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Testing Models of Care Quality for Discharged Patients

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ABSTRACT

Background - Although there has been some research to identify the dimensions on which healthcare quality and inpatient satisfaction should be measured, the confirmation of constructs and indicators that constitute an overall care quality and satisfaction remain unclear.

Objectives – The objective is to present several models of service quality and satisfaction in healthcare for discharged patients; and to test those models in a sample of discharged patients in public hospitals in the United Arab Emirates.

Design and methods – A detailed inpatient survey (using interviews) was used. Data were collected with questionnaires from adult discharged (N = 244) in public hospitals in the UAE. Several structures are proposed and tested. Confirmatory Factor Analysis (CFA) and LISREL SIMPLIS using maximum likelihood estimation was used to estimate and test the parameters of the hypothesized models derived deductively from the previous literature.

Results – Five models (with one, two, three and four constructs) with different structures were tested using CFA. The final recommended model is based on three constructs – Quality of care, process and administration, and information. The goodness-of-fit statistics supported the basic solution of the healthcare quality-satisfaction Model

Conclusions - The model has been found to capture attributes that characterize healthcare quality in a developing country such as the UAE and could represent other modern healthcare systems. It can be used as a basis for evaluation in healthcare practices from discharged (inpatients') point of view. The study highlights the importance of patients' satisfaction with care as predictors of quality of care. The results also confirm the construct validity of the previously discussed healthcare quality Scales.

Keywords – Healthcare quality, inpatient satisfaction, confirmatory factor analysis, LISREL, UAE

Introduction

Healthcare is the fastest growing service in both developed and developing countries (Dey et al 2006). Related to this, healthcare quality and Patient satisfaction is an important health outcome and quality measure (Ygge and Arnetz, 2001; Jackson et al., 2001; Badri et al. 2005; Zineldin 2006). Indeed, it has gained increasing attention in recent years (Labarere et al. 2001). As an indicator, it could be used effectively to compare different healthcare programs or systems (Andaleeb, 2001), to evaluate the

quality of care (Rubin et al., 2003; Badri et al. 2005), to identify which aspects of a service need to be changed to improve patient satisfaction (Jackson and Kroenke, 1997), and to assist organizations in identifying consumers likely to disenroll (Weiss and Senf, 1990). Over the past few years, an overwhelming number of publications on the topic of patient/ inpatient satisfaction have appeared (Thi et al., 2002). Almost all studies stress the importance of patients' views as an essential tool in the processes of monitoring and improving quality of healthcare services. Many hospitals increasingly are adopting a patient-centered attitude (Hendriks et al., 2002). The multitudes of studies investigating patient satisfaction have used a wide range of measurement tools depending on their perspective on the definition of patient satisfaction (Al Qatari and Haran, 1999).

Although some attention has been devoted to the provision of healthcare quality, empirical research assessing an overall model of such care is quite limited (Zineldin 2006); and very few studies have explored the phenomenon from inpatients' point of view; or more specifically, those discharged patients (Lin and Kelly 1995). Extensive evaluations of activities that support healthcare quality are also comparatively rare. There is evidence that several constructs make up the overall care quality and satisfaction model (Al-Qatari and Haran, 1999; Amyx et al., 2000; Bredart et al., 2001). In addition, many researchers have called for empirical cross-cultural studies of healthcare quality and patient satisfaction (Badri et al., 2005; Al Qatari and Haran, 1999; Bredart et al., 2001; Gurdal et al.; 2000; Hiidenhovi et al., 2002; Kersnik, 2000).

The UAE healthcare system

Known until 1971 as the Trucial States, the seven emirates comprising the United Arab Emirates (UAE) have enjoyed overwhelming progress in all aspects of living, especially

healthcare. World Health Organization (WHO) statistics show the UAE to be in twenty-seventh place in a major analysis of national healthcare systems in 191 member countries. The parameters used in the survey included the overall health of the population, distribution of healthcare, responsiveness of the healthcare system, including patient satisfaction, opinions of people belonging to different economic strata about the system. Today, the Ministry of Health (MoH) runs 26 public hospitals (five new hospitals to be built), with a total bed capacity of 4100, of which 22 are general. Central to the government's strategy of bringing healthcare to the people are the 106 Primary Healthcare Centers (PHC) with a total staff of 2267 (ten new centers to be built). A new state-of-the-art general hospital, Al Rahba, opened in Abu Dhabi as part of the General Authority for the Health Services (GAHS) strategy to upgrade health services in the capital and its outlying areas. Currently, there are 28 private hospitals in the UAE. As part of its policy to encourage the involvement of the private sector in healthcare, the MoH has approved the construction of five new private hospitals to be built over the next two years. Scheduled for completion in 2010, but likely to be finished sooner, Dubai Healthcare City (DHCC) is a visionary enterprise which is already transforming Dubai into the healthcare hub of the region and the Middle East. A 300-bed university hospital, medical college, nursing school, a life sciences research center, 40 clinics, and specialized laboratories are to be eased into the 4.1 million square feet site of the Global Village. Key to the success of the development of DHCC is the agreement with Harvard Medical School to form a joint venture in medical education and training, quality assurance, knowledge management, research and strategic planning.

