RESEARCH ARTICLE

# Developing a Psychometric Scale for Brief Evaluation of Outpatient Satisfaction

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## Abstract

**Background and Objectives:** Patient satisfaction is a key feature of quality improvement in modern health care systems. The focus of patient satisfaction studies has been on inpatient satisfaction measurement. As such, valid and reliable instruments for assessment of outpatient satisfaction are lacking in the field. This study aimed to develop and validate a brief scale to facilitate assessing outpatient satisfaction.

**Methods:** Based on the existing literature and patient interviews, an initial pool of 20 items was generated. Item analysis and principal components analysis were carried out to evaluate the psychometric quality of items. Internal consistency of the instrument was evaluated by calculating Cronbach's alpha for the whole scale and subscales.

**Findings:** Results supported the appropriateness of all items. Moreover, principal components analysis using Varimax rotation yielded a four-factor solution. Reliability coefficients of the subscales were within the acceptable range. The existing brief 20-item scale was developed with four subscales of staff, physician care, clinical atmosphere, and overall satisfaction.

**Conclusions:** Therefore, this brief scale may be served as a valid and reliable instrument in clinics, hospitals, and research settings.

**Keywords:** Psychometrics; Patient satisfaction; Outpatients; Reliability and validity; Factor analysis; Quality improvement; Scale development

## Background and Objectives

Assessment of patient satisfaction is of absolute importance in order to improve the quality of healthcare services [1, 2]. Patient satisfaction aspects differ from country to country, and its content also depends on many patient characteristics such as age, gender, educational level and socio-economic status [3]. Furthermore, the evaluation of patient satisfaction includes methodological difficulties [4].

The research literature on patient satisfaction is diverse. As Hall and Dornan [5] noted in their review of the satisfaction research literature, the aspects of the medical setting chosen for study vary in a way that some aspects (e.g. humaneness of health professionals) are investigated extensively while others (e.g. outcomes) are assessed to a relatively lesser degree. Satisfaction is indeed a multi-factorial concept. Patients make cognitive and emotional evaluations about the process of care as well as the outcome of their treatment.

It has been reported that patient satisfaction is influenced by communications, cost, continuity of services and providers, physical environment of the hospital, humanity, information, time spent on patient, technical quality, official procedures, doctor's gender, and nursing care [6-9]. It was also reported that waiting for long times, having no alternative choices, and possessing insufficient information are the causes of

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dissatisfaction in outpatient clinics [10-12]; however, assessment of all these factors is psychometrically difficult and may result in long questionnaires. To be more realistic, it is a fact that satisfaction with service quality is based on multiple dimensions. Yet, there is no broad consensus on the nature or even content of the dimensions. Thus, evaluation of these domains is considered to be a highly complex process [13] as stated before.

Another review [14] reported that the majority of patient satisfaction studies identified in the international literature used survey instruments have been specifically designed for the study in question. This is of concern with regard to establishing reliability and validity of instruments. Achieving comparability across various settings is another problem of this manner of collecting data on patient satisfaction. Moreover, most of the utilized measurement approaches focused on specific healthcare systems, and few focused on outpatient clinics. Using inpatient satisfaction instruments for outpatient clinics raises the issue of content validity, and is methodologically questionable. Moreover, using long surveys in outpatient clinics is practically difficult as these patients may stay in the clinic for only few minutes.

Much of the activity in patient satisfaction research has focused on the experience of inpatient care; however, outpatient services account for many more patient-professional encounters than other services. Thus there is a growing need to develop systems and instruments to measure outpatient satisfaction. Undoubtedly, utilizing inpatient satisfaction surveys for measurement of outpatient satisfaction runs a high risk of yielding erroneous results [15]. Around the world, hospital managers make an effort to establish an integrated method of patient satisfaction measurement in order for quality-improvement purposes [16].

Additionally, adopting non-validated approaches of measurement is psychometrically problematic [17]. This may also lead to inappropriate data and consequently troublesome decisions in managerial levels. Measures of patient satisfaction should adhere to the basic principles of psychometric measurement [18]. Analysis of 195 studies [19] of patient satisfaction yielded that authors demonstrated a poor understanding of the importance of core measurement properties required if a measure is to assess satisfaction with confidence.

