

*Full Length Research Paper*

# **A study on investigating patient satisfaction of medical centers using Taiwan customer satisfaction index in Taiwan**

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**The study on national customer satisfaction index model has continued to develop prosperously. Almost every developed country (including Taiwan) is planning to study or is setting up their own customer satisfaction index measurement and model. This paper aims to evaluate patient satisfaction of medical centers using the Taiwan Customer Satisfaction Index (TCSI). A survey of 1,200 patients from four medical centers in Taiwan was performed and the valid questionnaires totaled 1,046. The data was analyzed by Structural Equation Modeling (SEM) and the result showed that the biggest factor that impacts customer loyalty is customer satisfaction. Perceived quality and value have a positive effect on customer satisfaction. The conclusion provides valuable comment for medical centers, to develop strategies to increase their competitiveness in Taiwan.**

**Key words:** Patient satisfaction, Taiwan customer satisfaction index, medical center.

## **INTRODUCTION**

The first hierarchy of the Maslow need-hierarchy theory mainly deals with physical needs, medical care plays one of the important roles and acts as one part of basic human needs in acquiring physical health and forms one important index to measure national progress. In developed countries, the soaring of medical and biological science and technology, the income increase, and aging population have contributed to a great increase of medical service expenses. Therefore, effective distribution and utilization of all of the resources of the medical industry have become important political motions of all the countries. Consequently, no matter how environmental factors change, the hospital managers adhere to improving medical service quality, proving satisfactory

medical service, ensuring customer's willingness to accept medical service and maintaining friendly hospital-patient relations for the perpetual operation of the hospital. Because Taiwan has implemented a compulsory health insurance policy, the competition mainly focused on satisfactory medical service quality instead of low price, so that to win the patient's trust and build up their willingness to receive medical service, as well as set up the foundation of perpetual operation. Therefore, it is very important to learn the cause and effect of customer satisfaction for the improvement of the medical service quality in Taiwan.

Taiwan implemented national health insurance (NHI) in 1995. Since then, fierce competition has been initiated in the medical service industry; the Administration of Health Insurance established a payment system to provide various services, which restricted medical service providers to compete in an insurance system with a fixed payment scheme. The number of wards increased to

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152,901 in 2008 from 103,733 in 1994, which was an increase of 47.40%, while the number of hospitals reduced to 515 from 828 (Department of Health, Taiwan, 2009). The information based on which hospital patients, and his/her relatives, chose was mainly the hospital image and its ward number (Cheng et al., 2003). The said trend showed that small hospitals had been repelled by the market. In an environment where consumers increased, obviously, by years and had free choices, price was not the main deciding factor. The increasingly fierce competition drove the hospitals to be more sensitive to their concepts of service, so how to uplift the hospital image, increase customer satisfaction, provide consumers with satisfactory quality of medical service and maintain long-term favorable hospital-patients became points of focus. The measurement of customer satisfaction being used as an index of the result became an emphasis. The hospital management method is to educate its personnel to satisfy patients' desires and to meet their requirements, by which it can improve its competitiveness (Tang and Cheng, 2001).

Customer satisfaction is a key issue of customer satisfaction management and one of the indexes for medical service appraisal. ACSI Institute would regularly use the American Customer Satisfaction Index (ACSI) to evaluate patient satisfaction with hospitals in the United States (American Customer Satisfaction Index, 2010). However, Customer satisfaction survey could be changed with the different national conditions, culture and habits of the people, ACSI is not one for all the countries in the world. Scholars from different countries according to their own national situations and culture to build their own customer satisfaction index. For example, European Customer Satisfaction Index (ECSI), Korean Customer Satisfaction Index (KCSI), Chinese Customer Satisfaction Index (CCSI), etc. In Taiwan, Lee (2005) also refers to ACSI and ECSI, and considering the characteristics of Taiwanese to develop Taiwan Customer Satisfaction Index (TCSI). Medical Center is an important type of health care industry in Taiwan. Therefore, this paper aims to investigate customer satisfaction of medical centers in Taiwan by using TCSI.

## LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

### *Customer satisfaction*

The primary task of a corporation is to create customer satisfaction. Profit is not the most important result; after all, it is only the feedback after satisfying the customer (Drucker, 1954). Customer satisfaction is regarded as customers can get more benefits than their cost (Liu and Yen, 2010). Cardozo (1965) was the first scholar to put forward the concept of customer satisfaction, believing

that customer satisfaction may increase a customer's repeated purchase behavior and purchase for other products. Since then, many scholars have put forward theories relating to customer satisfaction. The concept of customer satisfaction has dominated marketing and practice for almost one century. In the 1970s, customer satisfaction occurred in formal research and investigation fields (Churchill and Surprenant, 1982).