Consumer knowledge and expectations have grown proportionally with the rising wealth of the population, resulting in strong societal pressure to adopt policies that satisfy heightened consumer expectations (Margolis et al., 2003). Related to this, Øvretveit (2004) highlighted the common features of the health care challenges in many developing countries, including: lack of standards which are credible, agreed and authorized by the ministry and professions, and which can be applied flexibly in different situations; a history of centralized systems of administration and an increasing use of private care. Furthermore, poorly delivered services can cause many problems such as injuries, infections and even death (Zineldin 2006). To this end, the UAE health initiatives have brought about extensive change in thinking and management of healthcare systems. In light of this, Badri et al. (2005) designed and developed a national inpatient satisfaction questionnaire to be used in public and private hospitals in the UAE. Stringent psychometric processes were utilized to establish reliability and validity. Against this background, the purpose of this study is to first, propose a model for healthcare quality and discharged patient satisfaction; and ultimately, to use multivariate techniques to empirically test (confirm) the pre-specified relationships.

Theoretical Model and Background

Most empirical research in care quality and patient satisfaction are exploratory in nature (Andaleeb, 1998). Usually, exploratory factor analysis is utilized to suggest related dimensions. Previous research revealed a number of indicators determining the nature of the interrelationships between quality of health care and patient satisfaction.

Satisfaction and Service Quality

Satisfaction

Although there seems to be a consensus in the literature that satisfaction and service quality are unique constructs, distinctions in their definitions have not always been made clear (Choi et al., 2004; Tomiuk 2000). Oliver (1981) defined satisfaction as “the summary psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with consumer’s prior feelings about the consumption experience” (p. 27). This definition suggests that satisfaction is a consequence of, or a reaction to, expectancy disconfirmation and the resulting outcome is an affective one. In healthcare service context, Pascoe (1983) referred to satisfaction as “patients’ emotional reaction to salient aspects of the context, process, and result of their experience” (p. 189).

Basically, a patient’s satisfaction could be identified as the appraisal of the extent to which the care provided has met the patient’s expectations (Bernna 1995). In essence, according to Liljander and Strandvik (1994), satisfaction refers to an insider perspective, where there is an evaluation of the outcome, assessing what is expected and what is actually received. In short, satisfaction is an emotional response (Zineldin 2006).

In patient-focused healthcare organizations, patients and their satisfaction are considered the most crucial point in the planning, implementation and evaluation of service delivery (Edmunds et al 1987). Indeed, the patient is the center of healthcare’s quality agenda. In fact, meeting the needs of the patient and creating healthcare standards are imperative to achieve high quality (Ramachandran and Cram 2005).

Service Quality

Service quality can be used as a strategic differentiation weapon to build a distinctive advantage (Lim and Tang 2000). However, it is worthwhile discussing what exactly constitutes quality in healthcare.

Patients are known to use various aspects of medical care to evaluate the quality of services received (Choi et al., 2004; Hall and Doran 1988; Pascoe 1983). The literature on service quality delineates two rather distinct facets of the construct: (a) a technical dimension (i.e., the core service provided) and (b) a process/functional dimension (i.e., how the service is provided) (Grönroos 2000). There appears to be greater accord in the literature that service quality, on the other hand, is a cognitive construct (e.g., Choi et al, 2004; Oliver 1997; Brady and Robertson 2001). Parasuraman, et al (1988), who developed the widely used SERVQUAL scale, defined it as a judgment or evaluation relating to the superiority of the service, assuming that consumers apply a mental calculus to reach an evaluation. According to Rust and Oliver (1994), the evaluation of service quality results from specific attributes or cues related to the service, while satisfaction involves a wider range of determinants, including quality judgments, needs, and perceptions of equity. Furthermore,

Service quality and satisfaction

There is a strong link between service quality and satisfaction, to the extent that it is believed that “*quality has been defined in other consumer-oriented industries as perceived satisfaction*” (Smith and Swinehart 2001: 23). Even more, it is believed that customer service is a prerequisite for customer satisfaction (Newman et al 2001).

In general, patient satisfaction surveys are used to examine the quality of the healthcare service provided (Lin and Kelly 1995). However, the lack of clarity in the definitions of service quality and satisfaction is further linked to the ongoing controversy surrounding the causal order of service quality and satisfaction (Bitner 1990; Bolton and Drew 1991; Tomiuk 2000; Bagozzi, 1992). Although not absolute, much evidence has been documented for the service quality to satisfaction link in recent consumer satisfaction studies including those in the area of health care marketing (Brady and Robertson 2001; Gotlieb, Grewal, and Brown 1994; Rust and Oliver 1994; Andaleeb 2001).

Quality of care and satisfaction

Despite the fact that there is an extensive body of literature on the determinants of healthcare quality (Badri et al., 2005), it could be said that currently, few tools exist for assessing and managing health-care quality (Chow-Chua and Goh 2002). For example, some studies relied on Parasuraman et al.'s (1985) model to study healthcare quality (i.e. DeMan et al., 2002, Canel and Fletcher, 2001; Williams, 2000; Lim and Tang, 2000; Andaleeb, 1998). In more detail, Lim and Tang (2000) used the SERVQUAL model in Singapore Hospitals, while Jabnoun and Chaker (2003) examined SERVQUAL dimensions between private and public hospitals in UAE. Most of these studies identified criteria used by patients when they evaluate health service quality (mainly, tangibles, reliability, responsiveness, assurance, and empathy).

Also, Both Cho et al (2004), and Choi et al (2004) presented their service quality and outpatient satisfaction as a four dimensional model. They hypothesized that when assessing medical service quality, outpatients were concerned with convenience of the

care process, physician's concern for the patient, non-physicians' concern, and tangibles. They subsequently developed thirty items tapping these dimensions and were based on the interviewees' comments and the SERVQUAL scale items (Parasuraman, Zeithaml, and Berry 1985). Their suggested dimensions showed strong resemblance to the process-related factors identified by Grönroos (1983).

