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Measuring Nursing Service Quality in Public Hospitals

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Abstract: In the health care industry, an important playing factor that determines the quality delivered is the quality of nursing service. The aim of this research is to measure the validity and reliability of the instrument for measuring nursing service quality. Exploratory Factor Analysis (EFA) was conducted to identify the underlying structure or items of the variable of this study. Next, Confirmatory Factor Analysis (CFA) was applied to verify the relationship between the items and their respective factors. The participants of this study involves of a total of 584 nurses employed in state government hospitals. The two methods of analysis employed proved to be appropriate in this case study, producing a reliable two factors measurement model of nursing service quality. Empathy and Reliability are two elements discovered as a result of this study.

Key words: Nurses, service quality, empathy, reliability, Malaysia

INTRODUCTION

In most health-care organisations, nurses are the largest work group and form the core of the front-line staff, thus their input is fundamental in an organisation's success in delivering safe and effective care (Yin and Yang, 2002; Nayeri *et al*., 2011; Buchan and Aiken, 2008; Aiken *et al*., 2013; Nemcek and James, 2007). However, a number of studies conducted on public hospitals show evidence of increasing number of grievances on quality of services, e.g., unfriendly treatment by medical staff. The patients and their families complain that hospital personnel are impolite, haughty, unsympathetic, inhospitable and sloppy (IrM *et al*., 2011). Recognizing the important role of nurses in health care service delivery process, it is essential for the hospital management to seek out factors that can be corrected and developed in regards to nursing service quality in order to provide better service to patients. Based on that consideration, the authors of this study intend to identify the elements affecting nursing service quality in Malaysian public hospitals.

Literature review

Service quality: The last 30 years of academic literature has greatly expanded the research on Service Quality (SQ). Services are deeds, processes and performances (Zeithaml and Bitner, 2003). While the quality of tangible goods can be measured objectively using indicators such as durability and number of defects, service quality is classified as an abstract. Four traits exclusive to services distinguish them from tangible goods, namely; intangibility, perishability, inseparability and heterogeneity (Kotler, 2013). Furthermore, perception of quality is defined as the consumer's evaluation on a subject's overall merit or prestige. It is a form of attitude which distinguishes it from objective quality. Although, they are related, perceived quality cannot be equated to satisfaction, instead it results from a comparison of expectations with perceptions of performance (Parasuraman *et al*., 1988). It is widely agreed among researchers that service quality is mapped on five elements namely; reliability assurance, tangibility, empathy and responsiveness (Parasuraman *et al*., 1988). In addition, the authors have construed service quality as the degree of disparity between customers' service expectations and their perceptions of service performance. Considering the significance of the disparity between expectations and perceptions, it is in the norm that structures of this particular kind is cited as a confirmation model. Furthermore, the authors have constructed SERVQUAL, an instrument for measuring customers' perceptions of service quality in comparison to their expectations (Kotler, 2013; Parasuraman *et al*., 1988). A common technique used in the service industries, SERVQUAL is quite a familiar topic in the literature. The SERVQUAL scale has been used widely in various studies relevant in health care to evaluate customer perceptions of service quality in numerous service settings such as nursing homes (Parasuraman *et al*., 1991), colposcopy clinics (Kilbourne *et al*., 2004), nurses (Uzun, 2001) and hospitals (Martinez, 1999; Lim and Tang, 2000; Lee *et al*., 2000; Sohail, 2003; Choi *et al*., 2005; Taner and Antony, 2006).