Woodside et al. (1989) believed that customer satisfaction was the main factor influencing consumer behavior. Fornell (1992) believed that satisfaction was a kind of integral feeling which could be directly assessed, and satisfied customers were assets of the company, which could conduct repeated purchases, thus "customer satisfaction" was the index of economic welfare. Anderson et al. (1994) indicated that satisfaction was the total experience on purchase and consumption of a product or service and the overall appraisal accumulated as time went by. Czepiel et al. (1974) pointed out that satisfaction was an accumulated concept which summarized the satisfaction towards specific products or services from the institution or satisfaction towards different aspects of the institution; they believed that customer satisfaction was an integral reflection of assessment, which represented the summation of subjective attitudes towards different attributes of each product, that is, the integral satisfaction was the objective of customer satisfaction measurement.

Ostrom and Iacobucci (1995) believed that customer satisfaction could measure the difference between customer's expectations and perceived value of a product or service, that is product price, service efficiency, service attendant's attitude, the overall performance of the company and the expected intimacy regarding the company. Jones and Sasser (1995) considered the customer's desire for repurchase, basic behavior (the latest purchase time, quantity and amount) and derivative behaviors (public recommendation, praise and customer introduction) as the factors to measure customer satisfaction. Bostan et al. (2007) pointed out that the quality expectation regarding rural hospitals was usually lower than that of urban hospitals in studies on expectation regarding hospitals, but driven by medical knowledge and patient rights, patients are requiring more from the medical service quality in hospitals. Bostan et al. (2007) advised to first understand customer needs then meet those needs, so that to effectively achieve the return rate of patients. In fact, customer satisfaction is not a new proposal. Many hospitals have been fully aware of its importance, but they don't have an effective evaluation index.

The theories for customer satisfaction research include assimilation theory, comparison theory, imbalance theory, expectancy disconfirmation theory, equity theory, attribution theory, etc. In studies on consumer purchase behavior, many scholars widely used expectancy-confirmation theory and rational expectancy theory to

discuss consumer consumptive attitude of pre-purchase expectation and after-purchase satisfaction (Kolter, 2006). Countries shall adjust their selected National Customer Satisfaction Index indexes (NCSI) according to their own national situations. For indexes relating to customer satisfaction, TCSI is basically similar to American Customer Satisfaction Index (ACSI) and European Customer Satisfaction Index (ECSI). The measuring indexes for TCSI are three indexes comparing overall satisfaction, expectation realization degree and ideal state.

### ***National Customer Satisfaction Index model***

Woodside et al. (1989) emphasized that customer satisfaction was the main factor influencing consumer behavior, satisfied customers were assets of a company, since they not only conducted repeated consumption, but also the best marketing partners of the company (Fornell, 1992). Kolter (1997) pointed out that a dissatisfied customer would complain about his/her upset experience to 11-13 people in one of his studies; While a satisfied customer would only tell three people about his/her agreeable experience. Therefore, maintaining an existing customer is more important than abstracting a new customer. In 1992, Fornell's Swedish Customer Satisfaction Barometer (SCSB) was the first trans-industrial assessment to customer satisfaction. In 1994, Fornell set out to develop the ACSI. Encouraged by the successful development of SCSB and ACSI, almost all the developed countries are researching or have established the measuring method and model of a national customer satisfaction index, such as the Swiss Customer Satisfaction Index (SWICS) in 1998, the ECSI in 2000 and later the KCSI, CCSI, TCSI, etc.

### ***Taiwan Customer Satisfaction Index model***

The NCSI is widely used by various brands, traders, industries, and business fields to analyze customer satisfaction regarding their services. NCSI is different from a traditional customer satisfaction index, since NCSI provides the same weight to individual variables and discusses the inter-relation between variables (Fornell, 1992). Traditional customer satisfaction analyzes estimated parameters for all variables respectively and discusses the gap of each variable. It may be suspected that the model is not fully defined. Relatively, NCSI includes the hidden relation between variable evaluation parameters and variables in structural equations. Therefore, NCSI can clearly define the relations between variables and provide a general forecast to future development. The scholar also found that the characteristics of NCSI (Karatepe, 2005), single customer satisfaction index, usually develop their quality measurement on the basis of the development of a single culture or a national

culture, so special care should be taken to extend a customer satisfaction measurement to another nation or country. Therefore, scholars believed that to measure or evaluate customer satisfactory quality for an area, a customer satisfaction index should be developed suited to its special quality measurement. Driven by the joint R&D of the National Quality Research Center of Chung Hua University and Chinese Society for Quality, TCSI is developed on the basis of ACSI and ECSI (Lee, 2005).

