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Structural Equation Modelling of Service Quality and Corporate Image that Affect Customer Satisfaction in Private Nursing Homes in the Bangkok Metropolitan Region

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ABSTRACT

The reduction in the total fertility rate and the labour force age along with the rise in older persons' global share, caused increasing demand of older persons using long-term care. Nevertheless, some caregivers for older people in nursing homes had restrictions on their response to older persons' requirements and entrepreneurs could not adequately provide staffs for the demands of the elderly. This led to a decrease in customers' confidence in the service quality of nursing homes as the main problem of this study. This problem influenced both corporate image and customer satisfaction. The study researched and developed structural equation modelling of service quality and corporate image that affected customer satisfaction with private nursing homes in the Bangkok metropolitan region. Samples consisted of private nursing homes' service users who were 60 years old or above and their relatives for three months or more. The 219 samples were compiled from 20 private nursing homes in Bangkok, Nonthaburi and Pratum Thani provinces from April to October 2013. Exploratory factor analysis, confirmatory factor analysis and structural equation modelling were used for data analysis. The findings from data analysis indicated that there were significantly direct effects from service quality on customer satisfaction in private nursing homes. There was also a significant impact from service quality on corporate images of private nursing homes. However, there was no direct relationship found between the corporate images and customer satisfaction.

Key words: Long-term care, nursing home, customer of nursing home, service quality, corporate image, customer satisfaction

INTRODUCTION

The global population has been undergoing meaningful ageing the process that causes the increasing share of older people in all populations, since the middle of the twentieth century. Ageing began earlier in the more developed countries and is starting to happen in some developing nations, sometimes including a quick decrease in fertility mainly in Asia and Latin America. The world proportion of the elderly (aged 60 years or over) rose from 9.2% in 1990-11.7% in 2013 and should continue to increase arriving at 21.1% by 2050. The number of these older persons was 841 million people in 2013 and will be more than 2 billion in 2050. Currently, around two-thirds of the world's older people live in the developing countries. In 2013, the country with the highest

proportion of older people was Japan (32% of the population) and in Asia (excluding Japan), Hong Kong, China had the greatest share of older people (19.9% of the population). For Thailand, the percentage of older people was 14.3, the fourth highest rank of Asia (UN, 2013). Population ageing has greatly affected Thailand along with other countries where population ageing has increased health care expenditures. It also has an impact on the decline of other budgets for national development (Office of the National Economic and Social Development Board: NESDB, 2012).

The old-age support ratios (number of workforce-age people per older person in the population) have dropped in the more developed countries and in some developing regions are anticipated to reduce in the following decades with resulting fiscal forces on support systems for the elderly (UN, 2013). The tendency of the ratio in Thailand is consistent with this trend. In 2010, there were 6 workforce-age individuals for each older person. This ratio is predicted to drop to 2 to 1 by 2030. It mirrors that the adult-age population will have to carry a considerable load for support of older persons (FTGRDI, 2012). The main reasons are that a higher proportion of women is increasingly single and employed full-time, resulting in a substantial decline in the total fertility rate (Srithamrongsawat *et al.*, 2009). This has an effect on reducing the population structures of children aged 0-14 years and the workforce aged 15-59 years (NESDB, 2012).

The elderly will clearly present the physical changes of ageing and the situation of dependency originating from the occurrences of functional disability and chronic sicknesses (Kespichayawattana and Jitapunkul, 2009). The movement towards an ageing society and continued illnesses of older people in Thailand has resulted in a higher dependency level and an increased need for their care (Sasat *et al.*, 2009b). The elderly who are in a dependency level have a demand for care from high to the highest levels. Nevertheless, older persons do not have enough caregivers or relatives who can persist in caring for them. Caregivers must have nursing skills and should be taking care of high levels of older people who require long-term care. Therefore, relatives have a very substantial burden if they look after the elderly themselves (Sasat *et al.*, 2009a). The majority of older persons in Thailand who demand long-term care receive informal care offered by their families and relatives. In Thai customs, taking care of older people is the duty of children and grandchildren and should occur in the family (Kespichayawattana and Jitapunkul, 2009). Based on these trends, the elderly who are in a dependency level have a considerable need for the use of services in institutional long-term care (Sasat *et al.*, 2009a, b).

This study focused particularly on the nursing home which is one of the biggest kinds of long-term care institution (Sasat *et al.*, 2009b). Nonetheless, some caregivers in nursing homes had constraints on their ability to satisfy the needs of older persons. For example, they were not apprenticed in institutional long-term care or they do not have the maturity to conduct themselves in a suitable manner for older people, etc. Additionally, owners of nursing homes could not provide enough personnel for the requirements of older persons because working in long-term care institution had not been a challenge or led to growth in a career like a large hospital (Sasat *et al.*, 2009a). These conditions led to declining confidence in the service quality of nursing homes that was the core problem of this study.

This problem influenced corporate image and customer satisfaction. It is harmonious with (Nguyen and Leblanc, 1998; Zins, 2001; Cheng *et al.*, 2008; Alireza *et al.*, 2011) who studied different service businesses and expressed that service quality is connected to corporate image. Brand *et al.* (1998) indicated that essential marketing constructs like service quality and satisfaction have been found particularly in the surroundings of health care. Moreover, their study

findings stated that there were strong relationships between service quality and overall satisfaction of patients for an ophthalmology group practice in the United States. In addition (Bigne *et al.*, 2003; Marley *et al.*, 2004; Cho *et al.*, 2004) stipulated that their findings supported the existence of a causal relation between service quality perceptions and patient satisfaction evaluation in the health care setting. Padma *et al.* (2010) revealed that image, infrastructure and trustworthiness were the important factors that affected patient satisfaction in a private hospital in India.