Meanwhile, Ygge and Arnetz (2001) developed an overall care quality model to define parental satisfaction with care based on eight dimensions of information-illness, information-routine, accessibility, medical treatment, caring process, staff attitude, participation, and staff work environment.

More recently, Suhonen et al (2006) proposed an individualized care model linking patient satisfaction with nursing care, patient autonomy and perceived health related quality of life. Their path analytic approach included some dimensions related to quality of care provided and patient satisfaction.

Even more recently, Zineldin (2006) expanded technical-functional and SERVQUAL quality models into a framework of five quality dimensions. This newly developed model is called the 5Qs model. This 5Qs model includes five quality dimensions: quality of object, quality of processes, quality of infrastructure, quality of interaction and quality of atmosphere. He admitted that although there are some common factors between SERVQUAL and the 5Qs model, the 5Qs model is more comprehensive and incorporates essential and multidimensional attributes, which are missing in the SERVQUAL model (Ibid). Three hospitals from both Egypt and Jordan were involved in the empirical research. He found that only one hospital's patients were satisfied with all five service dimensions. The other two hospitals had below-average total qualities.

Authors used different terms (items or variables) of quality indicators in healthcare. Even though, the terms were not unique, many commonalities could be identified [i.e., convenience of care process (Choi et al. 2004); concern (Choi et al. 2004); satisfaction (Andaleeb, 1998; Choi et al. 2004); value (Choi et al. 2004); communication (Andaleeb, 1998); cost (Andaleeb, 1998); facility and tangibles (Andaleeb, 1998; Choi et al. 2004); competence (Andaleeb, 1998); empathy, reliability, assurance, responsiveness by many authors]

Study objectives

As shown earlier, the literature on service quality delineates two rather distinct facets of the construct: (a) a technical dimension (i.e., the core service provided) and (b) a process dimension (i.e., how the service is provided) (Grönroos 1983). Patients are known to use various aspects of medical care to evaluate the quality of services received (Hall and Doran 1988; Pascoe 1983). Most empirical research in care quality and patient satisfaction are exploratory in nature. Usually, exploratory factor analysis is utilized to suggest related dimensions. Quality assessments of a service are not unidimensional (Choi et al., 2004). Furthermore, past studies (e.g., Fitzpatrick and Hopkins 1983; Newcome 1997) indicate that patients cannot properly evaluate the outcome of health care services and the technical competence of practitioners, since they often lack sufficient expertise and skill to make such judgments. As a consequence, patients have a tendency to infer the level of technical quality based on non-technical aspects, such as care providers' compassion and empathy, responsiveness, and coordination of care among individual health care personnel (Donabedian 1988; Ettinger 1998). Thus, the process-related factors of service take on special significance for health care consumers. However, past research

did not provide evidence on the nature and uniqueness of the different dimensions that could be considered (Badri et al., 2005; Cho et al., 2004).

As an extension of the past research on healthcare service quality and patient satisfaction, this study investigated characteristics of the linkage between the various constructs that are related to healthcare service quality and patient satisfaction. More specifically, our investigation of the nature of these linkages is based on the data collected in the UAE for discharged patients only. Therefore, this study further affords an opportunity for a cross-cultural examination of some of the existing findings in healthcare quality and patient satisfaction.

METHODS

Instrument development

Our research is based on a work performed by Badri et al. (2005). Through an extensive review of literature, they generated 147 items (prescriptions) for effective assessment of patient/inpatient satisfaction with healthcare services. Through a judgmental process of grouping similar items, they classified them into 16 categories or dimensions. Each dimensions defined an important aspects of inpatient satisfaction. The process of identifying the sixteen dimensions utilized judgments from the authors and a group of healthcare professionals. Through empirical research, they validated the proposed constructs. Their resulting instrument assessed sixteen dimensions of inpatient satisfaction with healthcare in the UAE. The aspects included *transition to home, communication, involvement, courtesy and empathy, fairness and trust, competency and confidence, information, tangibles and physical attributes, other facilities and services,*

payment matters, management rules and regulations, timely matters, waiting times and delays, responsiveness and psychological aspects, availability and accessibility, and outcome and overall assessment.

Badri et al. (2005) assured content validity through their extensive reliance on literature and consultations with experts in the field to assess the content of their questionnaire. Our study further refines their results to provide a shorter model of healthcare quality and patient/inpatient satisfaction. More specifically, their resulting constructs and items were extensively modified for its application on discharged patients. To establish content validity, the items for each dimension were critically and extensively reviewed first by professors and senior students at the UAE University. After eliminating and/or reclassifying certain items, the remaining items were subjected to a formal pretest involving a panel of experts. The panel included academics, physicians, medical consultant, nurses, administrators, technical personnel, and inpatients. Following the pretest, several discharged patients with recent experience of being hospitalized were selected for further focus group participation. Further, we reaffirmed content validity by examining the refined instrument by panel of experts in academia and healthcare; and by a focus group. A focus group of 10 members assessed the content validity of the instrument. The focus group members were asked to rate the relevance of all questionnaire items by assigning a score on a 10-point scale (1, not relevant at all; and 10, very relevant). In total, 97.56 items were assessed as quite relevant or very relevant to the scale that they were assigned to.

Face validity was assessed by sending refined copies of the questionnaire to several medical consultants asking for their views on the usefulness of the instrument. Results

showed that 38 out of 42 medical consultants (90.4%) responded. Thirty-six consultants (94.7%) felt that the questionnaire was a useful measure of inpatients' satisfaction with healthcare. All 42 consultants thought that all areas covered on the questionnaire were important; however, four (10.5%) felt that some items could be omitted, and only one consultant thought that further questions should be added.

