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Validity and Reliability of Psychological Properties of Najmiyeh Inpatient Satisfaction Questionnaire (NISQ)

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Abstract

Aim: Patients' satisfaction (PS) is a dominant concept in medical care, due to the gap in the literature on Persian version of PS instruments, this study has conducted with aim to analyze the validity and reliability of self-designed Najmiyeh Inpatient Satisfaction Questionnaire (NISQ).

Methods: This study was carried out on 247 inpatients that came in Najmiyeh subspecialty hospital in Tehran (the capital city of Iran) during year 2011 who were selected by proportional stratified sampling method.

Statistical analysis used: In this study, after checking content validity we used confirmatory and explanatory factor analysis and Cronbach's Alpha in order to examine construct validity and reliability, respectively. SPSS (version18) and AMOS (version 20) programmer were used to analyze data.

Findings: Samples consisted of 247 subjects (222 women (90%) and 25 men (10%)). The explanatory factor analysis showed 5 factors with 64% total variance and 0.91 Kaser-Meyer-Olkin Index, the result also confirmed with confirmatory factor analysis (PNFI=0.71, RMR=0.03, PCFI=0.76). Extracted factors consisted of: "satisfaction from nursing services and their behaviour", "satisfaction from one's doctor", "satisfaction from inpatient department", "companions' satisfaction", "satisfaction from one's room". Also the questionnaire's reliability was 0.96 using the Cronbach's Alpha method.

Conclusions: Because validity and reliability indexes of NISQ were reported in suitable range, we can confirm that this questionnaire is a valid and reliable tool for measuring inpatient satisfaction.

Keywords: Inpatient Satisfaction, Reliability, Validity, Questionnaire

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Introduction

One of the ways of control and evaluation the health service is to investigate patients' satisfaction (PS) [1]. Therefore, PS has been regarded by health and medical care organizations as an important index of health service quality nowadays [1, 2], and it is in the spotlight as an indicator of increasing interest of health guardians toward using patients' evaluation of health systems [3], and its measurement has significantly helped health and medical organizations to improve and enhance their quality [4]. Also, PS with health care is predictive of future behaviours, including treatment compliance and intent to return for care [5]. Thus, patients' perception of health care has gained increasing attention over the past 20 years [6]. PS questionnaires are the most commonly used method for the assessment of patient perceptions [7]. However, like any other psychological variable in evaluating PS, we need to hire appropriate instrument.

There are several tools available in the field of PS evaluation, such as La Monica-Oberst Patient Satisfaction Scale (LOPSS) which consists of 41 questions and three subcategories of "Dissatisfaction", "Interpersonal Support" and "Good Impression"[8]; Risser Patient Satisfaction Scale is made up of 52 questions and three sub-scales of "Technical-Professional Factors", "Trusting Relationship" and "Educational Relationship" [9]; the 15- and 48- question scales of Patient Perception of Hospital Experience with Nursing (PPHEN) with five sub-scales of "Knowing", "Being with", "Doing for", "Enabling", and "Maintaining Belief" [10]; Labarere et al questionnaire with 30 questions and 6 subcategories of "Nursing care", "Communication", "Discharge planning/ continuity", "Physical Care", "Living Arrangement" , and "Convenience" [11]; 29-item questionnaire by Larson et al. with three sub-areas of "Assistive", "Being", and "Enabling" [12]; fourty-five-item questionnaire for Satisfaction of Hospitalized (QSH) with 9 subcategories of "Medical Staff", "Nurses' staff", "Midwives Staff", "Other Staff", "Staff Identification", "Admission", "Room Arrangement", "Food", and "Waiting Time" with two major areas of Staff and Structure [13]. Besides, there are certain questionnaires for special patients' satisfaction among which questionnaire on satisfaction with communication of the multiple sclerosis diagnosis [14], questionnaire on satisfaction of the patients hospitalized in emergency medicine department [15], questionnaire on satisfaction of stroke patients [16] and questionnaire on satisfaction of psychiatric inpatients [17] are some examples.