The TCSI model mainly provides reference for the objective quality index in Taiwan and improves the national, industrial and enterprise competitiveness. The customer expectancy index and perceived quality followed the principle of the ACSI (National Quality Research Center, 2005). In addition, the perceived value, customer satisfaction and customer loyalty indexes corresponded to ECSI (Kristensen et al., 2000). In addition, TCSI integrated Grönroos's (1993) research suggestion on considering the feeling regarding service perception, including the process (function and quality), effect (scientific and technological quality) and service provider's image.

### **Hypothesis development**

Considering there are many studies concerning service quality and customer satisfaction, while most of the previous medical service studies mainly focus on service quality and few deal with the relevancy of customer satisfaction and customer loyalty (Shemwell et al., 1998). Therefore, this paper empirically studies the hospital patients and investigates the relation of customer's image expectation, hospital expectation, perceived medical service quality, perceived medical service value and customer satisfaction, then explores the influence regarding customer loyalty. Based on theoretical basis of the TCSI model (Lee et al., 2005; 2006), this paper establishes  $H_1$  to  $H_{10}$ .

- $H_1$ : Image positively influences customer expectation.
- $H_2$ : Image positively influences customer satisfaction.
- $H_3$ : Image positively influences customer loyalty.
- $H_4$ : Customer expectation positively influences perceived quality.
- $H_5$ : Customer expectation positively influences customer satisfaction.
- $H_6$ : Customer expectation positively influences perceived value.
- $H_7$ : Perceived quality positively influences customer satisfaction.
- $H_8$ : Perceived quality positively influences perceived value.
- $H_9$ : Perceived value positively influences customer satisfaction.
- $H_{10}$ : Customer satisfaction positively influences customer loyalty.