Therefore, the objectives of this study were: (1) To look at the effects of service quality and corporate image on customer satisfaction and (2) To develop structural equation modelling of these variables that affected customer satisfaction. The study subsequently focused on the customers of private nursing homes in the Bangkok metropolitan region.

LONG-TERM CARE

This is defined as taking care of the elderly by formal and informal caregivers in health, social, economic and surroundings aspects. These older persons have encountered inconvenient situations due to continued illnesses or disabilities that confine the capabilities to carry on activities of daily living (Sasat *et al.*, 2009a). Formal caregivers are persons and organizations that offer health care and supportive services to older people where customers have to pay money for service charges. Informal caregivers are relatives and friends who act in a similar manner to formal caregivers but customers do not pay for using services (Srithamrongsawat *et al.*, 2009).

NURSING HOME

This is one type of long-term care institution. The remaining kinds are assisted living, residential home, long-term care hospital and hospice care. Nursing home refers to an organization that provides long-term care for patients who do not exhibit serious symptoms but demand looking after for 24 h daily outside of their homes. Caregivers in these places have nursing skills to make certain that patients take medicine have a meal and receive assistance for some activities of daily living when they need it. Most patients are older persons who are frail and/or in pain from chronic sickness or have physiological and/or intellectual disabilities (Sasat *et al.*, 2009a, b).

SERVICE QUALITY

This is defined as the variation between customer expectations and customer perceptions (Parasuraman *et al.*, 1985). Expectations are the demands of the customers that they sense a service provider. Perceptions comprise the customer's assessment of the service provider (Lim and Tang, 2000). Parasuraman *et al.* (1988) presented a more exact meaning of service quality as the total appraisal or attitude concerning the excellence of the service.

Gronroos (1990) concentrated on two crucial parts of service quality in the health care surroundings; technical or output quality and functional or process quality. Technical quality cites the technical exactness and the medical diagnoses and process or agreement of professional conditions (Lam, 1997). Functional quality is about the characteristics in which service is offered to the customer. In the health care context, patients generally depend on the functional side (cleanliness, facilities, hospital staffs' attitudes and quality of hospital food) rather than technical perspectives when they assess service quality. Studies have noted that technical quality is not a profitable appraisal for explaining how patients assess the quality of a medical facing service (Bowers *et al.*, 1994). In addition, the majority of researches exhibited the significance of health

care's functional aspects such as nurse manner, personnel service, interaction with the patients and decoration rather than the healthcare centre's technical part of the cure (Barnes and Movatt, 1986; Crane and Lynch, 1988; Brown and Swartz, 1989). Although, technical quality is very important to patients but most patients have not the understanding to appraise the quality of the diagnostic and treatable interference procedures effectively. In reality, they cannot assess the technical quality owing to the shortage of skill (Babakus and Boller, 1991). This incompetence changes their consideration from technical quality to function (process) quality especially to the interrelationship with hospital personnel (Meyer and Collier, 1998, 2001).

The study of Oswald *et al.* (1998) showed that there was a great relationship between the patient's customer satisfaction and the service quality that were offered by the health care centre. Many authors specified the important relationship between the perception of service quality and customer satisfaction in health care settings (Cronin and Taylor, 1992; McAlexander *et al.*, 1994). Functional (process) quality is a powerful influence on customer (patient) satisfaction (Marley *et al.*, 2004). The result of a study by Brand *et al.* (1998) identified the robust relationship between service quality and overall satisfaction. Other studies have also appeared to confirm the extant causal connection between service quality perceptions and patient satisfaction assessment in the health care industry (Bigne *et al.*, 2003; Marley *et al.*, 2004; Cho *et al.*, 2004). Moreover, various researchers stipulated that service quality has a connection with customer satisfaction (Duggirala *et al.*, 2008; Cheng *et al.*, 2008; Padma *et al.*, 2009, 2010; Alireza *et al.*, 2011; Lertwarinawit and Gulid, 2011). This discussion led to the following hypothesis.

Hypothesis:

H1: Service quality directly affects customer satisfaction with private nursing homes

Gronroos (1990) incorporated the image of a service provider as the third aspect besides technical quality and functional quality in the appraisal of service quality. It behaved as a sieve in the service quality perception of the customer. However, this study regarded corporate image as another latent variable because it has an influence on other variables and is also affected by other variables. For instance, many authors (Nguyen and Leblanc, 1998; Zins, 2001; Cheng *et al.*, 2008; Alireza *et al.*, 2011) indicated that service quality has a relation with corporate image in several service businesses except the health care business. In reviewing the literature, no studies were found relating to health care that explained corporate image as a result of service quality. Hence, a second hypothesis was set as follows:

H2: Service quality directly affects the corporate image of private nursing homes

The SERVQUAL tool generated by Parasuraman *et al.* (1985, 1988) is the most broadly utilized instrument in literature about service marketing (Padma *et al.*, 2009). Service quality was grouped into five dimensions; assurance, empathy, reliability, responsiveness and tangible (Parasuraman *et al.*, 1988). There were examples of research about service quality in health care surroundings using SERVQUAL. In their study, Tucker and Adams (2001) utilized caring, responsiveness, empathy and reliability as service quality aspects of a U.S. hospital. Boshoff and Gray (2004) explained the dimensions of service quality in their study on a South African hospital as empathy of nursing personnel, responsiveness of administrative officers, physician

responsiveness, assurance, communication, security and tangibles. Ramsaran-Fowdar (2008) looked at private hospitals and stated that reliability as well as fair and equitable remedy were the crucial indicators of service quality in a Mauritius health care setting.

