)
Accommodation		
Own house	294(31.2)	14(33.2)
Rented	642(68.1)	28(66.7)
Others	07(0.7)	0(0.0)

Discussion

The NIOPDSS (Box 1) is a reliable and valid tool for measuring patient satisfaction with OPD services at health facilities in North India. The approach used to develop the questionnaire was based on an extensive literature review, followed by expert Delphi consultations. Location of the health facility, administration, the waiting area, physician, pharmacy and basic facilities emerged as important dimensions of patient satisfaction in India. These dimensions are in concordance with similar studies carried out in India[14–17] and other developing countries,[12,14] but have never been consolidated into a single comprehensive tool.

There was a high rate of missing data for two dimensions (laboratory and dressing room services) in the initially devised 80-item scale which were subsequently deleted. A possible explanation of the high missing data rate is that not all the patients are referred for a laboratory investigation and further very few would require dressing. Thus, these dimensions may not be relevant to most of the patients attending OPD in this part of the world. However, we feel that these items provide important information for those who access these services. Therefore, one item relating to behaviour and services provided by the laboratory and the dressing room are suggested for inclusion in the optional segment of the scale, not for scoring.

Multitrait analysis suggests that the scale has high convergent (100%) and discriminatory validity (88.3%).The items which showed poor discrimination could be because of interdependent dimensions of this

Table 3. Item scale correlations for multitrait scaling analysis of NIOPDSS.

Dimensions	Physicians	Waiting area	Administration	Location	Pharmacy	Basic facilities
Location						
1	0.39	0.39	0.20	**0.54**	0.16	0.23
2	0.16	0.16	0.21	**0.79**	0.27	0.24
Administration						
12	0.43	0.29	**0.41**	0.36	0.11	0.17
13	0.16	0.55	**0.58**	0.39	0.31	0.22
26	0.23	0.45	**0.41***	0.33	0.32	0.24
Waiting area						
22	0.12	**0.87**	0.3	0.4	0.11	0.14
23	0.2	**0.78**	0.35	0.36	0.14	0.17
Pharmacy						
58	0.21	0.42	0.3	0.15	**0.84**	0.25
59	0.22	0.29	0.31	0.15	**0.65**	0.21
60	0.1	0.34	0.49	0.21	**0.44***	0.13
Physicians						
27	**0.56**	0.28	0.49	0.36	0.21	0.09
30	**0.87**	0.38	0.35	0.41	0.2	0.24
44	**0.77**	0.41	0.24	0.36	0.21	0.15
45	**0.56**	0.28	0.49	0.36	0.21	0.09
Basic facilities						
69	0.22	0.26	0.40	0.16	0.2	**0.45**
70	0.24	0.35	0.32	0.33	0.17	**0.77**
71	0.18	0.42	0.11	0.27	0.24	**0.78**

Corrected item scale correlations are in bold.
None of the items failed to meet the corrected item – total correlation criteria ≥ 0.40.
*Failed test with item discriminant validity, where an item correlated higher with a scale other than its own.

Table 4. Internal consistency and test–retest reliability in the NIOPDSS.

	Internal consistency reliability (Cronbach's alpha)	Test–retest reliability (intra-class correlation coefficient)
Location of health facility	0.93	0.80
Administration	0.80	0.62
Waiting area parameters	0.80	0.56
Physician parameters	0.72	0.59
Pharmacy parameters	0.74	0.66
Basic facilities parameters	0.78	0.52

newly developed scale. For example, the patients may have perceived 'pharmacist took little time to dispense medicines' to be an issue related to administration and not the pharmacy. Similarly, the item, 'short waiting time before doctor consultation' although listed under the administration heading may well have been perceived as a waiting area parameter by the study participants. The fact that we obtained acceptable test–retest reliability suggests that the instrument might be used other than immediately after hospital treatment.

The dimensions of satisfaction identified in our study were consistent with studies worldwide. Specifically, studies by Gasquet et al.[25] and Westaway et al.[26] have ranked physician interaction, waiting time and waiting area cleanliness as important parameters of patient satisfaction. Granado et al.[27] identified the administrative quality of a health facility as a domain affecting patient satisfaction. Garatt et al.[28] listed ease of access to the health facility along with staff communication with patients as factors related to patient

Box 1. NIOPDSS.

Dear patient you have received OPD services satisfactory questionnaire at this health facility. Please take some time and fill this questionnaire. Please record your satisfaction with each of the items in the following questionnaire: Please write 9 if you have no opinion:

1 = Strongly agree 2 = Agree 3 = Neutral 4 = Disagree 5 = Strongly disagree

1. Health institution is easily accessible	1	2	3	4	5
2. Health institution is convenient located	1	2	3	4	5
3. Queue at the reception counter	1	2	3	4	5
4. Separate queue for ladies and elderly	1	2	3	4	5
5. Less waiting time before doctor consultation	1	2	3	4	5
6. Adequate sitting space and chairs comfortable in waiting area	1	2	3	4	5
7. Fans and light in working order in waiting area	1	2	3	4	5
8. Doctor gave adequate time to explain the problem	1	2	3	4	5
9. Doctor treated me in a very friendly and courteous manner	1	2	3	4	5
10. Doctor gave me clear advise for dosage and timing of medicine	1	2	3	4	5
11. Doctor listened carefully what I had to say	1	2	3	4	5
12. Medicines available in pharmacy	1	2	3	4	5
13. Pharmacist explained medicine dosage	1	2	3	4	5
14. Pharmacist took little time to dispense medicine	1	2	3	4	5
15. Drinking water available in health facility	1	2	3	4	5
16. Toilets are clean and in usable condition	1	2	3	4	5
17. Overall cleanliness of hospital	1	2	3	4	5

satisfaction. However, Grogan et al.[29] mention clinic appointments affecting patient satisfaction, which did not appear to be relevant in the government health care context in India where only a miniscule proportion of patients are given appointments. However, this trend is rapidly increasing in the private sector. Studies by Aletras et al.[30] in Greece and Krowinski and Steiber[31] in Chicago have listed hospital environment items like comfortable waiting areas, waiting times for visiting the clinic and a fair queuing system as important validity constructs.

The main strengths of this new scale are the involvement of experts and administrators from a premier health care institution in India in its development and the high validity and reliability of the resulting tool. A limitation is the generalizability of the scale in health care facilities in other parts of India and other developing countries. However, good test–retest results, acceptable validity and reliability and sample diversification in the study are likely to have improved the generalizability of instrument. A further limitation of the tool is that the patient's perspective was not taken into account during development of the questionnaire.

Supplementary Material

The online table is available at http://hsr.sagepub.com/supplemental-data.

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