For construct and discriminant validity purposes, we utilize a method developed by Nunnally (1994). The method evaluates the assignment of items to scales. The method considers the correlation of each item with each scale. Specifically, the item-score to scale-score correlations were used to determine if an item belongs to the scale as assigned, belongs to some other scale, or if it should be eliminated. If an item does not correlate highly with any of the scales, it is eliminated. In other words, we used correlation analysis to examine correlations of all items to all dimensions, in order to ensure that correlations of items to other dimensions were lower than correlation of items within dimensions. To ensure one-dimensional factors, we performed individual factor analysis of each of the already established factors. The analysis revealed single factors for each hypothesized dimension.

Our analysis and refinement efforts reduced the dimensions of healthcare quality and the satisfaction of discharged patients to eight specific dimensions: *tangibles and facilities*; *professionalism*; *information and involvement*; *administrative rules, processes and regulations*; *empathy and personal matters*; *competency, knowledge, trust and reliability*; *transition to home*; and *availability and accessibility*. The *tangibles and facilities* dimension included items such as cleanliness, appearances, adequacy, modernity, comfort of facilities and resources used by patients or their family members. The

professional care dimension included items such as the professionalism, respect, dignity, courtesy of services provided. The *information and involvement* dimension included items such as type and extent of communication, degree of involvement in medical decisions, and information sharing between physicians and patients or family members. The fourth dimension, *administrative rules, processes and regulations* included items covering visiting rules, procedural rules, payment and other administrative rules. The *empathy and personal matters* dimension included items related to sincerity of physician interest in patients, consistency of treatment, friendliness, and emotional related matters. The *competency, knowledge, trust and reliability* dimension included items related to patient's trust and confidence in the knowledge and know-how of care providers and their feelings of receiving competent and error-free services. The *transition to home* dimension covered items such as instruction given by physicians and other staff of matters related to exercises, symptoms, medications and dietary matters. The *availability and accessibility* dimension covered items related to availability of service providers during different times and the fair accessibility to the various care services and resources.

In their study, Badri et al. (2005) stressed the importance of empirical research over time to ultimately determine the validity of the set of critical dimensions in their model. They also stressed the importance of identifying structural models of satisfaction in healthcare for better enhancing our knowledge of causality and interrelationships between constructs. As an extension of the past research on the relationship between service quality and patient satisfaction, this study was designed to address some of the shortcomings in the existing literature by considering the hypothesized constructs simultaneously.

Many previous research attempted to list the quality of care items and have a specific item (or items) representing satisfaction. In other words, they tried to identify separate indexes representing satisfaction such as overall satisfaction (Tucker, 2002; Rahmqvist, 2001; Jackson et al., 2001). Many authors recommended measuring satisfaction with regard to each item (Sitzia, 1999; Westway et al., 2003; Mazor et al.2002; Thi et al., 2002; Margolis et al., 2003). Some authors used a combination of both. They asked for satisfaction scores for each individual item, and certain questions with regard to overall satisfaction (Thi et al., 2002). In the current research, we asked respondents to specify their level of satisfaction with regard to each item on the questionnaire by asking them the following question:

On a scale of 1 (*very dissatisfied*) to 10 (*very satisfied*), please tell us how satisfied you are with each variable (item) appearing on the questionnaire.

Participants and data collection

In this study, a survey was carried out on a random sample of 354 inpatients discharged from various public hospitals in the UAE. Through house visits and interviews, a team of research assistants carried out the distribution of the questionnaire and explained the purpose of the study to participants. They were present at all times when the participants were filling out the questionnaires. They only explained any question that needed clarification and helped in filling the questionnaires if required. On average, each questionnaire (each house visit) utilized and average of 40 minutes. Despite the fact that the difficulties of collecting sufficiently large samples for similar studies are well known (Lin and Kelly 1995), a total of 244 usable questionnaires were obtained. This sample

size is considered adequate compared with previous studies; for example, Curry and Sinclair (2002) received 134 usable questionnaire, while Lim and Tang (2000) received 252 completed questionnaires.

Statistical reliability and validity

Following previous studies (Lim and Tang 2000), and due to the fact that the dimensions used in this study are relatively new, it was necessary here to perform additional reliability tests on the dimensions. This was necessary to ensure unidimensionality of each scale and the related convergent validity. Unidimensionality is a necessary condition for reliability analysis and construct validation. We demonstrate the unidimensionality of our constructs by specifying a measurement model for each construct and by examining how well the constituting items represent the same construct. We used LISREL v8.8 to confirm each dimension. Several indexes were computed and recorded. Reliability refers to the degree of stability of the scale. It is demonstrated by checking the Cronbach's alpha for the items in each question and the correlation of the items with the criterion. The criterion variable of each construct is obtained by averaging the items in each question (the summated averages are shown in Table 1). Typically, a scale is said to be reliable if its Cronbach's alpha is 0.70 or higher (Nunnally and Bernstein 1994). Convergent validity refers to the proximity of the results of different approaches to the same problem. This is examined by using the Bentler Bonet coefficient NFI. (Bentler and Bonnet, 1980; Bentler 1990). An NFI of 0.90 or above shows strong convergent validity. Other indexes included Chi-square (χ^2), degrees of freedom and RMSEA, the p-value, Goodness of fit index GFI [GFI of 0.90 or above suggests each construct is unidimensional (Jöreskog 1970; Jöreskog and Sorborn, 2000)].