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Health care quality: Quality care is traditionally defined as, "becomes that kind of care which is expected to maximize an inclusive measure of patient welfare, after one has taken account of the balance of gains and losses that attend the process of care in all its parts" (Donabedian, 2005). However, in a modern health care setting this definition of quality care is no longer adequate. Nevertheless, customers' needs should be prioritised, not just the values of provider (Zemke and Schaaf, 1989). This view conforms to Ovretveit's definition of quality; "fully meeting the needs of those who need the service most, at the lowest cost to organization, within limits and directives set by higher authorities and purchasers" (Ovretveit, 1992). Another study suggested two aspects of quality care, the technical aspect of care and the interpersonal aspect of care. The former refers to the competence of the providers in carrying out their routines. These include meticulousness, clinical and operating competency of the doctors and clinical outcomes. Interpersonal aspect of care is denoted by the human aspect of care as well as the socio-psychological interactions between the patient and the health care personnel. This encompasses clarifying the diagnosis and treatment to the patient, ensuring information is readily accessible, being courteous and hospitable (Chang *et al*., 1999). One unique characteristic in the health care industry is the fact that patients may not possess sufficient medical know-hows to assess the quality of the services in a hospital (Vandamme and Leunis, 1993). Thus, healthcare services can be considered a 'credence' good, an offering that consumers are unable to assess due to limited medical knowledge (Bloom and Reve, 1990). For this reason, patients' judgement tends to rely on cursory factors such as staff demeanour, patient-staff relationships and appointment reliability. These substitutes for service quality factors can be used by patients to assess service provider effectiveness (Ramsaran-Fowdar, 2008).

MATERIALS AND METHODS

The collection method used in this study was survey questionnaire. Study population consists of registered nurses employed in Obstetrics and Gynaecology and Paediatric departments in state government hospitals. To determine the sample size, this study used the recommendations suggested by Hoelter (Hoe, 2008).

He suggested a 'critical sample size' of 200, specifically for Structural Equation Modelling (SEM). Simply put, the golden rule is that any number that is above 200 is deemed sufficient to provide statistical authority for data analysis. The selection of respondents in this study was done using two sampling methods, namely area sampling and random sampling. Four state government hospitals were carefully chosen for area sampling. The survey yielded a 73% response rate, comprising of a total of 584 responses from the 800 questionnaires distributed (each hospital received 200 questionnaires). Subsequent to this, a sampling frame was constructed with the questionnaires that were brought back. By using the random sampling technique, the sample of this study was extracted by employing the "Random Sample of Cases" procedure from the Statistical Package for Social Science (SPSS) software. For this purpose a total of 316 nurses were picked and following the data-cleaning procedure, the final sample for subsequent data analysis is made up of 292 respondents. The 24 items of modified version of SERVQUAL were employed in this investigation to measure nursing service quality in the public hospital. The instrument was chosen due to the fact that the dimensions of SERVQUAL are the most frequently used variables in measuring service quality in the health care industry as reported by previous literature (Lee and Yom, 2007). In this study, nurses evaluated their own performance in terms of the service quality delivered in their hospital. Self-rating is considered a valid procedure to measure customer-contact employees' job performance and its correlates highly with other measures of performance (Boshoff and Mels, 1995). Moreover, many researches have successfully applied the perceptions of employees regarding service administration to evaluate performance (Boshoff and Mels, 1995; Snipes *et al*., 2005; Sergeant and Frenkel, 2000).

RESULTS AND DISCUSSION

Respondents' profile: About 99% of the respondent were females. This is common as nursing is a traditionally female-dominated profession. Most of respondents are Malay (91%), married (71%), aged between 25 and 34 years (57%). In terms of academic qualifications, majority of them obtained Diploma in Nursing (78%). In total, nearly 59% of the respondents had nursing experience of <10 years and only 20% of them worked as a nurse for >20 years.

Exploratory Factor Analysis (EFA): This method was applied in this research to analyse the data and to assess the number of factors to present the data effectively (Hair *et al*., 2010). By employing this method, it is possible to prove dimensionality and convergent validity between items and constructs. A number of statistical hypotheses in factor analysis need to be considered to assess the fit

Table 1: Results of examination of constructs for exploratory factor analysis suitability

Construct	KMO	Bartlett's test of sphericity (p-value)
Nursing service quality	0.938	0.000

of the items of variable for factor analysis. Foremost, the values of Kaiser-Meyer-Olkin Measure of Sampling Adequacy (MSA) should be greater than 0.50 (Hair *et al*., 2010). Second, the Bartlett's test of sphericity should be large and statistically significant at $p<0.05$ to sufficiently produce the correlations among variables and therefore deliver a justifiable factor analysis (Ho, 2006). As presented in Table 1, outcomes of KMO and Bartlett's test of sphericity meet the minimum requirement (Hair *et al*., 2010; Ho, 2006). In other words, those indicators suggest that the data were appropriate for EFA.