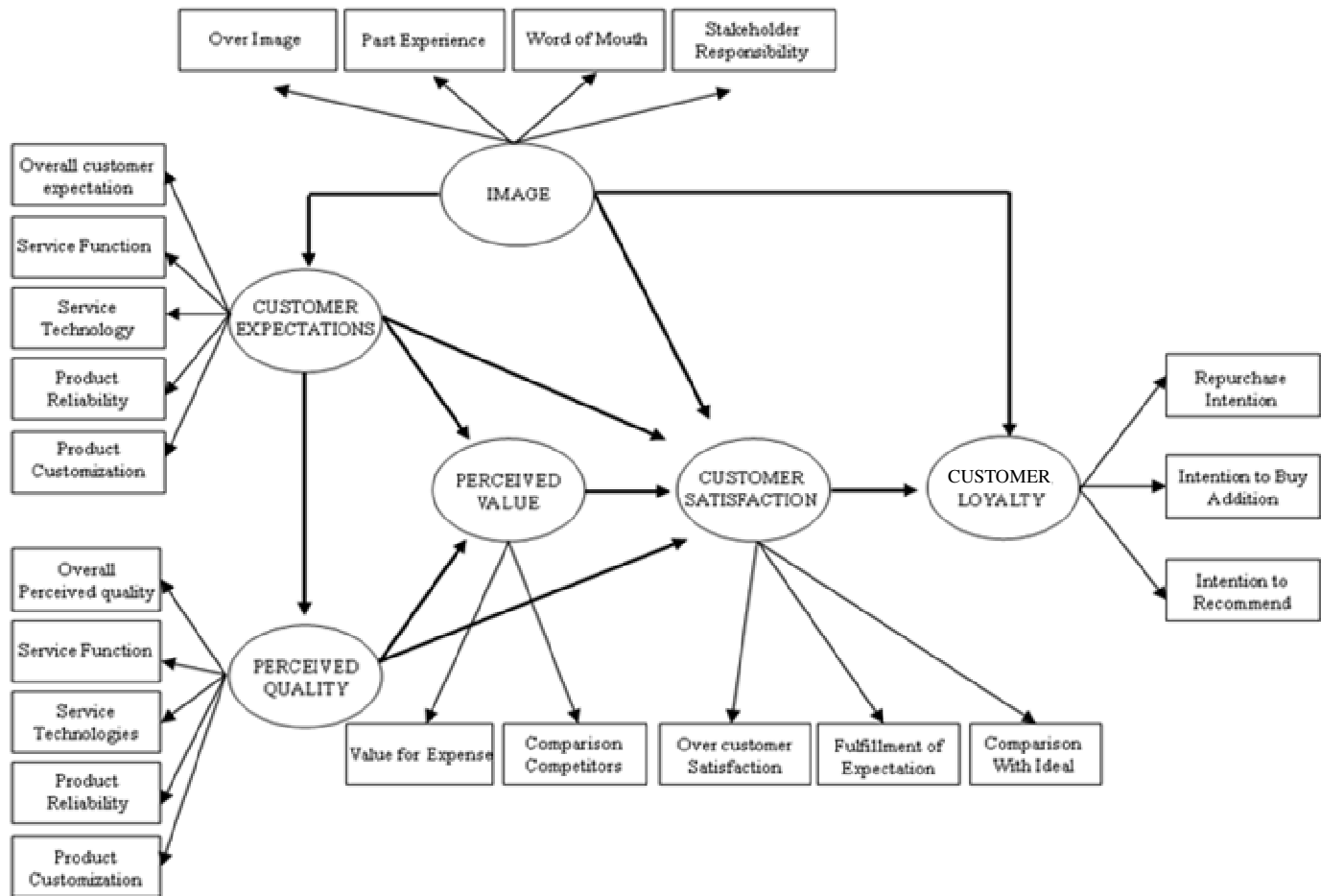


Figure 1. The TCSI model of medical care.

## METHODOLOGY

### Structure of the TCSI model by medical service

Many empirical researches have shown that customer satisfaction could ensure future income (Fornell, 1992), reduce future business expense and price elasticity and minimize the possibility of customer defection. Customer satisfaction plays a very important role for overall quality management. Service quality is an abstract and difficult concept to understand, whose specific definition and measurement are difficult to master (Brady and Cronin, 2001; Brown and Swartz, 1989). It is generally believed that service quality means a consumer's subjective perception regarding products and services from providers, or the consumer's overall appraisal after comparison between expected and actual performances of products and services. In addition to the common characteristics of an ordinary service industry, the medical service industry also has the following special characteristics: public welfare characteristic of medical service, probability of medical consumption, unsymmetrical information of medical service and difference of medical service, which jointly contribute to its monopolization. According to Parasuraman et al. (1988), the definition of medical service quality may change with the development of medical technology and knowledge, people's increasing awareness to patient rights and improvement of expected medical care standard, thus excellent medical service quality should not only enable each

patient get the most appropriate medical process and result and avoid any complications, but also should effectively care for the patient's and his/her relative's medical needs and mental feelings (Bostan et al., 2007).

The prosperous development of the medical service market drove scholars and medical institution managers to pay increasingly more attention on how to improve medical service quality and customer satisfaction, while they emphasized more on maintaining agreeable hospital-patient relations. In an age with increasing patient rights and fierce competition in the medical service market, top quality medical service is not only an important factor influencing its market positioning strategy, but also the best differentiation strategy. Therefore, no medical institution does not emphasize favorable communication and interactive relations with customers, and does not expect to improve medical service quality and to increase customer satisfaction, by which to increase customer loyalty to the medical institution.

Most of the recent researches focus on the relevancy of emotional consumption experience and the overall satisfaction and believe that the consumer's emotional use experience will form the overall expectation regarding products or services, which will turn into overall satisfaction (Oliver, 1993). Thus, consumer emotional satisfaction level of using products or services is the key factor of overall satisfaction (Chen et al., 2005). The study summarizes the basic model of the TCSI model for medical service after analyzing relevant literatures, the model is a deduction model including six

structural variables, namely image ( $\xi$ ), customer expectations ( $\eta_1$ ), perceived quality ( $\eta_2$ ), perceived value ( $\eta_3$ ), customer satisfaction ( $\eta_4$ ) and customer loyalty ( $\eta_5$ ), in addition to 18 observation variables (as Figure 1).

In Figure 1, the thick arrow lines represent the deduction of the variables in the model, whose direction is from the motivation variable to deduction variable, the parameters beside the lines are all valid. The momentums driving customer satisfaction in the model include image, customer expectation, perceived quality and perceived values. The deduction variable driven by customer satisfaction is customer loyalty, and relevant research on TCSI showed that the relation between structural variable and observation variable in the model could be measured by a linear system.

## Measures

The paper based on Lee et al.'s (2005; 2006) study to design the questionnaire of the TCSI in medical care. The questionnaire consists of three parts of personal patient information, customer satisfaction investigation and personal information, among which all the items of customer satisfaction are measured by a Likert Ten-grade scale, e.g. one stands for poor impression and 10 stands for excellent impression. The study divides TCSI into six types, including image, expectation, perceived quality, perceived value, customer satisfaction and customer loyalty. Here, the above variables are defined as follows:

Part I (Hospital information): Mainly investigates the interviewee's experience in the material collection period.

Part II (Customer satisfaction investigation): Mainly measures the six potential factors, including the hospital "image", "expectation", "perceived quality", "perceived value", "customer satisfaction" and "customer loyalty", and indirectly investigates the interviewee's overall appraisal to the hospital products and services on the basis of these potential variables.

1. Image: Studies the interviewee's "integral impression", "past experience", "reputation" and "responsibilities for interested party" of the hospital before he/she went there.

2. Expectation: Studies the interviewee's "overall expectation", "expectation to service attendant", and "expectation regarding hardware" before he/she went to the hospital.