Nonetheless, there were involved studies that used other instruments in place of SERVQUAL. Andaleeb (1998) pointed out that competence, behaviour, facility, communication and cost were the chief factors of patient satisfaction in a hospital. Hasin *et al.* (2001) stated the perspectives of service quality in a Thai hospital as cleanliness, cost, communication, responsiveness and courtesy. Otani and Kurz (2004) revealed that physician care, nursing care, admission procedure, discharge process, compassion to friends/family and favour of circumstance to be the vital aspects of service quality in a U.S. hospital. Duggirala *et al.* (2008) found that Total Quality Service (TQS) in a health care environment is comprised of 7 indicators; (1) Process of clinical care, (2) Administrative procedure, (3) Personnel quality, (4) Overall experience in medical care, (5) Infrastructure, (6) Safety indicators and (7) Social responsibility. In addition (Padma *et al.*, 2009, 2010) specified service quality in the health care context, adjusted from the perspectives of service quality of Duggirala *et al.* (2008) as; (1) Process of clinical care, (2) Administrative procedure, (3) Personnel quality, (4) Trustworthiness of the hospital, (5) Infrastructure, (6) Safety indicators, (7) Social responsibility and (8) Corporate image.

The indicators of service quality in a hospital from Duggirala *et al.* (2008) and Padma *et al.* (2009, 2010) are adopted in this study to create aspects of service quality in a nursing home. Their studies concentrated on patients in hospitals especially in-patients when they lived in hospitals to cure particular illnesses. They were the same as with older people who resided in nursing homes for long periods of time. Additionally, hospitals and nursing homes have similar work attributes and are both in the health care group. This study altered some dimension names in service quality from the study by Duggirala *et al.* (2008) and Padma *et al.* (2009, 2010) to better fit the nature of nursing homes. The observed variables of service quality for nursing homes consisted of; (1) Process of care, (2) Service of supportive tasks, (3) Personnel quality, (4) Reliability, (5) infrastructure, (6) Safety and (7) Social responsibility.

CORPORATE IMAGE

This is the gross consequence of the interaction of knowledge, impressions, experiences, beliefs and feelings that people have about a firm (Worcester, 1997). Corporate image may be regarded as a function of the accumulation of buying/consumption experience over time (Andreassen and Lindestad, 1998). Corporate image is connected to the tangible and intangible characteristics of an organization such as architecture, diversity of products/services proposed, business name and interactions (Nguyen and Leblanc, 2001). Corporate image can be a multipart incident such as particular groups may keep several images of a single company due to their different experiences and communications with the organization (Dowling, 1988). Corporate image is not a single entity because it relies on the perception of each specific group of persons (Nguyen and Leblanc, 1998, 2001).

Image, infrastructure and trustworthiness were the key determinants of patient satisfaction for a private hospital in India (Padma *et al.*, 2010). Gronroos (1984) focused on image as the result of customer perceptions about a company. Gronroos (1984) and Kristensen (1998) identified that the image of a company that customers perceived was the preceding factor for their expectations. The idea of image involved the creation of customer expectations and perceptions (Kristensen, 1998). From this study, it is found that there is the relationship between image and customer satisfaction.

This is because customer satisfaction refers to a comparison of customer expectation to perception about the true service encounter (Hoffman and Bateson, 2006). Moreover, many studyers reported the relationship of corporate image and customer satisfaction (Zins, 2001; Hart and Rosenberger, 2004; Alireza *et al.*, 2011; Ranjbarian *et al.*, 2012). Based on these studies, the following hypothesis was set up:

H3: Corporate image directly influences customer satisfaction with private nursing homes

This study chose to measure many indicators of a nursing home's corporate image as follows: (1) Reputation (Nguyen and Leblanc, 2001, 2002), (2) Customer oriented (Nguyen and Leblanc, 2001), (3) Innovative and forward looking (Haubl, 1996) and (4) Positive opinion (Nguyen and Leblanc, 2001).

CUSTOMER SATISFACTION

Oliver (1997) described the meaning of satisfaction as a customer's expectation reaction. It is an evaluation that product and service characteristics or products and services themselves that propose a favourable level of consumption connect expectations with levels under or over expectations. Satisfaction is an emotional response to distinction between what customers expect and what they get (Zineldin, 2000). Customer satisfaction is defined as encouragement and facing with customer liking and expectation to develop for delivery of customer value (Oakland, 2000). Customer satisfaction refers to assessment of how products and services of a firm are distributed, achieve or exceed customer expectation or the degree to which products and services provided meet or exceed the customer expectation (Blanchard and Galloway, 1994). The significance of customer satisfaction cannot be refused when customers are happy with a product of organization. It seems to occur without payment of advertising (Mohsan *et al.*, 2011). Boshoff and Gray (2004) showed that satisfaction is not inbred in products or services themselves; satisfaction mainly relies on customers' perceptions of product and service natures as they involve themselves. Accordingly dissimilar customers will display several levels of satisfaction for the equal experience or service facing (Ueltschy *et al.*, 2007).

The study was conducted to evaluate the customer satisfaction with a nursing home by using a multiple-item construct as follows: (1) Overall satisfaction (Gummerus *et al.*, 2004; Otani and Kurz, 2004; Olorunniwo *et al.*, 2006; Duggirala *et al.*, 2008; Otani *et al.*, 2009; Gaur *et al.*, 2011), (2) Good experience (Gummerus *et al.*, 2004; Olorunniwo *et al.*, 2006; Akbar *et al.*, 2010; Gaur *et al.*, 2011), (3) Wise choice (Olorunniwo *et al.*, 2006), (4) Right (correct) thing (Olorunniwo *et al.*, 2006), (5) Performance versus ideal (Akbar *et al.*, 2010; Ringle *et al.*, 2011) and (6) Performance versus expectation (Ringle *et al.*, 2011).