Most items in previous questionners have psychological base that focus more on medical staff behavior; however, according to the accreditation guideline [18], PS survey must evaluate both facilities and behavior. Due to lack of standards in these tools in Iran, this

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survey done with aim of studying the validity and reliability of self-designed Najmiyeh Inpatient Satisfaction Questionnaire (NISQ).

Subjects and Methods

This cross sectional study was conducted at Najmiyeh subspecialty hospital, in Tehran city, capital of Iran during year 2011.

The inclusion criteria were at least two days of hospitalization and being at least 18 years old while exclusion criteria were: unwillingness to continue participation in the project and failure to complete the questionnaire. The subjects were recruited using simple random sampling method.

The optimal sample size was obtained using following formula and considering $r = 0.125$ (minimum correlation between variables that was calculated using a pilot study with 30 samples) and $\alpha = 0.05$ and $\beta = 0.1$. Considering a drop-out rate of 10% the total sample size was estimated to be 247.

$$n \geq \left[\frac{\left(z_{1-\alpha/2} + z_{1-\beta}\right)}{0.5 \times \ln\left[(1+r)/(1-r)\right]} \right]^2 + 3$$

$$n \geq \left[\frac{(1.96 + 1.28)}{0.5 \times \ln\left[(1+0.125)/(1-0.125)\right]} \right]^2 + 3 = 247.28 \approx 248$$

Approval to conduct the study was obtained from the institution's ethics committee. The participants were briefed about the aim of the study and they were assured of their privacy and also informed that they could withdraw from the study.

At the first step, we reviewed the literature and designed 40 questions with 5 grade Likert scale, "Completely Satisfied", "Satisfied", "So So", "Dissatisfied" and "Completely Dissatisfied" then Content Validity Index (CVI) was determined by an expert panel of 7 members for each question. In this study, questions were accepted for final analysis if the value of its CVI were greater than 0.7. Base on this cut point and 6 questions were removed before construct validity.

The next step was the psychometric validation. We tested the questionnaire on the 243 inpatients. Construct validity was determined by the Explanatory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA).

In EFA, Principal Component Method, Varimax with Kaiser Normalization, Eigen value greater than 1 and question load greater than 0.3 were used as factor extraction, rotation method, acceptable cut point for each factors and determining each question in each factor respectively.

In CFA, Root Mean Squared Residuals (RMR) less than 0.05, Parsimonious Comparative Fit Index (PCFI) and Parsimonious Non Normal Fit Index (PNFI) greater than 0.5 were considered as CFA fit.

Stability was assessed in 247 inpatients using the Cronbach's alpha and an Cronbach's alpha value of at least 0.70.

Data were analyzed with SPSS (version 18) and AMOS (version 20). Continuous variables are presented as the mean ± SD, whereas categorical data were presented as frequency distribution and percentages.

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Results

Sample size consisted of 247 participants with response rate of 95%, including 222 women (90%) and 25 men (10%). 21 (8.3%) participants had age lower 20 years old, 182 (73.7%) subjects 21 to 40 years old and 44 (18%) subjects had age upper 41 years old. According to department sections, 25 (10%) subjects from infant section, 115 (46.7%) subjects from maternity section, 30 (12.1%) from VIP section and 77 (31.3%) from female surgery section. Regarding the participants' educational status, 46 (18.6%) hadn't finished high school, 99 (40.1%) had high school diploma, 28(11.4%) had Associated Degree, and 74(29.9%) had Bachelor degree or further education. As to the insurance type, 186 of the participants had armed forces insurance (75.3%), 36 of them enjoyed social insurance (14.5%), 9 people used medical service insurance (3.6%), and 9 were using other insurances (3.6%) while 7 people didn't have any insurance (3%). Among those using insurance, 112 (45.5%) also had complementary insurance and with regard to hospitalization background, 85 (34.4%) people had been inpatient in the past and 162 (65.6%) didn't have any record of hospitalization.