Perceived quality: The actual "overall appraisal", "feeling regarding service" and the "feeling regarding hardware" in the hospital.

3. Perceived value: The "cost-time value" and "comparison with other medical service value" of the hospital.

Customer satisfaction: The "overall satisfaction", "degree of coincidence with the expectation" and "degree of similarity to the ideal hospital" of the hospital.

4. Customer loyalty: Investigates future hospital selection intention, including "possibility of return", "possibility of going to a competitor hospital" and "possibility of recommendation to others."

Part III (Personal information): Uses item measurement to investigate consumer's basic statistical information, including "sex", "age", "family information", "education background", "career", "monthly income" and "home address."

## Data collection and statistical analysis

Before formal investigation, data was collected by convenient sampling. The sampling was done in Yeezen Hospital for the sake of convenience. The reliability was conducted by pre-tested data for correcting questionnaire content. A total of 300 questionnaires were issued and 260 valid questionnaires were returned. The return rate reached 87%. From the collected questionnaire, we can learn whether the measurement has any errors and learn whether the interviewee misunderstood or was puzzled in answering process. After analyzing the reliability of the pre-test questionnaire, the

Cronbach's  $\alpha$  value of the results were all above 0.7, which meant that the interviewees could understand and clearly answer the questions in the questionnaire. The formal investigation sampled from March 1 to July 31, 2010 in four medical centers (National Taiwan University Yun-Lin Branch, Taipei Veteran General, Taichung Veterans General Hospital and China Medical University Hospital) and collected data from patients in four hospitals. A total of 1,200 questionnaires have been issued, except invalid questionnaires with incomplete answers or random answers, the valid questionnaires totaled 1,046, and the return rate reached 87.17%. The Cronbach's  $\alpha$  value of each construct was higher than 0.7, which showed that the research questionnaire was of sufficient reliability.

In this paper, we reviewed the fitness of the internal structure of the model, as well as its validity, through confirmatory factor analysis (CFA) using maximum likelihood to estimate parameters. Finally, we also tested and verified the path analysis of TCSI model through structural equation modeling (SEM).

## RESULTS

### Profile of the respondents

The background variables collected and analyzed by the research institute include sex, age, family information, home address, career, personal income and education background. The relevant background variables after description and statistical analysis are shown in Table 1.

### Internal reliability and validity analyses

Before conducting structural equation modeling, this study measured the goodness of fit of the proposed model through confirmatory factor analysis (CFA). The measurement model of this study provided a good overall fit with the data (GFI, AGFI CFI, NFI and NNFI  $\geq 0.9$ ,  $\chi^2/d.f. < 3$ , RMR and RMSEA  $\leq 0.06$ ). This model remained within the acceptable scope. Since these parameter values are within accepted standards, the research model met the basic requirement for goodness of fit. With respect to validity analysis, factor loading between each construct and the observed variables (that is, items) was found to be greater than 0.5 ( $p < 0.001$ ), indicating that the research model presented demonstrates significant convergent validity (Fornell and Larcker, 1981). In addition, discriminant validity is established if the average variance extracted (AVE) for all constructs (that is, average of the squared loading) is larger than the squared multiple correlation (SMC) (Fornell and Larcker, 1981). Table 2 shows the total variance of all the constructs to be larger than the squared correlations between constructs, indicating sufficient discriminant validity.

### Path analysis of research model (TCSI)

Since the total number of sampled people was 1,046,

**Table 1.** Profile of the respondents.

Background variable	Characteristics	Frequency	%
Sex	Male	765	41.7
	Female	949	51.7
Age (Years)	Below 20	170	9.3
	21-30	464	25.3
	31-40	438	23.9
	41-50	362	19.7
	51-60	252	13.7
	Above 60	144	7.8
Family information	Unmarried	555	30.2
	Married, no child	234	12.7
	Married, one child	410	22.3
	Married, two children	380	20.7
	Married, more than two children	233	12.7
Home Address	North Chiayi	689	37.5
	Tao-Chu-Miao	356	19.4
	CCT	323	17.6
	Yun-Chia-Nan	252	13.7
	Kao-Ping	179	9.7
	Hwa-Tung	11	0.6
	Other	4	0.2
Career	Unemployed	197	10.7
	Student	211	11.5
	Army, government, education	304	16.6
	Industry	244	13.3
	Commerce	196	10.7
	Free lance	238	13
	Service	330	18
	Other	85	4.6
Monthly income (Thousand)	No income	348	19
	Below 20	203	11.1
	20-40	782	42.6
	40-80	377	20.5
	80-100	57	3.1
	Above 100	34	1.9
Education background	Primary school or below	144	7.8
	Secondary school	181	9.9
	Senior school	418	22.8
	College	511	27.8
	University	433	23.6
	Research institute or above	124	6.8