Psychometrically suitable instruments are lacking in order for accurate evaluation of outpatient satisfaction. Research literature on patient satisfaction and especially outpatient satisfaction indicates that there is a need for a very brief scale to measure out-

patient satisfaction. The primary aim of the present study was to develop and validate a brief self-report multi-dimensional scale to measure outpatient satisfaction in a valid and reliable manner with satisfactory factor structure.

## Methods

### Item generation

Considering existing literature on outpatient satisfaction in different countries, an initial item pool of 50 items was generated. Two hospital managers, two psychologists, and one physician examined the content validity of the items. All of the five raters were asked to rate the items in a 7-point Likert scale. Higher scores indicated the higher quality of the items, and lower scores suggested poor items in terms of content validity. Items with scores lower than 25 were discarded in this step. Then the authors examined remaining items, and chose 20 items to form the final item pool. Items consisted of five 4-item parts: admission, personnel, clinic atmosphere, physician care, and overall satisfaction. The response option for respondents was provided in a 6-point Likert-type scale.

### Item selection

As suggested by Nunnaly and Bernstein [20], a broad item analysis was conducted prior to Principal Components Analysis (PCA). In this step, the items' exclusion criteria were set: (a) missing more than 10% of data, and (b) having inappropriate indices of skewness and kurtosis.

### Data transformation

Questionnaires with more than five missing values were excluded from the statistical analysis. Each item was scored from 5 (complete satisfaction) to 0 (complete dissatisfaction). No reverse scoring was required. Total patient satisfaction score was calculated by summing all the items' scores.

### Factor structure

PCA was performed to identify independent components of the instrument. Kaiser-Meyer-Olkin (KMO) measure was calculated to evaluate sampling adequacy. Bartlett's test of sphericity was also performed. Components with eigenvalues greater than one (EGV-1 criterion) were rotated using the Varimax procedure,

and loadings under 0.4 were suppressed.

### Reliability

Cronbach's alpha coefficient was calculated to assess the internal consistency of each subscale and total scale as a measure of reliability.

### Procedure

A total number of 246 participants were given a questionnaire consisting of the above-mentioned 20-item scale (Brief Outpatient Satisfaction Scale, BOSS) and demographic details. Demographics were age, gender, marital status, educational level, Socio-Economic Status (SES), reason of admission, and admission time. The verbal consent of all participants was obtained before administering the questionnaires in the clinic. Moreover, all respondents were assured of the confidentiality of their responses.

### Statistical analysis

Data entry and analysis were performed in a blinded manner by personnel who were not involved in the process of data collection. Statistical analysis was performed using SPSS 22. Finally, one-way Analysis of Variance (ANOVA) was used to evaluate total satisfaction among different groups derived from the demographic details.

## Results

Initially, 246 questionnaires were obtained; however, after meeting the exclusion criteria for participants, 208 valid questionnaires were included for statistical analysis. Demographic characteristics of the outpatients are summarized in Table 1.

### Item analysis

Item analysis provided all items with appropriate characteristics. All items' indices of skewness and kurtosis were within acceptable range; therefore, no item was discarded in this step.

### Factor structure

PCA was performed on the response set of 20 items. The KMO measure of sampling adequacy was 0.911. Since the minimum value of this measure for adequa-

**Table 1    demographic characteristic of the respondents**

| Variable | N | % |
|---|---|---|
| Gender *(n=205)* | | |
| Male | 94 | 45.8 |
| Female | 111 | 54.2 |
| Age *(n=200)* | | |
| 30 or younger | 51 | 25.5 |
| 31-40 | 48 | 24.0 |
| 41-50 | 36 | 18.0 |
| 51-60 | 35 | 17.5 |
| > 61 | 30 | 15.0 |
| Marital status *(n=202)* | | |
| Single | 59 | 29.2 |
| Married | 143 | 70.8 |
| Educational level *(n=203)* | | |
| High school or lower | 78 | 38.4 |
| Associate's degree | 31 | 15.3 |
| Bachelor's degree | 67 | 33.0 |
| Master's degree or higher | 27 | 13.3 |
| Socio-Economic Status *(n=198)* | | |
| Low | 23 | 11.6 |
| Moderate | 148 | 74.7 |
| High | 27 | 13.7 |
| Admission shift *(n=177)* | | |
| Morning | 96 | 4.2 |
| Evening | 81 | 45.8 |

cy of data matrix for factorability is 0.6 [21], it could be concluded that data matrix had the required assumptions for factor analytic purposes. Bartlett's test was also significant. These tests suggest the factorability of the instrument. Four components had eigenvalues greater than one. These components were labeled: *staff, overall satisfaction, physician care,* and *clinic atmosphere*, which components accounted for 39.5%, 10.8%, 7.7%, and 5.1% of the total variance, respectively. Thus, 63.1% of the total variance was explained via these four components. Within the results of 20 items, only three items had cross-loadings. Loadings of the items on the components are presented in Table 2.