	Means	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Tangibles	6.2721	1.6305	7.07							
(2) Empathy	6.3065	1.6816	5.39	8.00						
(3) Professionalism	6.5176	1.8829	6.72	7.70	12.57					
(4) Competency	6.2938	1.8475	6.88	7.26	9.38	11.65				
(5) Involvement	6.1398	1.6330	5.37	5.98	7.57	7.30	7.11			
(6) Transition to home	6.1855	1.9541	7.01	7.66	9.50	9.67	8.18	14.58		
(7) Administration	6.2388	1.5933	4.87	5.28	6.23	6.00	4.98	6.46	6.45	
(8) Availability	5.7665	1.8713	6.71	6.92	8.56	8.86	7.21	9.65	6.02	12.26

Table (1) Means, standard deviations and the covariance matrix

Model Measurements and Data analysis

The measurement task in this study required developing a multidimensional healthcare quality measurement scale and a patient satisfaction scale. As mentioned already, for each of the eight dimensions, we scaled constructs by summing individual items on each to obtain total scores. As a result, each dimension is represented by a single score. The covariance matrix for the sample, provided in Table (1), was used to analyze the hypothesized models.

There are eight major dimensions in the models. The eight dimensions are tangibility and facilities, empathy and personal attention, professionalism, competency, availability and accessibility, administration rules and regulations, transition to home, and involvement.

However, these eight dimensions are tested to belong to one, two, or four factor structures.

The first model hypothesizes that all eight dimensions form a single construct. The second model divides the eight dimensions into two constructs. The first construct contains tangibility and facilities, empathy and personal attention, professionalism, and competency. The second construct contains availability, administration rules and regulations, transition to home, and involvement and information. The third model also divides the eight dimensions into two constructs. However, the first construct contains tangibility and facilities, empathy and personal attention, professionalism, competency, transition to home, and involvement and information. The second construct contains availability, and administration rules and regulations only. The fourth model divided the eight dimensions into three major constructs (service quality, facilities, and process management). This hypothesized model is shown in Figure 1. The fifth model divided the eight dimensions into four constructs. Table (2) provides details of each model tested by CFA.

In order to assess the fit of the hypothesized underlying factor structure, several fit indices were examined. The first is the chi-square (χ^2) statistic. The chi-square statistic is reported as a test of the model's reproduced covariance matrix to the covariance matrix found in the data. It is well documented that χ^2 statistics are very sensitive to large sample sizes, and usually significant, indicating the sample data is not an adequate fit to the hypothesized model (Byrne, 1998; Hoyle, 1995; Maruyama, 1998; Schumacker & Lomax, 1996). The χ^2 is also highly sensitive to sample size, thus frequently resulting in a rejection of the model when the model may not in fact be off-target (Mulaik et al., 1989).

Therefore, a general rule of thumb is to divide the χ^2 statistic by the number of degrees of freedom (df). If the resulting value is greater than 3.0, the model may be rejected due to poor fit (Wheaton, Muthen, Alwin, & Summers, 1977). We also used other model-fit indices, which are independent of sample size (Bagozzi & Yi, 1988; Bagozzi, Yi, & Phillips, 1991). The CFI (Bentler, 1990) was used as a measure of overall fit. The CFI has an expected value of 1.0 when the estimated model is true in the population and values of .95 or higher indicate close fit (Hu & Bentler, 1999). We also used the RMSEA (Browne & Cudeck, 1993), which assesses overall fit but also includes a penalty function for parsimony. According to Jaccard and Wan (1996), values of RMSEA $<.08$ are considered reasonable, and values $<.05$ show a close fit of the model in relation to degrees of freedom. In large samples, the null model serves as a good baseline model against which to compare alternative models for purposes of evaluating the gain in improved fit, and to establish a zero point for the normed fit index (NFI). Two additional useful indices are the goodness-of-fit index (GFI) and the adjusted goodness-of-fit index (AGFI). Because the GFI can be 'improved' by freeing up more parameters in a model, the AGFI is often cited along with the GFI, since it is designed to compensate for this increase in fit due to an increase in free parameters. The non-normed fit index (NNFI) is also useful when assessing the goodness of fit of a model. A general rule of thumb states that models with NNFI below .90 can be improved substantially (Bentler & Bonett, 1980).