In order to identify how many factors needed to be gleaned, the eigenvalues of factors must be >1 (Hair *et al*., 2010; Tabacknick and Fidell, 2006) . When an eigenvalue is more than 1, it means the factor is more consequential to common variance rather than unique variance (Tabacknick and Fidell, 2006). In this study, only factors with eigenvalues more than 1 were used. Therefore all factors with eigenvalues of less than 1 were regarded as insignificant and negligible. Exploratory Principal Axis Factoring (PAF) with varimax rotation was applied to analyse the scales of nursing service quality. Varimax rotation is favoured as minimises the association across factors and maximised within the factors. This helps to extract 'clear' factors (Nunnally, 1978). In fact, this method is robust and capable of simplifying the factor loadings and validating the interpretation. Factor loading denotes the durability of the relationship between the item and the latent construct, herewith is utilised to determine the convergent and discriminant validity of the scales (Hair *et al*., 2010). A low-loading variable factor reduction process was employed to minimise the number of variables in the preliminary scale, hence creating a more durable factor structure. The greater the loading, the more the item is a pure measure of the factor (Tabacknick and Fidell, 2006). A bigger loading factor denotes a cleaner measure of the factor. Therefore, in interpreting the factors, only items with loading 0.50 and above will be considered. Factor loading in excess of 0.71, 0.63, 0.55, 0.45 and 0.32 are typically interpreted as excellent, very good, good, fair and poor respectively (Tabacknick and Fidell, 2006). Furthermore, items that have loadings more than 0.50 on one factor are held for further analysis. Items having loading less than 0.50 and cross-loaded were excluded from the analysis to make sure each item is a pure measure of the corresponding factors (Tabachnick and Fidell, 2007). Through this extraction process 14 items were eliminated. Table 2 present statistics on factor loading, eigenvalues and total variance explained for items retained in nursing service quality scales. Following the EFA analysis, the validity and reliability test are conducted using CFA which will be explained in the next study.

Table 2: Items retained in nursing service quality

Factors	Factor loading	Eigenvalues
Factor 1		
Listen to patient's complaints (S23)	0.89	
Respect patient's personality (S22)	0.87	7.662
Induce emotional comfort (S21)	0.87	
Provide courage and hope (S24)	0.86	
Understand the patient's feeling (S20)	0.85	
Help patient willingly whenever help is needed (S12)	0.72	
Factor 2		
Provide precise nursing services (S5)	0.84	
Deliver nursing service in well-equipped facilities (S3)	0.82	1.105
Provide good feeling because of appearance (S4)	0.80	
Provide skillful nursing services (S6)	0.77	

Total variance explained = 84%

Confirmatory Factor Analysis (CFA): Confirmatory Factor Analysis (CFA) includes examining the relationship between latent (unmeasured or theoretical construct) and observed (measured or indicators) variables (Tabachnick and Fidell, 2007). In this respect, CFA does not employ the outcome of statistical analysis to determine the number of factors and loadings as in EFA. For that reason, the researcher has to precisely state, the number of factors that exist within a set of variables and which factor each variable loads highly on before the results can be computed (Hair *et al*., 2010). The CFA method is considered to be a powerful tool as it considers the modelling of interactions, nonlinearities, correlated independents, measurement errors, correlated error terms, multiple latent independents each measured by multiple indicators and one or more latent independents also with multiple indicators (Byrne, 2010). Further, by including the error variance into the study model CFA is able to provide better coefficient estimates and variance analysis. One of the primary objectives of