### Reliability

The alpha coefficient of the scale was 0.91. Descriptive data, reliability coefficients, and item-subscale coefficients of the subscales are presented in Table 3.

**Table 2    Loadings of items on their related subscales**

| Staff (8 items) | | Overall (4 items) | | Physician (4 items) | | Atmosphere (4items) | |
|---|---|---|---|---|---|---|---|
| Item | Loading | Item | Loading | Item | Loading | Item | Loading |
| 13 | 0.745 | 18 | 0.794 | 4 | 0.848 | 8 | 0.750 |
| 1 | 0.733 | | | | | | |
| 2 | 0.709 | 19 | 0.765 | 9 | 0.838 | 11 | 0.532 |
| 10 | 0.655 | | | | | | |
| 12 | 0.643 | 17 | 0.735 | 7 | 0.818 | 15 | 0.459 |
| 14 | 0.604 | | | | | | |
| 3 | 0.574 | 20 | 0.650 | 16 | 0.807 | 5 | 0.419 |
| 6 | 0.540 | | | | | | |

### Further analysis

Pearson's correlation coefficients between some demographic characteristics and four subscales of the instrument are present in Table 4. One-way ANOVA detected no significant difference in satisfaction of patients in gender, marital status, education, and socio-economic status ($P > 0.05$); however, those patients who were admitted in the evening were significantly more satisfied ($F = 5.89$; $P < 0.05$).

**Table 3    Descriptive data, item-total correlation coefficients, and internal consistency of subscales**

| Subscale | Item | Mean | SD | Corrected item-total correlation | Alpha coefficient |
|---|---|---|---|---|---|
| Staff | 13 | 4.39 | 0.630 | 0.629 | 0.82 |
| | 1 | 4.46 | 0.554 | 0.618 | |
| | 2 | 4.49 | 0.674 | 0.499 | |
| | 10 | 4.43 | 0.637 | 0.606 | |
| | 12 | 4.52 | 0.587 | 0.549 | |
| | 14 | 4.36 | 0.672 | 0.556 | |
| | 3 | 4.40 | 0.680 | 0.488 | |
| | 6 | 3.61 | 1.393 | 0.499 | |
| Overall satisfaction | 18 | 4.31 | 0.711 | 0.668 | 0.89 |
| | 19 | 4.38 | 0.775 | 0.696 | |
| | 17 | 4.26 | 0.780 | 0.696 | |
| | 20 | 4.32 | 0.724 | 0.729 | |
| Physician care | 4 | 4.16 | 1.040 | 0.482 | 0.89 |
| | 9 | 4.25 | 1.001 | 0.638 | |
| | 7 | 4.50 | 0.951 | 0.604 | |
| | 16 | 4.26 | 0.967 | 0.582 | |
| Clinic's atmosphere | 8 | 4.18 | 0.847 | 0.429 | 0.67 |
| | 11 | 4.27 | 0.769 | 0.487 | |
| | 5 | 4.44 | 0.634 | 0.407 | |
| | 15 | 4.23 | 0.725 | 0.477 | |

**Table 4  Correlation coefficients between demographic variables and subscales**

|  | Age | Education | SES | Staff | Staff | Physician | Atmosphere |
|---|---|---|---|---|---|---|---|
| Age | 1 | | | | | | |
| Education | -0.212** | 1 | | | | | |
| SES | 0.330 | 0.386** | 1 | | | | |
| Staff | -0.151* | 0.029 | 0.036 | 1 | | | |
| Overall | -0.075 | -0.041 | -0.036 | 0.626** | 1 | | |
| Physician | -0.170* | -0.061 | -0.087 | 0.433** | 0.523** | 1 | |
| Atmosphere | -0.083 | -0.136 | -0.081 | 0.410** | 0.480** | 0.233** | 1 |

*Significant at P < 0.05 level
**significant at P < 0.01 level

## Discussion

This study aimed to develop and undertake preliminary psychometric evaluation of a new measure of outpatient satisfaction. A 20-item scale comprising of four subscales was developed with good internal consistency and adequate indices of validity. Assessing outpatient satisfaction relating to staff, physician care, overall satisfaction, and clinic atmosphere subscales will allow quality-improvement executives to set a plan in order to improve the quality of services in an operational manner.