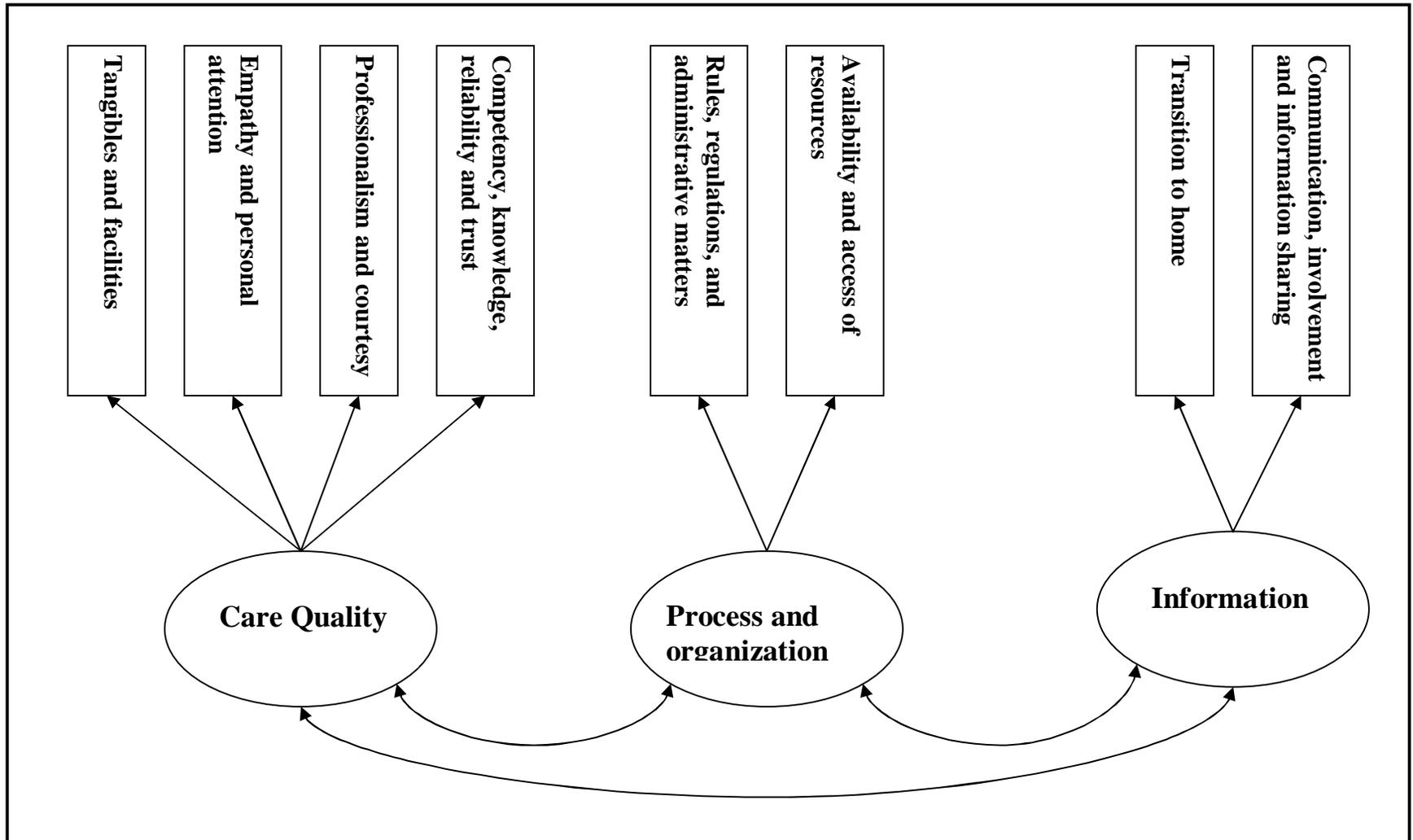


Figure (1) the conceptual model (fourth model with three constructs)

Model 1 (one construct)

Construct 1

Tangibility and facility
Empathy and personal attention
Professionalism
Competency
Availability
Administrative rules and regulation
Transition to home
Involvement and information.

Model 2 (two constructs)

Construct 1

Tangibility and facility
Empathy and personal attention
Professionalism
Competency

Construct 2

Availability
Administrative rules and regulation
Transition to home
Involvement and Information

Model 3 (two constructs)

Construct 1

Tangibility and facility
Empathy and personal attention
Professionalism
Competency
Transition to home
Involvement and Information

Construct 2

Availability
Administrative rules and regulation

Model 4 (three constructs)

Construct 1

Tangibility and facility
Empathy and personal attention
Professionalism
Competency

Construct 2

Availability
Administrative rules and regulation

Construct 3

Transition to home
Involvement and Information

Model 5 (four constructs)

Construct 1

Tangibility and facility
Administrative rules and regulation

Construct 2

Professionalism
Competency

Construct 3

Empathy and personal attention
Transition to home

Construct 4

Involvement and Information
Availability

Table (2) details for each model tested

RESULTS

Sample characteristics

The sample consisted of 244 discharged patients from public hospitals in the UAE. Male patients constituted 67%, while females constituted 33%. In a UAE culture, this breakdown is understandable since most females would rather avoid allowing strangers to enter their homes for interviews, while male patients are more welcoming. About 61.1% of respondents were married. About 56% of respondents held bachelor degrees or above, 33% held pre-college diplomas, while 10% held only high school certificates. The age of respondents ranged from 19 years old to 74 years old; with a mean of 26.15 years, mode of 25, and median of 23 years old. The hospitalization days ranged between 1 day to 360 days, with mean of 7.67 days, mode of 3 days, and median of 4 days.

Internal consistency reliability and validity

The alpha coefficients for each of the dimensions are provided in Table (3). The reliability estimates are between 0.775 (empathy and personal attention) and 0.886 (tangibles and facilities). As a result, the scales were judged to be reliable. Using Nunnally' suggested method to test construct and discriminant validity, we measures the correlation matrix for the eight scales or measures in the model. We noted that all items have high correlations with the scales to which they were assigned relative to all other scales. Accordingly, it was concluded that all items had been appropriately assigned to scales.