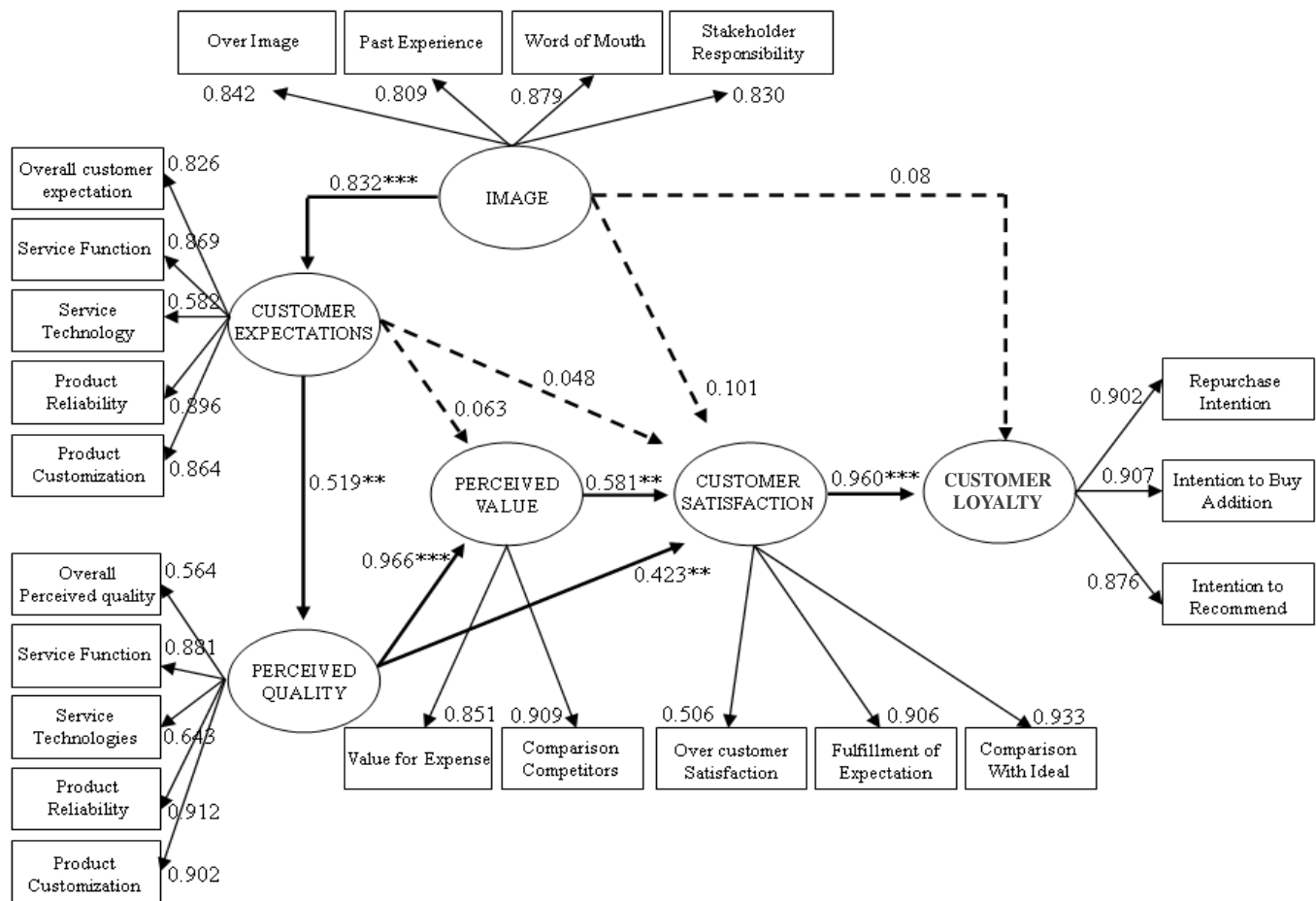
which was a big research sample, the parameters of the study model were estimated by the Maximum likelihood estimation (MLE). By statistical analysis, the fitness index

of the assumed model is  $\chi^2/d.f = 2.446$ , GFI = 0.954, AGFI = 0.908, CFI = 0.980, NFI = 0.976, RMSEA = 0.046, the index fitness of the model is good.

**Table 2.** Discriminant validity of constructs.

Construct	Image	Customer expectation	Perceived quality	Perceived value	Customer satisfaction	Customer loyalty
Image	<b>0.706<sup>a</sup></b>					
Customer expectation	0.384	<b>0.665<sup>b</sup></b>				
Perceived quality	0.142	0.266	<b>0.631<sup>c</sup></b>			
Perceived value	0.111	0.079	0.483	<b>0.775<sup>d</sup></b>		
Customer satisfaction	0.092	0.068	0.222	0.273	<b>0.649<sup>e</sup></b>	
Customer loyalty	0.886	0.082	0.196	0.204	0.443	<b>0.801<sup>f</sup></b>

a, b,c,d,e,f represent the shared variance of each construct.