CONCEPTUAL FRAMEWORK

Framework of this study was comprised of 3 latent variables and 17 observed variables. Service quality referred to an exogenous variable consisting of 7 observed variables: (1) Process of Care (PC), (2) Service of supportive tasks (SS), (3) Personnel Quality (PQ), (4) Reliability (RL), (5) Infrastructure (IF), (6) Safety (ST) and (7) Social Responsibility (SR). The endogenous variable that functioned as an intervening variable was corporate image consisting of 4 observed variables: (1) Reputation (RP), (2) Customer Oriented (CO), (3) Innovative and forward looking (IN) and (4) Positive Opinion (PO). Ultimately, customer satisfaction was both an endogenous and dependent variable consisting of 6 observed variables: (1) Overall Satisfaction (OS), (2) Good Experience (GE),

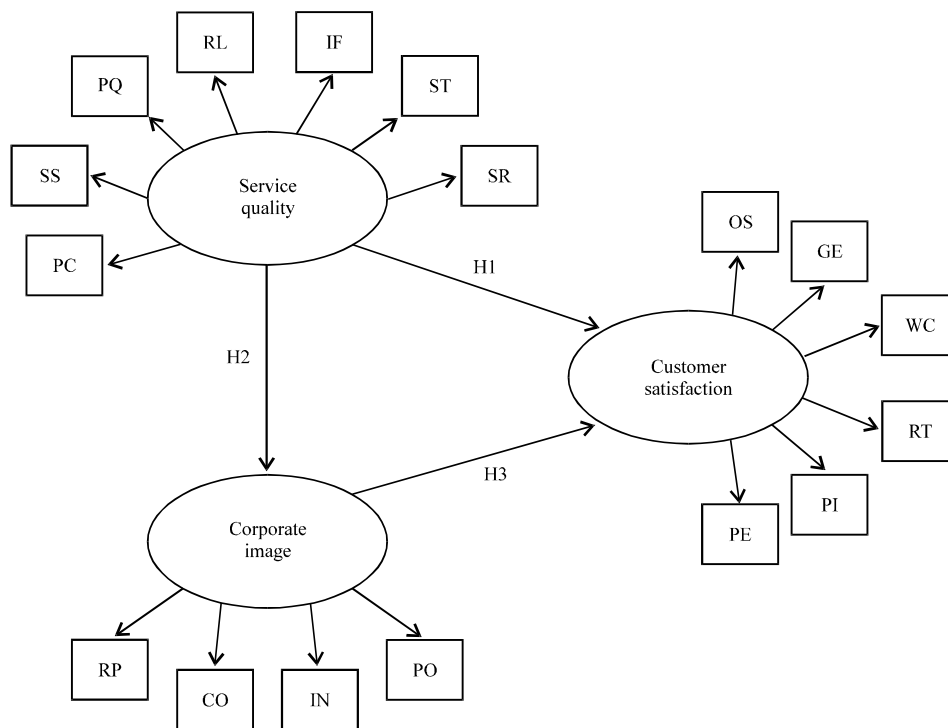


Fig. 1: Conceptual framework and related hypotheses of research

(3) Wise Choice (WC), (4) Right (correct) Thing (RT), (5) Performance versus Ideal (PI) and (6) Performance versus Expectation (PE).

Each latent variable and observed variable including paths of relation is exhibited in Fig. 1.

METHODOLOGY

This study carried out the following stages of study methods.

First, this study conducted a literature review to look at the connections among service quality, corporate image and customer satisfaction in many service businesses; for example, telecommunications, airline, hotel, etc. including the health care to search for indicators and items of these variables. Furthermore, the study queried some owners of private nursing homes and some executives of businesses that take care of older persons for related information.

Second, this study developed a questionnaire that used a seven-point Likert scale ranging from 1 (“strongly disagree”) to 7 (“strongly agree”) and collected data from samples.

Third, a quantitative study approach was conducted for the study using SPSS 20 and AMOS 20 software as follows:

- Exploratory factor analysis to obtain suitable items and observed variables in each latent variable
- Confirmatory factor analysis to inspect measurements of study and their reliability
- Development of structural equation modelling to examine the consistency of empirical data with structural models and tests of study hypotheses

The process of study brought and adapted items in the questionnaire from several studies in the review of literature:

- Items about service quality measurement were adjusted from (Duggirala *et al.*, 2008; Padma *et al.*, 2010)
- Items concerning corporate image assessment were developed from (Nguyen and Leblanc, 2001; Aydin and Ozer, 2005; Cheng *et al.*, 2008; Kaveh *et al.*, 2012)
- Items relating to customer satisfaction appraisal were improved from (Oliver, 1980, 1993; Cristobal *et al.*, 2007; Cheng *et al.*, 2008; Duggirala *et al.*, 2008; Minkiewicz *et al.*, 2011; Kaveh *et al.*, 2012)

The population and samples were composed of persons who utilized the services of private nursing homes in the Bangkok metropolitan area. The study of Sasat *et al.* (2009b) discovered that most entrepreneurs of institutional long-term care did not give data on numbers of bed and service users. Accordingly, the actual quantities were not stated in this study. The period of time in using services was at least three months (Sasat *et al.*, 2009a, b). This length of time was adequate for the customer's service perception of nursing homes. Customers were older persons (60 years and over) and their relatives (Sasat *et al.*, 2009a). Furthermore, Strasser *et al.* (1995) revealed that Indian patients' views, particularly in-patients were mainly combined with relatives or friends. This study used an accidental sampling method for gathering data because the exact numbers in the population could not be identified as noted. However, questionnaires were circulated to cover samples of study. Questionnaires were given to owners or involved staff of private nursing homes to collect data. These persons were queried every 2-4 weeks and received questionnaires every 1 month. The actual respondents were mostly relatives due to restrictions of the physiological and psychological conditions of older people.

The study especially examined in the Bangkok metropolitan region because Bangkok has a larger number of older persons than other provinces in Thailand (Department of Provincial Administration, cited in FTGRDI, 2012). This zone also has a larger number of institutional long-term care patients than other areas in Thailand (Sasat *et al.*, 2009b). In addition, Srithamrongsawat *et al.* (2009) found that there are places that offer care of the elderly with dependency levels particularly in Bangkok and also in some large cities and town regions. The study only looked at the nursing home because it is one of the largest types of long-term care institution (Sasat *et al.*, 2009b) as previously noted. Moreover, this study focused on particular private nursing homes because the government sector still does not provide long-term care services like nursing homes (Sasat *et al.*, 2009b).