Validity

Content Validity

In this study, several methods were employed to investigate validity. In the beginning, after doing required evaluations and comprehensive review of literature on influential factors of patient satisfaction as well as studying available questionnaires [8-13], also taking the scholars' opinions into consideration, 40 questions were defined and then sent to a group of specialists. Next, Delphi method was used with three rounds and an expert panel that consisted of 7 members. In this study, questions were accepted for final analysis if the value of its CVI were greater than 0.7 [19]. Base on this cut point was 6 and questions were removed before construct validity.

Construct Validity

After investigating the content validity, the EFA and CFA were employed to investigate form validity. In the EFA by using the principle component analysis and Varimax rotation method the accordance level of the questions with the gathered factors was studied for all 247 observations. The EFA resulted in the identification of five factors with accumulative variance of above 64% and Kaser-Meyer index of 0.91, both of which are good EFA indexes. Having analyzed the explanatory factors, names were assigned to the extracted factors by using loaded values on the questions. The five elements used were "Satisfaction from nursing services and their "Behaviour", "Satisfaction from one's doctor", "Satisfaction from inpatient department", "Companions' satisfaction", "Satisfaction from one's room". A summary of the information and factor loads of the EFA is provided in Table 1. Also in order to approve the assumed factorial structure in measuring inpatient satisfaction, the contribution of each question in measuring desired parameters was analyzed by AMOS software.

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Root Mean Squared Residuals (RMR) less than 0.05 (RMR=0.03) and amounts greater than 0.5 were considered as Parsimonious Comparative Fit Index (PCFI=0.76) and Parsimonious Non Normal Fit Index (PNFI=0.71) [20]. Correlation of different aspects of the questionnaire and its total score are illustrated in Table 2.

Table 1: Scores of extracted factors from the Explanatory Factor analysis with Varimax-rotation

Percentage of accumulative variance =64.32% **KMO= 0.91** **Cronbach's alpha for total satisfaction=96%**	**Satisfaction from nurses' behaviour and service**	**Satisfaction from one's doctor**	**Satisfaction from hospitalization department**	**Companions' satisfaction**	**Satisfaction from one's room**
Percentage of Variance for each factor	14.95	14.53	14.33	12.16	8.35
Cronbach's alpha	92%	89%	90%	91%	77%
Symbol of each factor	F1	F2	F3	F4	F5
Behaviour of the hospital's security	0.635				
Informing the patients and giving required instructions at the entry time	0.362				
Behaviour of admission staff	0.705				
Waiting time since admission to become inpatient (hospitalized)	0.596				
Behaviour of one's doctor		0.633			
Doctor's experience and skill to diagnose diseases		0.670			
Doctor's punctuality in regular visits or surgery		0.757			
Ease of access to the doctor in necessity		0.790			
Providing information about one's disease and the progress of medical practices by the doctor		0.667			
Prescriptions (advice) of one's doctor before releasing		0.687			
Nurses' relationship with inpatients	0.629				
being attentive to inpatients' speech, answering their questions, etc.	0.579				
Nurses' experience and skilfulness	0.518				
Nurses' regular check-ups (monitoring) of inpatients [i.e. monitoring blood-pressure, body temperature, etc.]	0.516				
Nurses' educating (teaching) inpatients (making them familiar with medicine consumption, certain cares, etc.)	0.442				
Immediate response to inpatients calls		0.553			
Nurses' explanation prior to take action	0.337				
Respecting inpatients' privacy during nursing actions	0.430				
Behaviours of janitors and other servants			0.514		
Hygiene and cleanness of the inpatient department			0.645		
Hygiene and cleanness of the restrooms			0.674		
General hygiene and cleanness of hospital			0.677		
Regular changing of cloths, sheets, blankets, etc.			0.619		
Serenity and peaceful environment			0.719		
Facilities and equipments (TV set, chair, water-dispenser, phone, light, bed)			0.531		
Inpatients' room temperature					0.647
Facilities for inpatients' companions					0.721
Daily visit schedule				0.645	
Maintaining and quality of the diet					0.775
Food distribution				0.566	
Safety of possessions (inpatients' personal stuff or their possession related to the medical progress such as radiology images, pathology samples, etc.)				0.664	
Behaviour of releasing staff				0.769	
Behaviour of accounting staff				0.636	
Keeping turns in releasing time				0.832	

+ Scores below 0.3 are not presented.