Dimensions and items	Number of items	Chi-square (χ^2)	Degrees of freedom	P-value	RMSEA	GFI	NFI
Tangibles and facilities ($\alpha = 0.886$)	14	81.69*	73	0.2274	0.022	0.99	0.97
Empathy and personal attention ($\alpha = 775$)	6	3.70*	8	0.8827	0.000	1.00	0.99
Professionalism and courtesy ($\alpha = 787$)	4	2.40	2	0.3012	0.029	0.99	0.97
Competency, knowledge and trust ($\alpha = 848$)	6	13.17*	8	0.1061	0.040	0.97	0.95
Rules, regulations, and administrative matters ($\alpha = 802$)	9	37.95*	24	0.1006	0.025	0.98	0.96
Availability and accessibility of resources ($\alpha = 830$)	6	14.85*	8	0.0621	0.043	0.96	0.92
Communication, involvement and information sharing ($\alpha = 883$)	13	69.13*	63	0.2782	0.020	0.99	0.98
Transition to home ($\alpha = 856$)	7	9.18*	12	0.68764	0.000	1.00	0.99

Table (3) Scale unidimensionality, reliability, and convergent validity indices

Confirmatory factor analysis

Review of literature revealed that several different factor structures may exist. It should be mentioned also that empirical studies used different questionnaire items relating care quality and patient satisfaction. We found it necessary to look into different possibilities of models with different factor structures. In order to provide construct validity evidence for hypothesized underlying structure(s) of healthcare quality and discharged patients' satisfaction, confirmatory factor analyses (CFA) were performed using LISREL 8.8 (Joreskog and Sorbom, 2000). For all five models, we used CFA to test the null hypothesis that the model of care quality and discharged patient satisfaction is (one factor, two factor (a), two factor (b), or four factor) structure. We tested the fit of each hypothesized model to determine its consistency and applicability with the sample data of discharged patients. Table (4) shows the results of the analysis. The goodness-of-fit indices suggest that the three-factor model better accounts for the data than the other four models. For this third model, the GFI is 0.97, the AGFI is 0.95, the NNFI is 0.99 and the NFI is 0.99. In addition, the RMSEA is the lowest for this model with a value of 0.045.

Models	χ^2	df	χ^2/df	CFI	GFI	AGFI	NFI	NNFI	RMSEA
One factor	32.60	20	1.630	1.00	0.97	0.94	0.99	1.00	0.051
Two factors (a)	32.60	19	1.715	1.00	0.97	0.94	0.99	0.99	0.054
Two factors (b)	29.64	19	1.560	1.00	0.97	0.94	0.99	1.00	0.048
Three factors	24.92	17	1.465	1.00	0.97	0.95	0.99	1.00	0.045
Four factors	23.88	14	1.706	1.00	0.98	0.94	0.99	0.99	0.054

Table (3) Goodness-of-fit statistics for the three measurement models tested

Hair et al (1998) pointed out that when evaluating any model's fit, no test is available that could absolutely qualify a particular fit as optimum. It is the investigator who must make the decision, assessing the different indicators as to whether the model's fit merits such a qualification. However, a good fit between the hypothesized causal model and the sample data requires that the overall model fit statistics are acceptable and that the estimates of the path coefficients meet the requirements of being statistically significant (Ibid).

In light of this recommendation, the overall assessment for all the fit parameters in the models turned out to be positive for all models (see Table 3). In general, as for the Comparative Fit Index (CFI) parameters, they went beyond the required value of 0.9 (Hair et al, 1998). The non-normed fit index (NNFI) of 0.99 and 1.00 and the Goodness of Fit Index (GFI) and Adjusted Goodness of Fit Index (AGFI) reached the recommended value of 0.9 (Joreskog and Sorbom, 1993; Mueller, 1996). Finally, the Normed Fit Index (NFI) and Root Mean Squared Error of Approximation (RMSEA) measurements reached the required fit value in each case: 0.9 for the first measurement and 0.05 for the second (Hair et al 1998). Table (4) provides details of the t-values, estimates, and standardized solution for each item with its corresponding construct.

However, much more research is needed to see whether these hypothesized factors are critical and meaningful. This study was concerned to test a measurement model for the theoretical construct of healthcare quality. The model depicted in Fig. 1 tests: (i) the relationship between inpatients' views of healthcare activities aimed at supporting patient satisfaction; and (ii) the ability of the three sub-concepts (service quality, facilities, and process management) to serve as indicator variables for inpatients' satisfaction of healthcare service quality.

	t-values	Estimates	Standardized solution
Care Quality			
Tangibles and facilities	16.19	2.24	0.84
Empathy and personal attention	16.87	2.45	0.87
Professionalism and courtesy	16.84	3.07	0.87
Competency, knowledge, reliability and trust	17.45	3.02	0.88
Process and Organization			
Administrative matters, rules and regulations	14.96	2.06	0.81
Availability and access of resources	15.52	2.92	0.83
Information and communication			
Involvement, information sharing and communication	18.21	2.51	0.94
Transition to home	16.44	3.26	0.85

Table (4) Fourth model details

On the top of all of that, the Chi-square statistics for each model had p-values above the minimum level of $\alpha=0.05$ (Hair et al 1998), and may therefore be considered significant and more desirable for the overall model. Thus, all models statistically represent a good fit. Furthermore, Root Mean Squared Error of Approximation (RMSEA) probability indicates overall model fit per degree of freedom: it is recommended that an absolute RMSEA value of less than 0.05 indicates a close fit, and less than 0.08 suggest a reasonable fit. By examining the results in the previous table, it is found that the RMSEA value is less than .05, and therefore, a close fit is indicated.

When the results obtained were examined closely, several striking points emerged from this study. First, the Communication, Involvement and Information Sharing item is attached to Transition to Home. These two items are found together in all three models. However, for the second and third models, they are combined with other variables.

However, for the first model, they form a construct by themselves. In the literature, Andaleeb (1998) emphasized that communication with patients can greatly affect the healing process. Indeed, such communication could alleviate their feelings of uncertainty and therefore eliminate the sense of being alienated.

Indeed, previous research has confirmed that if patients were given information about their condition and about how to look after themselves in future, it would help them to assume greater responsibility for their health (Bodur 2002). However, the association between these two items has rarely been seen in the previous literature. This proves the importance of these items in order to achieve the patients' satisfaction.