This study fixed the quantity of samples in line with Schumacker and Lomax (1996) and chose the number of samples as 10 people per 1 variable. The research studied 3 latent variables and 17 observed variables for a total of 20. Therefore, the total samples to be gathered were not less than 200 samples. These quantities were enough for data processing and analysis owing to the difficulty of approach and collection of data from samples as some owners of private nursing homes did not assist in gathering of data. Additionally, more time was spent in collecting data because of constraints of older person's physical and psychological conditions and unstable visiting times of older people's relatives, for instance, their holidays, free time on week days, etc. (Satsanguan *et al.*, 2013).

RESULTS

General data of samples: This study carried out and compiled 219 samples (from older people and/or their relatives) of 20 private nursing homes in Bangkok, Nonthaburi and Pathum Thani provinces of Thailand from April to October 2013. We exhibited broad data in the samples. The majority of older persons in private nursing homes were female (64.2%), were approximately 77 years old, married and had children (63.8%) graduated in primary education (38.7%) had a career before receiving services as an entrepreneur (33%) and had a supporter of service charges from their children (61.1%) (each elderly might have more than one sponsor) and had a period in using services of around 1 year and 10 months. Furthermore, most relatives of older persons were female (69.5%) were on average 48 years old, married and had children (54.3%) completed a bachelor's degree (54.8%) had jobs as personnel of private companies (36.3%) and were their children (62.3%).

The reasons for using services in nursing homes (each respondent might reply more than one choice of reasons) were that a member in the family had to work outside the home (81.6%); were not able to provide for a caregiver of the elderly at home (53.9%) and were not trustworthy of caregivers of older people at home (33.2%). Last, the causes for change of service into the present nursing home (especially respondents who used to obtain the service from prior nursing homes) were more competence and experience of personnel in the care of older persons (59.7%), more appropriate facility and surroundings for taking care of the elderly (57.9%) and more availability of reasonable service charges (52.6%), respectively.

Exploratory factor analysis: Review of literature involved with this study related to various service businesses. This included telecommunications, airlines, hotels, health care, etc., until the items and observed variables of each latent variable (service quality, corporate image and customer satisfaction) were established. However, these service businesses had differences in business surroundings. Additionally, this study had seldom seen research about relationships of three previous latent variables in nursing homes. Previous mention led us to recheck and reorganize the observed variables of every latent variable by Exploratory Factor Analysis (EFA) using SPSS 20. Kaiser-Meyer-Olkin (KMO) values of each latent variable were equal to and higher than 0.50 (Hair *et al.*, 2003). This study found that KMO points of every latent variable more than the minimum criterion of KMO values had prior mention as presented in Table 1.

This study carried out an extraction method of principal axis factoring (one of types of common factor analysis) and rotation approach: Promax that was a proper way to study and develop the structural equation modelling. This analysis allowed for higher correlation coefficients among variables. Factor loading values of items were selected in each observed variable that surpassed 0.70 because the prior factor loading points could create a well-defined structure (observed variables of each latent variable) and were the aim of factor analysis (Hair *et al.*, 2010) as well as led to a significant total explained variance in Table 1 (Cristobal *et al.*, 2007).

Additionally, in social science study where data was frequently less exact, it was normal to think about a solution that explained 60% of the total variance as acceptable. Moreover, this study considered the reliability of measurement to evaluate the degree of harmony between multiple appraisals of a variable and made sure that replies were not too different across periods of time, though assessments conducted at any point in time were dependable. The study examined the reliability coefficient that measured the consistency of the whole scale, with Cronbach's alpha no less than 0.70 (Hair *et al.*, 2010). Overall, Cronbach's alpha points for each latent variable were more than 0.70 and as displayed in Table 1. After using Exploratory Factor Analysis (EFA),

Table 1: Exploratory factor analysis of each latent variable

Latent observed variables	Observed variables	Items	Factor loadings	
Service quality				
KMO = 0.972	Personnel Quality (PQ)	Paying attention to the elderly	0.765	
Total variance explained = 73.89%		Courtesy of personnel	0.762	
Cronbach's alpha = 0.955		Competence and experience of personnel	0.756	
		Care of personnel that is similar to relatives of the elderly	0.752	
		Understanding of the elderly' need	0.714	
		Quick responsiveness of personnel	0.702	
		Service of supportive tasks (SS)	Availability of visit to the elderly	0.937
			Convenience of service charge payment	0.701
		Reliability (RL)	Offering the services as the entrepreneurs used to promise	0.742
			Well keeping private data of the elderly	0.738
	Infrastructure (IF)	High degree of nursing home' overall reliability	0.700	
		Good air flow and sufficient light of room in which the elderly live	0.803	
		Quietness of room in which the elderly live	0.717	
		Cleanliness and hygiene of room in which the elderly live	0.705	
Corporate image				
KMO = 0.896	Customer Oriented (CO)	First concentration on customers	0.981	
Total variance explained = 86.2%		Consistency of the service with the elderly' need	0.815	
Cronbach's alpha = 0.929	Reputation (RP)	Well known nursing home	0.929	
		Fame of elderly care rather than other nursing homes	0.835	
	Positive Opinion (PO)	Positive opinion of public on nursing home	0.707	
Customer satisfaction				
KMO = 0.938	Performance versus Expectation (PE)	Service perception above the expectation of customers	0.828	
Total variance explained = 86.57%		Service perception close to the ideal of customers	0.778	
Cronbach's alpha = 0.953		Alignment of the service with the expectation of customers	0.710	
	Good Experience (GE)	Good experience of service using	0.811	
	Right (Correct) Thing (RT)	Right (correct) thing for service using of nursing home	0.758	

observed variable quantities in every latent variable was reduced (Table 1) as compared with observed variables (Fig. 1). Because the stern criterion of factor extraction was used, items of each observed variable that was smaller than 0.70 were deleted.