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Table 2: Correlation among the questionnaire's subscale and total score of Najmiyeh inpatient satisfaction questionnaire

	Satisfaction from nursing services	Satisfaction from one's doctor	Satisfaction from inpatient department	Companions' satisfaction	Satisfaction from room	General/ total satisfaction
Behaviour and nursing services	1					
Satisfaction from one's doctor	0.74	1				
Satisfaction from inpatient department	0.75	0.62	1			
Companions' satisfaction	0.69	0.56	0.66	1		
Satisfaction from room	0.59	0.51	0.58	0.60	1	
Total satisfaction	0.92	0.82	0.89	0.82	0.71	1

Reliability

In this study Cronbach's alpha method was used to investigate reliability. The total reported Cronbach's alpha of the questionnaire was 96% which indicates the desirability of the questionnaire's reliability. The Cronbach's alpha scores for all the sub-scales of the questionnaire are presented in Table 1. According to these results, reliability index for each sub-scale has been reported at appropriate levels (77-92%).

Discussion

One of the difficulties in measuring psychological characteristics is the lack of standard and comprehensive tools. This fact resulted in inaccurate measuring of psychological features which in turn causes error in studies. For instance, in a study conducted by Jafari et al., the amount of inpatient satisfaction to nursing services at Beheshti Hospitals from Iran was reported 93.6% [21]. At the same time, in another study this amount was presented as 83% [22] . The reason for such paradoxical studies is lack of an accurate and equal measurement of inpatients' satisfaction as well as lack of evaluation.

Therefore, with consideration to the importance measuring PS, and a need for a valid and reliable tool to investigate this concept for inpatients, also defining a valid tool to identify individual differences among patients enticed us to standardize the inpatient satisfaction questionnaire at Najmiyeh hospital and to investigate its psychological features in this occasional study. Thus, we used structure validity method to check the study's validity. To this end, we employed the EFA and CFA at the first phase.

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At this stage, we made sure of the structural validity of the questionnaire by identifying five factors with accumulative variance of 64% and Kaser-Meyer index of 0.91 for the EFA as well as PCFI=0.76, RMR=0.03, and PNFI=0.71 as the index of model appropriateness for the CFA. Regarding the questionnaire's reliability, the amount of reliability index was observed at a desirable level which was a good reliability index in comparison to the similar questionnaires designed, defined and translated in this field (Range of alpha 0.7 to 0.85) [8-10, 12, 19].

Most of five extracted factors related to care givers to patients and communication with health care providers and family members showed in this hospital patient interesting to good relationship with others. Thus, for increasing PS patient-provider communication should be strengthened. Similar to these results, Nyatanga (2012) reported that communication is one of the aspects of care that patients most often complain about [23]. Thus, future research must be conducted in this area of PS.

Thus, this questionnaire can be recommended as an appropriate tool for measuring inpatients' satisfaction based on the findings of this study. The questionnaire's advantages include number of its questions that are a few and its relevant scales, its standardization for measuring inpatients' satisfaction from health service staff, and its high indexes of validity and reliability. Finally, appropriate sample size and investigation of different kinds of validity and reliability indexes of the questionnaire can be mentioned as the merits of the study whereas working in only one hospital for the sample population, not replicating the results to all the patients (i.e. both gender) due to female gender and maternity subspecialty of the hospital and not responding of some of the interviewees can be considered as the study's weak points.

Conclusion

With regard to the desirability of all the validity and reliability indexes of inpatients' satisfaction questionnaire at Najmiyeh Hospital (NISQ), this questionnaire can be used as a valid and reliable tool for measuring inpatients' satisfaction.

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