**Figure 2.** The result of path analysis for Medical Center-TCSI. \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

A path analysis of latent variables (that is, constructs) is shown in Figure 2.  $\gamma_i$  represents the standardized path coefficients of  $i$  the path in this model. The results of a path analysis showed that image has a significantly positive effect on customer expectation ( $\gamma = 0.832$ ,  $p < 0.001$ ), but image does not have a significantly positive effect on customer satisfaction ( $\gamma = 0.101$ ,

$p > 0.05$ ) and customer loyalty ( $\gamma = 0.08$ ,  $p > 0.05$ ). Customer expectation has a significantly positive effect on perceived quality ( $\gamma = 0.519$ ,  $p < 0.01$ ), but customer expectation does not have a significantly positive effect on perceived value ( $\gamma = 0.063$ ,  $p > 0.05$ ) and customer satisfaction ( $\gamma = 0.048$ ,  $p > 0.05$ ). In addition, perceived quality has a significantly positive effect on perceived

**Table 3.** The indirect effect of the medical center-TCSI.

Construct	Image	Customer expectation	Perceived quality	Perceived value	Customer satisfaction	Customer loyalty
Customer expectation	-	-	-	-	-	-
Perceived quality	0.432	-	-	-	-	-
Perceived value	0.470	0.501	-	-	-	-
Customer satisfaction	0.596	0.757	0.561	-	-	-
Customer loyalty	0.669	0.795	0.945	0.558	-	-

**Table 4.** The overall effect of the medical center-TCSI.

Construct	Image	Customer expectation	Perceived quality	Perceived value	Customer satisfaction	Customer loyalty
Customer expectation	0.832	-	-	-	-	-
Perceived quality	0.432	0.519	-	-	-	-
Perceived value	0.470	0.564	0.966	-	-	-
Customer satisfaction	0.697	0.805	0.984	0.581	-	-
Customer loyalty	0.779	0.795	0.945	0.558	-	-

value ( $\gamma = 0.966$ ,  $p < 0.001$ ) and customer satisfaction ( $\gamma = 0.423$ ,  $p < 0.01$ ). Perceived value has a significantly positive effect on customer satisfaction ( $\gamma = 0.581$ ,  $p < 0.01$ ), and customer satisfaction has a significantly positive effect on customer loyalty ( $\gamma = 0.960$ ,  $p < 0.001$ ). Based on the above analysis, this study showed that  $H_3$ ,  $H_4$ ,  $H_7$ ,  $H_8$ ,  $H_9$ , and  $H_{10}$  were supported.

From the indirect effect of the medical center -TCSI model (Table 3), the most important forecast variable for the indirect forecast effect of customer loyalty is perceived quality (0.945), followed by customer expectation (0.795), image (0.669) and perceived value (0.558). Next, the most important forecast variable for indirect effect of customer satisfaction is customer expectation (0.757), followed by image (0.596) and perceived quality (0.561).

In the overall effect (that is, direct effect plus indirect effect), as in table 4. If the image is set as the forecast variable and other variables are result variables, the maximum overall effect value is image to customer expectation (0.832), then image to customer loyalty (0.779), customer satisfaction (0.697), perceived value (0.470), and perceived quality (0.432). If the customer expectation is set as the forecast variable, other variables are result variables. The maximum overall effect value is customer expectation to customer satisfaction (0.805), then customer expectation to customer loyalty (0.795), perceived value (0.564), and perceived quality (0.519). If the perceived quality is set as the forecast variable and other variables are result variables, the maximum effect value is perceived quality to customer satisfaction (0.984), perceived value (0.966) and customer loyalty (0.945). If the perceived value is set as the forecast variable and other variables as the result variables, the maximum effect value is perceived value to customer satisfaction (0.581), then perceived value to customer

loyalty (0.588).

## DISCUSSION AND CONCLUSIONS

The study mainly discusses the customer (that is, patient) satisfaction regarding medical centers in the process of medical care and carries out forecast analysis by the TCSI model. The conclusions are summarized as follows: Firstly, the images of medical centers in Taiwan do not obviously forecast effect and influence regarding customer satisfaction and customer loyalty, the research result differentiates from the assumption that image has a positive influence on customer loyalty (Bloemer and Ruyter, 1997; Bloemer et al., 1998; Hu et al., 2009). This study believes that the differences between hospital expertise and the national special concept of medical care caused the difference in perception. Meanwhile, Taiwanese frequently go to different clinics or hospitals for the same disease or health problem within one week, as did Japanese and people from Hong Kong. The main result shows that image influenced the customer expectation most. Although image does not directly influence customer satisfaction and customer loyalty, from the overall satisfaction forecast, image can indirectly influence customer satisfaction and customer loyalty through customer expectation, perceived quality and perceived value.