Confirmatory factor analysis: Confirmatory Factor Analysis (CFA) or measurement models are used to discover a suitable measurement that was significant and statistically satisfactory. Items of each observed variable were joined (particularly observed variables that had more than one item) and computed an overall mean to build a new construct of observed variables for use in this analysis (Table 2). The values of goodness-of-fit assessment were provided to inspect model fit or consistency of the empirical data that were collected with the model that was established from the literature review. These values of goodness-of-fit measurement were the p-value of chi-square (χ^2), Goodness-of-Fit Index (GFI), the Root Mean Square Error of Approximation (RMSEA) and Comparative Fit Index (CFI) due to their constancy, robustness and shortage of responsiveness to sample size (Hair *et al.*, 2006). Carmines and Mciver (1981) also focused on CMIN/degree of freedom (χ^2/df). Standard of the values of goodness-of-fit evaluation are shown in Table 3.

Table 2: Descriptive statistics and correlation matrix between observed variables (OV)

OV	Mean	S.D.	PQ	SS	RL	IF	CO	RP	PO	PE	GE	RT
PQ	5.642	0.888	1.000									
SS	5.948	0.899	0.698	1.000								
RL	5.691	0.925	0.753	0.693	1.000							
IF	5.408	0.962	0.611	0.566	0.698	1.000						
CO	5.589	0.977	0.735	0.716	0.762	0.625	1.000					
RP	5.139	1.049	0.595	0.463	0.603	0.505	0.696	1.000				
PO	5.644	1.023	0.718	0.640	0.694	0.582	0.817	0.713	1.000			
PE	5.443	1.040	0.776	0.617	0.716	0.611	0.749	0.728	0.774	1.000		
GE	5.603	0.987	0.709	0.638	0.618	0.548	0.715	0.605	0.745	0.777	1.000	
RT	5.658	1.021	0.756	0.745	0.765	0.641	0.778	0.614	0.708	0.855	0.743	1.000

SD: Standard deviation

Table 3: Criteria of the values of goodness-of-fit appraisal

Statistical values	Criterion instruction	Authors/year
p-value of chi-square	p>0.05	Joreskog and Sorbom (1992)
CMIN/df (χ^2/df) or normed chi-square	<2	Carmines and Mciver (1981)
GFI	>0.90	Hair <i>et al.</i> (2010), Tanaka and Huba (1989)
RMSEA	<0.05	Schreiber (2008)
CFI	>0.95	Schreiber (2008)

This study had a plain model and few samples, so the criteria of the values of goodness-of-fit assessment were stricter than for a complicated model with big sample (Hair *et al.*, 2010). When the values of goodness-of-fit evaluation were considered for the measurement model, these values were found to be unfit for this model. In considering the assessment model fit, Modification Indices (MI) and great standardized residual covariance were profitable signs of an unfit model (Cheng, 2001). Additionally, when the model was not a good fit, indicators could be connected or increased to various determinants or erased from model which was still accordant with statistical, theoretical and applicable deliberation (Anderson and Gerbing, 1988).

For using CFA in this study, the measurement model was adjusted by deletion of four observed variables that were derived from EFA, Right (correct) Thing (RT), reputation (RP), reliability (RL) and Service of Supportive tasks (SS). The study considered pairs of observed variables' correlation coefficients (Table 2) where values were over 0.85 and MI. Griffiths *et al.* (1993) stipulated that perhaps multicollinearity will be a difficulty when a correlation coefficient was larger than 0.80 or 0.90. Pairs of observed variables' correlation coefficients were Performance vs. Expectation (PE) and Right (correct) Thing (RT) were higher than 0.85 (the average of 0.80 and 0.90). Because Studenmund (2006) addressed that when the absolute value of a simple correlation was bigger than 0.80, it got involved with multicollinearity.

According to the authors opinion in this study, the correlation coefficient of variables surpassed 0.85 was very high and was nearly perfect correlated. The study chose to eradicate RT because RT had only one item that represented this observed variable while PE had three items to indicate it. In addition, the factor loading value of RT was lower than of PE. This study Removed Reputation (RP) because the data of MI identified that RP had a relation with many observed variables and the factor loading value of RP was less than the rest of observed variables for latent variable (corporate image).

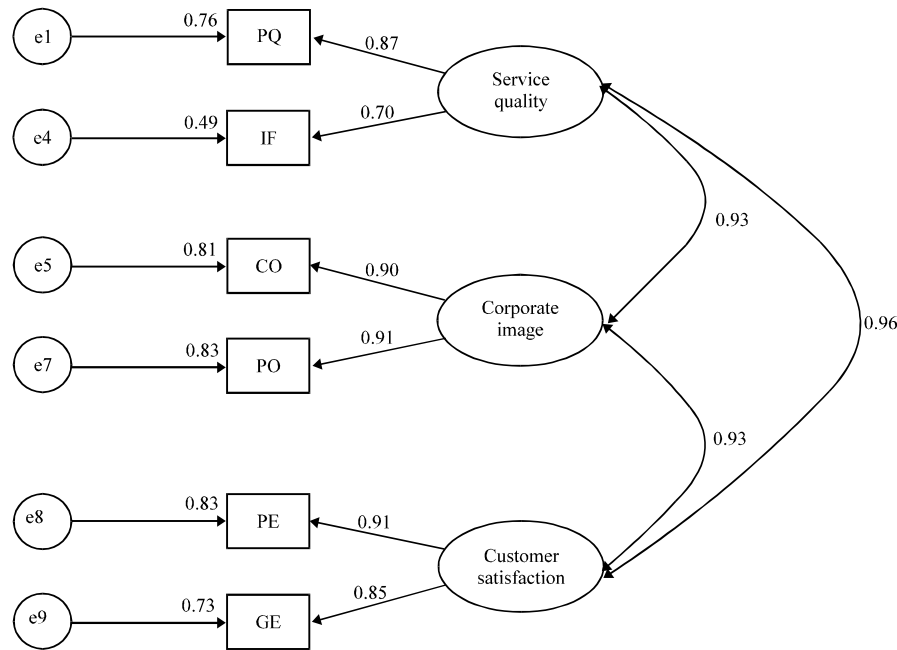


Fig. 2: Confirmatory factor analysis of service quality, corporate image and customer satisfaction of private nursing homes