The findings of this study are consistent with a study based on grounded theory (GT) [22], which findings identified service quality dimensions through open coding, axial coding, and selective coding. The analysis was done for the assessment of overall satisfaction, and four dimensions of *doctors, quality of care, nursing care,* and *operative quality of care* were identified. While the current results do not precisely replicate those findings, they are quite consistent in terms of content validity.

The authors expected a five-factor solution from the PCA; however, a four-factor solution was obtained. Three emerged factors were consistently matched with the initial taxonomy of expected subscales. Items pertaining to admission and personnel were anticipated to form two distinct factors though they were loaded on a single factor, which was then labeled as "staff". This subscale appears to measure satisfaction with all staff members. Interestingly, in some inpatient satisfaction scales [23], satisfaction with different staff members is clearly distinct. It may be explained by the fact that interaction of a typical outpatient with various nurses and admission personnel in outpatient clinics is limited; however, the distinction of interactions of a typical inpatient with different staff mem-

bers in his/her stay is clearer.

The items in *satisfaction with physician care* subscale were especially designed to cover potential Doctor-Patient Relationship (DPR) components. It has been suggested that an ideal DPR has six components, namely voluntary choice, doctor's competence, good communication, empathy by the doctor, continuity, and no conflict of interest [24]. It has been reported that poor DPR may simply result in lowered satisfaction of patients [25]. As the current scale was meant to be brief, the most crucial aspects of DPR were incorporated into the "physician care" subscale. As stated before, this subscale showed high level of internal consistency and may be considered a point of strength in the developed instrument.

Furthermore, the alpha coefficient was calculated to assess the internal consistency of the scale though, test-retest approach was not utilized due to some irregularities reported in previous studies [26]. Another reason for not using test-retest approach was inaccessibility of the patients after discharge. The total Cronbach's alpha was high, and supported the reliability of the developed instrument. Internal consistency of the four subscales was also satisfactory.

Demographic data provided no evidence for significant difference of satisfaction among gender, marital status, educational level, and socio-economic status. Moreover, there was a significant difference between the morning and evening admissions, suggesting that those referring in the evening admission were more satisfied with services. This may have multiple reasons. First, it might be because of different shifts of staff and their behavior. Second, patients who refer in the morning shift are either unemployed or have left their job for several hours for treatment. Therefore, they might hold higher expectations of clinical services. Though, replication of this finding in various

settings may bring to light more in this respect.

Given the exploratory nature of this study, further validation of this scale is required and strongly recommended. Since this scale has been developed upon data from one hospital, assessment of its psychometric properties in other settings may facilitate its application. It may also result in somewhat different factor structure because of the nature of items in the first subscale.

Few limitations of the current study are worth noting. First, although an interpretable factor structure was found, it is unlikely that this scale captures all relevant domains of outpatient satisfaction. For instance, this scale does not measure satisfaction with labs, radiology staff, and pharmacy [27]. The authors believe that satisfaction with those sections should be assessed in a different manner with specifically designed instruments as they may not be required for all outpatients. Second, the used sampling method was convenience sampling. Utilizing probability sampling strategies with larger samples can be of great help to assess external validity of the instrument in future research [28].

## Conclusions

While the development of the brief outpatient satisfaction scale (BOSS) is at its preliminary stage, with continued research and development, this scale may be utilized as a valid and reliable instrument in outpatient clinics, hospitals, and research settings.

### Abbreviations

(PCA): principal components analysis; (KMO): Kaiser-Meyer-Olkin; (SES): socio-economic status; (BOSS): brief outpatient satisfaction scale; (ANOVA): analysis of variance; (DPR): doctor-patient relationship

### Competing Interests

The authors declare no competing interests.

### Authors' Contributions

MA designed the study, conceptualized the instrument, and collected the data. HB provided methodological suggestions and statistical guidance. MA was involved in interpretation of results and drafting the manuscript. All authors approved the final manuscript.

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