By observing the relation between customer expectation and other factors through a direct effect forecast, the main result shows that customer expectation of medical care is of the greatest influences on perceived quality. Customer expectation does not directly influence perceived value and customer satisfaction. The findings closely correspond to the results of Martensen et al. (2000). For industrial characteristics, the people's



expectations usually cannot meet the perception of the specialty of the medical care industry, that is, people usually expect more than the perception from the medical care industry. When the actually experienced service quality is worse than expected, the perceived value, customer satisfaction and loyalty are correspondingly lower, but people still expect to meet their medical needs.

For the relation between the perceived quality and other factors, the main result shows that the perceived quality influences the perceived value the most, then the customer satisfaction. The perceived value directly influences customer satisfaction and indirectly influences customer loyalty. The higher the perceived quality and perceived value are, the higher the customer satisfaction. Customer satisfaction directly influences customer loyalty. This result is consistent with the study result of Chaska (2006), Moliner (2009) and Naidu (2009). Therefore, to improve patient satisfaction and loyal must start from the perceived quality, while the improvement of perceived quality mainly concentrates on the improvement of hardware, including the staff's ability, knowledge and service. The findings closely correspond to the results of Yesilada and Direktör (2010). Therefore, to enhance the patient to the medical center's perceived value and perceived quality, the medical center should take the initiative to understand the different needs of patients and provide appropriate care for patients through the different needs. This also echoes Fitzpatrick and Hopkins (2008) pointed out that patients' varying concerns with regard to their illness need to be more directly considered in explaining different responses to medical consultations.

Similar to Chen et al.'s (2006) research result, the result of this study shows that customer expectation cannot directly forecast customer satisfaction and customer loyalty in medical centers. Taiwanese currently do not go to different departments to receive medical care after consulting the family doctor, and usually go to hospitals based on personal experience. Therefore, when their symptoms aren't relieved in a short period of time, they seek another doctor in another hospital. Usually they turned to 3.9 hospitals, 5.2 medical care personnel and 3.4 professional medical experts for the same disease in one year, on average. Therefore, the image of medical care institutions is difficult to establish, the customer expectation to rapidly remove his/her symptoms greatly influences the customer satisfaction and customer loyalty. However, this may involve medical care ethics and morality, which deserves the researcher's deep discussion for its positive and negative relation, as well as the influence.

### Managerial implications

Medical treatment is a highly professional skill. The final say is almost dominated by medical care personnel. Unlike the common service industry, the right of

determination belongs to the consumer himself/herself, in addition to the specialty of the medical care industry—inequity of information results in customer difficulty to understand the majority of medical care personnel. Further, the medical care industry in Taiwan suffers from insufficient human resources and the personnel in the industry often work overtime. All these may result in inefficient communication between patients and hospitals (medical centers), which may influence customer satisfaction. The small image difference regarding the medical industry recognized by people, such as its property of social welfare, that is no unique individuality, results in the failure of the image to influence customer satisfaction.

Hospital image does not relate to customer satisfaction. Sometimes it is because there are too many patients. The large medical care center had to prolong the patients' waiting time. The patients from afar spent a large amount of time on their way to the medical centers and they were unfamiliar with the large institution with various departments and offices. All of these factors lowered people's satisfaction with large medical institutions. Thus it is suggested that medical centers can build the desired image through various marketing and communication methods to increase people's perception of medical centers. Image doesn't directly influence customer satisfaction and loyalty. They shall devote themselves to how to allow the customers to feel the sounded medical quality and enhance the patient's medical value. For example, enhancing the service quality of medical personnel, and the medical hardware equipment, these are the quality items that patients can easily have direct feeling for. After all, the fee charged in medical centers is far higher than general clinics. In this way, it will allow the patients to feel that it is worth paying the cost. Enhancing the medical comments of patients regarding the medical centers will effectively enhance the patients' medical service satisfaction and loyalty, and receive the competitive advantage in the market.

Furthermore, it is suggested that the top management of medical centers should be fully aware of the difficulties and fierce competition faced by hospitals in Taiwan and they should understand that the development of hospitals does not rely on price competition, as Taiwan has implemented compulsory health care, but on satisfactory medical service quality, by which to win the customer's trust and stimulate their willingness to go to that hospital next time, to lay the foundation for continued operation. Therefore, the relation between medical service quality and customer satisfaction deserves further discussion.

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