Finally, the study erased Service of Supportive tasks (SS) and reliability (RL) because the data of MI specified that the error term of both observed variables related to observed variables of other latent variables; corporate image and customer satisfaction. Nevertheless, the study could not delete the remainder of observed variables for both latent variables because each prior latent variable had two observed variables. Consequently, the finding of CFA (Fig. 2) exposed fair and sensible fit between the assessment scales and data of all samples; CMIN (chi-square) = 8.663, df = 6, CMIN/df = 1.444, GFI = 0.987, RMSEA = 0.045 and CFI = 0.997 which were harmonious with the criteria of the values of goodness-of-fit measurement in Table 3.

Structural equation modelling: After using CFA, the authors of this study proceeded to examine the structural model with AMOS 20 (Fig. 3). The values of goodness-of-fit evaluation were similar to the measurement model and were consistent with the standards of the value of goodness-of-fit appraisal in Table 3. Moreover, the use of Structural Equation Modelling (SEM) could test the hypotheses of this study that were mentioned in the review of literature because this method offered statistical ability and the efficiency to measure the relationships thoroughly, given the change from EFA to CFA (Hair *et al.*, 2006).

From the findings of the structural equation modelling, Table 4 and 5 revealed that first service quality had a direct impact on customer satisfaction of private nursing homes in the Bangkok metropolitan region. This was accordant with hypothesis 1. The regression weight between service quality and customer satisfaction was 0.686 ($p < 0.05$) and the Critical Ratio (C.R.) was 2.565 (higher than 1.96). The model could interpret 93.7% of customer satisfaction variability (R^2). Although, regression values of corporate image and customer satisfaction was almost low (0.297), service quality and corporate image worked together to explain the variance of customer satisfaction.

Table 4: Standardized regression weights for structural model

Variables		Estimate	S.E.	C.R.	p-value
Corporate image	← Service quality	0.928	0.080	13.092	***
Customer satisfaction	← Service quality	0.686	0.291	2.565	0.010
Customer satisfaction	← Corporate image	0.297	0.242	1.174	0.240
PQ	← Service quality	0.873	0.097	11.844	***
IF	← Service quality	0.700	0.073	11.844	***
CO	← Corporate image	0.899	0.048	19.861	***
PO	← Corporate image	0.908	0.053	19.861	***
PE	← Customer satisfaction	0.911	0.063	17.951	***
GE	← Customer satisfaction	0.853	0.050	17.951	***

***p<0.001

Table 5: Square multiple correlations (R²)

Variables	Estimate
Corporate image	0.860
Customer satisfaction	0.937
PE	0.829
GE	0.728
CO	0.808
PO	0.825
PQ	0.762
IF	0.490

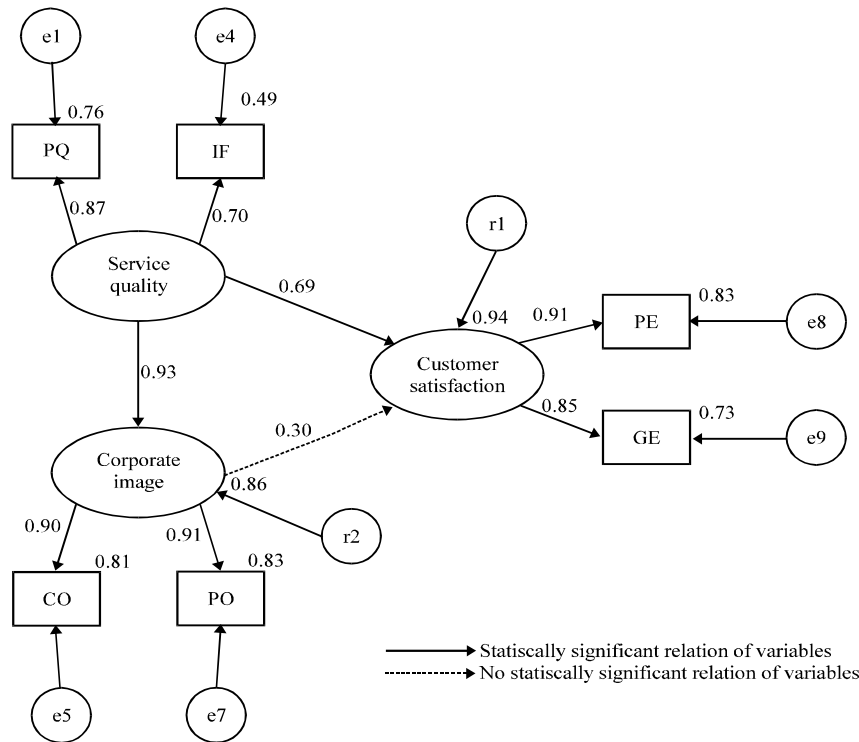


Fig. 3: Results of the structural equation modelling of service quality, corporate image and customer satisfaction of private nursing homes

Second, service quality had a direct effect on corporate image of private nursing homes in the Bangkok metropolitan area which was harmonious with hypothesis 2. The regression loading between both of them was 0.928 ($p < 0.001$) and C.R. was 13.092 (greater than 1.96). Eighty six percent of the variation in corporate image (R^2) could be explained by service quality.