Second, it was found that both 1) availability and access of resources and 2) rules, regulations and administrative matters formed a construct in both the first and the third models. For the first model, these two items formed a "Process and Organization" construct. However, in the third model, they were combined with transition to home and communication, involvement and information sharing.

This goes in line with Desombre and Eccles (1998), who emphasized that in order to survive into the next decade, hospital managers will have to manage their resources better, with a consequent focus on quality management and more effective service delivery (Curry and Sinclair 2002). Also, research found that process is crucial in improving organizational quality, especially healthcare quality. In more detail, having a team to describe and improve process is the key issue in a process. Here, a process is a sequence of activities that transforms something, for example a patient's outcome or information (Øvretveit 2001).

In fact, process and organization are important in terms of explaining and describing the patient's journey (Øvretveit, Ibid) in a smooth and clear way. Also, it pinpoints where to focus and/or where to concentrate improvement efforts. This is related to the systemic level of quality, where the entire organization works as an integrated whole in order to ensure long-term success (Stahr 2001).

Finally, 1) Competency, Knowledge, Reliability and Trust, 2) Professionalism and Courtesy, 3) Empathy and Personal Attention, and 4) Tangibles and Facilities formed a construct (named Care Quality) in the first and the second model. However, for the third model, they were combined with Transition to Home and Involvement. Almost all these four items (competency, professionalism, empathy, and tangibles) were found to be closely related to customer satisfaction in a study conducted by Andaleeb (1998). Also, Zineldin (2006) found that competence, skills, attitudes, motivations and reassurances are crucial. He went further by emphasizing that these indicators should be considered very critical and important because the lack of any of these factors constitutes a poor quality of care. Indeed, it is a well-known fact that the skills of the physicians and nurses are critical factors not only in curing but also in relieving illness

In general, it is noted that with the all results obtained, the human factor is involved. Indeed, the consensus of all literature is that in a service context, people are crucial in creating the service or product and the service experience for consumers (Newman et al 2001). This was very obvious in the results obtained, as will be explained in more detail below.

The results obtained here confirm findings by Lim et al (1999) and Curry and Sinclair (2002) that there is a great stress on the manner in which care is delivered. Indeed, it is

found that human contact appears to be appreciated more than the aspects of the service determined by financial resources. It was noted that “being treated as an individual is more important by a considerable margin than getting better” (Lim et al, Ibid; 425).

However, much more research is needed to see whether these hypothesized factors are critical and meaningful. This study was concerned to test a measurement model for the theoretical construct of healthcare quality. The model depicted in Fig. 1 tests: (i) the relationship between inpatients’ views of healthcare activities aimed at supporting patient satisfaction; and (ii) the ability of the three sub-concepts (service quality, facilities, and process management) to serve as indicator variables for inpatients’ satisfaction of healthcare service quality.

Discussions and conclusions

The past decade or so has witnessed an increasing emphasis on perceived healthcare quality and patient/inpatient satisfaction in both research and practice. The objective of this study was to develop models to investigate make-up of relationships for healthcare quality and discharged inpatient satisfaction. Particular attention was paid to care quality reflected by four main variables (tangibles and physical attributes – empathy and personal attention - competency, knowledge, reliability and trust - and professionalism and courtesy); process and organization given by two major variables (availability and access of resources – and rules, regulations, and administrative matters); and information containing two variables (communication, involvement and information sharing – and level of communication during transition to home).

Several models were tested. CFA was utilized to assess each model to identify the constructs of healthcare quality and discharged patients' satisfaction. This study supported the three-factor model. However, the analysis indicated that all other four models tested provided an acceptable fit to the data as well.

This study demonstrates the complexity of testing patient satisfaction. In more detail, this study examines the different dimensions that patients use in evaluating the healthcare service quality provided in relation to satisfaction. Therefore, these dimensions could be used as indicators. Indeed, it is very important for hospital management to work with the factors that explain customer satisfaction (Andaleeb 1998). In general, a patient satisfaction survey can be a rich source of information for generating continuous quality improvements (Lin and Kelly 1995). In particular, as mentioned earlier, this quality improvement could be used as a strategic differentiation weapon to build a distinctive advantage (Lim and Tang 2000). Based on that, it is believed that the results found in this study are crucial and can help hospitals in improving their healthcare quality.

The obtained results send an important message to hospital managers, confirming that quality of care in terms of reliability (including competence, knowledge and trust), professionalism and courtesy, empathy and tangibles are crucial when it comes to evaluating the services. However, this is just part of the story, as this study confirms. This is because it was found that discharged patients also consider the process and organization in terms of availability and access to resources as well as rules, regulations and administrative matters. Finally, discharged patients care about information in terms of communication, involvement and information sharing and transition to home as crucial when it comes to evaluating the healthcare service. In general, patient satisfaction surveys

provide baseline information from which to evaluate current service quality and to plan systematically to improve service into the future (McCarthy et al 2000).

The three models obtained in this study go along with the view of Øvretveit (2001, 2004), who emphasized the importance of combining quality methods as well as the humanity side of the service, or as he called it, “the spirit of quality”. Hence, to improve patients’ perception of UAE hospitals’ service quality, managers and doctors of UAE hospitals should focus on both sides.

Future Research

This study presents a comprehensive model of service quality and satisfaction in healthcare for discharged patients. Despite the extensive validity and reliability tests that were conducted in this study, it is recommended that such tests should be repeated in different countries to ensure their validity and reliability.

Also, these models could be used to compare the performance of public against private hospitals.

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