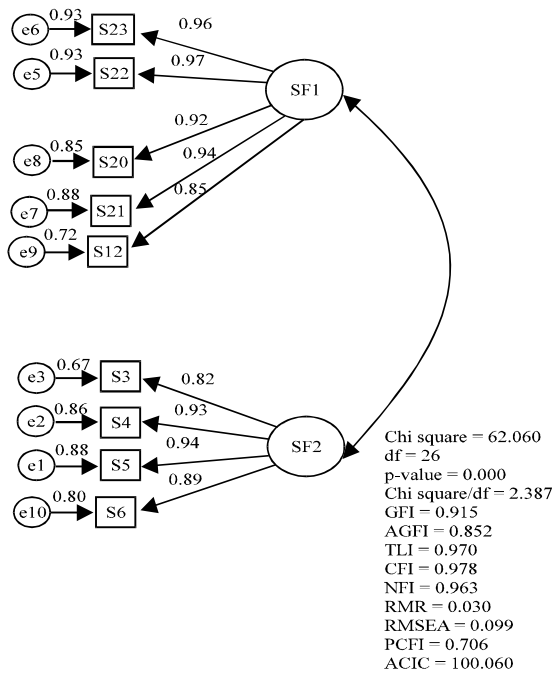

Fig 1: Measurement model for nursing service quality

CFA is to assess the construct validity of the suggested model. Strictly speaking, the CFA is used to analyse convergent and discriminant validity (Hair *et al*., 2010). Hence, for the purpose of this study CFA will be utilised to evaluate the suitability of the suggested measurement models with the sample data as well as to check the validity of in the study design. The results of the EFA were used to specify the service-quality measurement model. The final results of the model are presented Fig. 1. The value of goodness of fit indices are (GFI = 0.91, RMSEA = 0.09, CFI = 0.97, RMR = 0.30, χ^2/df = 2.387). Although, RMSEA is more than acceptable threshold of <0, since all the other goodness of fit indices for this measurement model achieved the acceptable threshold, it can be advised that the suggested model achieved a satisfactory fit. The standardised factor loading for all items were above 0.70 and the R^2 values were above 0.5, thus demonstrating these items are connected with the underlying factors (Hair *et al*., 2010). The construct reliability shows values that surpasses the approved level which is 0.70 (Hair *et al*., 2010). A high construct reliability shows that internal consistency is secured that is, the measures all consistently represent the same latent construct. The AVE values exceeded 0.50 and construct reliability was >0.70 demonstrating convergent validity (Hair *et al*., 2010). In summary, the CFA results showed good results with regard to fit indices, unidimensionality, convergent validity and reliability. This suggests that the values were sufficient to prove the suitability of the model to the data. Hence, this suggests that there is valid and substantial support for the nursing service quality model. The two factors identified from the measurement model were labelled as "Empathy" and "Reliability". Findings of the study suggested that nurses who are able to deliver high nursing service quality are providing empathy services such as respect patients' feelings, listen to patient's complaints, able to induce emotional comfort and will readily assist patients at all times. They are also portrayed as providing reliable services such as giving precise and competent nursing services, providing nursing services in well-resourced facilities and promoting positive sentiments by having good appearance. The finding of this study suggest that there are two elements that explain health care service quality in Malaysia: Empathy and Reliability are consistent with the previous studies in health-care sector (Lim and Tang, 2000; Taner and Antony, 2006; Bloom and Reeve, 1990). Furthermore, the identification of empathy and reliability as factors in explaining service quality in health care is consistent with the Kano Model (Cheng *et al*., 1999). The researchers suggested that the quality of care may be linked to the peripheral requirements of the Kano model. This includes the interpersonal side of care which is the mode in which medical care is administered. Additionally, the authors also conclude that the interpersonal aspects of care is most appreciated by patients customarily and this factor is regarded as paramount in judging the quality of nursing service.

CONCLUSION

The outcomes of this study suggest an essential message to hospital managers and nurses: be helpful, induce emotional comfort, listen to the patient, be reliable, provide skilful and precise services and most of all, respect patients' feelings. This finding shows that hospital managers and nurses should focus their attention on interpersonal aspects of nursing service quality, "how it is done". Therefore this study propose that in order to improve nursing service quality in Malaysia, managers and nurses need to place emphasis on the interpersonal characteristics contained within the elements of empathy and reliability.

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