Last, corporate image did not directly impact on customer satisfaction of private nursing homes in the Bangkok metropolitan zone which was inconsistent with Hypothesis 3. This was because the path coefficient between corporate image and customer satisfaction was below (0.297) ($p > 0.05$) and C.R. was 1.174 (less than 1.96). These values showed that both early latent variables did not connect with statistical significance. Furthermore, Personnel Quality (PQ) and infrastructure (IF) were important indicators of service quality (C.R. > 1.96 and $p < 0.001$), Customer Oriented (CO) and Positive Opinion (PO) were essential indicators of corporate image (C.R. > 1.96 and $p < 0.001$) and Performance vs. Expectation (PE) and Good Experience (GE) were major indicators of customer satisfaction (C.R. > 1.96 and $p < 0.001$).

DISCUSSION

From the results of data analysis, service quality directly affected customer satisfaction of private nursing homes in the Bangkok metropolitan region which was accordant with hypothesis 1. The 7 dimensions of patient-perceived TQS in healthcare (infrastructure, personnel quality, safety indicators, overall experience of medical care received, process of clinical care, administrative procedure and social responsibility) expressed by Duggirala *et al.* (2008) were definitely important determinants of satisfaction with the health care received by the patients. Padma *et al.* (2010) stated that there was a relationship between service quality and customer satisfaction in health care service of India. When they considered each dimension of service quality, they found that personnel quality had the greatest correlation with and was a vital predictor of customer satisfaction because patients and attendants (customers of the hospital) could not appraise the technical quality of healthcare services. Infrastructure and personnel quality of private hospitals had a significant effect on attendant satisfaction while trustworthiness, image and infrastructure were crucial predictors of patient satisfaction in private hospital. Government hospitals in India are seen to offer physicians who have proper knowledge and experience for cure and private hospitals are known for their infrastructure. Lertwarinawit and Gulid (2011) identified that service quality of private hospitals' medical services in the Bangkok metropolitan region had a positive connection with the satisfaction of foreign tourists who utilized medical tourism services. Satsanguan *et al.* (2014b) indicated that the care of personnel that are similar to relatives of the elderly and the quietness of rooms in which the elderly live had an effect on customer satisfaction of private nursing homes in the Bangkok metropolitan area. It was also noted that the findings of these prior studies were alike with the results of this study. In this study, the observed variables of service quality (personnel quality and infrastructure) were consistent with indicators of service quality in these previous studies. Additionally, the findings were harmonious with the literature review that revealed functional (process) quality such as facilities, decoration, cleanliness, interaction with patients, service of personnel, etc., affected customer satisfaction rather than technical (output) quality.

Service quality directly influenced corporate images of private nursing homes in the Bangkok metropolitan zone which was accordant with hypothesis 2. In the literature review, the authors of this study did not see researches about the health care business that exhibited the relationship between service quality and corporate image. However, there were studies concerning other service

businesses that stipulated the relationship of both variables. Zins (2001) stated that service quality had a connection with the image of various European airlines. Cheng *et al.* (2008) revealed that service quality had an impact on the image of internet service providers in Hong Kong. Alireza *et al.* (2011) exposed that service quality directly affected image perception, perceived value and customer satisfaction of the telecommunication industry in Iran.

Corporate image did not directly impact customer satisfaction of private nursing homes in the Bangkok metropolitan area which is not harmonious with hypothesis 3 and Padma *et al.* (2010) addressed that image, trustworthiness and infrastructure were the vital determinants of patient satisfaction in the private hospitals of India. Possible reasons for this difference were that the majority of private nursing homes where the researcher of this study gathered data had a small size, resulting in insufficient expenditures for decorating the place, building a pleasant atmosphere and providing up-to-date equipment to satisfy customer needs. This led to a decline in customer satisfaction. In addition, some persons in society had negative opinions about nursing homes. This was because they were the last residence of older persons and some older people passed away there (Satsanguan *et al.*, 2014a). So, these people felt very unhappy about the image of nursing homes. If service users of nursing homes had the same belief as these prior persons, they were scarcely be pleased with nursing homes.

CONCLUSION

This study explored and developed the structural equation modelling of service quality and corporate image that affected customer satisfaction of private nursing homes in the Bangkok metropolitan region. The heart of the study problem was the lack of customers' confidence in the service quality of private nursing homes which had an impact on corporate image and customer satisfaction. From the results of this study, service quality is the crucial factor because it has a direct effect on both the customer satisfaction and the image of private nursing homes. Key dimensions of service quality were personnel quality and infrastructure. Owners and persons connected with management of private nursing homes have to prioritize personnel development especially for caregivers of the elderly because they are the closest to older persons in nursing homes. The points for improvement are; (1) Alertness to older people, (2) Politeness, (3) Ability and skill of elderly care, (4) Comprehension of older persons' demand, (5) Fast responsiveness and (6) Care like relatives of older people.

Satsanguan *et al.* (2014b) identified that establishing a good attitude toward the care of older people and giving personnel the courage to pursue the opinion that the elderly are like their relatives are important. Moreover, entrepreneurs and personnel in management levels in private nursing homes must improve rooms that older persons inhabit to be silent with good air flow, adequate light, cleanliness and hygiene. Older people have frailties, deterioration of health and chronic sicknesses so these conditions of rooms in private nursing homes are important factors for elderly quality of life. Restriction of older persons for physiological and psychological conditions and inconstant timing of relatives' visits caused taking more time for data collection and shortages of personnel support in some private nursing homes in gathering data led to some limitations in this study. Further studies should take samples from larger size private nursing homes because this study collected data from particularly small nursing homes. Various sizes of businesses may differently or similarly influence the relationships of each variable. Furthermore, future studies might adjust the indicators of every latent variable to better match the context of nursing homes.

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