Identifying the Key Factors of Service Quality in a Traditional Chinese Medicine Clinic-based Kano-IPA Model and Case Study

Chien-Chih Wang [1] , Hsin-Hao Chen [1]

[1]*Department of Industrial Engineering and Management, Ming Chi University of Technology, Taiwan*

Abstract **–Traditional Chinese medicine (TCM) hospitals include small National Health Insurance clinics and private clinics. However, the medical service quality that patients receive here is unknown. This study evaluated the relevant literature and doctors' and physicians' experiences to design a questionnaire using a two-dimensional quality model. The importance-performance analysis was applied to evaluate medical service quality and satisfaction after patients received the treatment. The data from the patients in New Taipei City were collected and statistically analyzed. The results show that six factors of the TCM clinical medical service quality fall within the fourth quadrant of high importance and low performance. This information can be provided to the TCM industry to improve medical service quality in the future.**

Keywords **–Attractive Quality, Questionnaires, Statistical Analysis, New Taipei City.**

1. Introduction

The National Health Insurance Administration of the Ministry of Health and Welfare created the National Health Insurance statistics report in 2009. This report shows satisfactory status to medical service quality in the traditional Chinese medicine (TCM) industry. From 2005 to 2010, patient satisfaction regarding medical service quality in TCM clearly decreased. Satisfaction with treatment only reached 60–70% in 2006–2010, whereas satisfaction with medical equipment was only 55–70% in 2001–2010 [1].

Recently, the doctor-patient relationship has been focused on, and medical service quality and medical safety are required for patients. Large-scale Western medicine hospitals have ISO international quality management system certifications that have standard operating procedures for medical service quality, service desk, and staff. For example, Taoyuan Chang Gung Memorial Hospital conducted a questionnaire in 2011–2013 to improve medical service quality for outpatients, inpatients, and emergency patients.

TCM hospitals include small National Health Insurance clinics and private clinics in Taiwan. These hospitals lack resources, funding, and staff to receive the quality management system certifications of large-scale Western medicine hospitals, which conduct satisfaction questionnaires to obtain these data. Consequently, it is unknown whether patients receive satisfactory TCM medical service quality and demonstrate satisfactory healing efficacy.

In the present study, we cooperated with clinic physicians to explore whether TCM clinics require general service quality items (elements) in the medical service process for the patients. Relevant literature was examined to design questionnaires and collect data [2,3,4]. The Kano model and importance-performance analysis (IPA) research methods were adopted to assess the needs of the patients regarding TCM medical service quality and to determine whether satisfactory healing efficacy was provided by the TCM doctor and clinic. This study aimed to improve TCM medical service quality and satisfactory healing efficacy.

DOI: 10.18421/TEM72-09
https://dx.doi.org/10.18421/TEM72-09

Corresponding author: Chien-Chih Wang,
Department of Industrial Engineering and Management, Ming Chi University of Technology, Taiwan
Email: ieccwang@mail.mcut.edu.tw

Received: 10 February 2018.
Accepted: 02 April 2018.
Published: 25 May 2018.

2. Methodology

2.1 Questionnaire design and data collection

The Donabedian structure, process, and outcome dimensions were used [5,6] to design the questionnaire, which was assessed using the Kano two-dimensional quality model. The TCM clinical medical service process is divided into pre-treatment (structure), treatment (process), and post-treatment (outcome) periods; the importance and expectation of these services were evaluated in the patient questionnaire. The questionnaire was randomly administered to patients receiving treatment and was completed immediately. The questionnaire, which assessed patient views on expected service and satisfaction of perceived services in TCM clinical medical service quality items (elements), included 22 items regarding medical service quality in TCM clinics.

2.2 Kano two-dimensional quality model

The Kano two-dimensional quality element attribute evaluation table [7] shown in Table 1, which was designed by Matzler and Hinterhuber, classifies a patient's response to the questions. Two positive responses with negative cross-comparisons were used to obtain the A, O, M, I, R, and Q categories for quality element attributes, which represent attraction quality (A), one-dimensional quality (O), must-be quality (M), indifferent quality (I), reverse quality (R), and questionable result (Q). This model utilized patients in the Xinzhuang Dist., New Taipei City, Taiwan TCM clinic who were assessed in terms of medical service quality items.

Table 1. Kano two-dimensional quality element attribute evaluation table

TCM clinic medical service quality element	Patient Requirement	Patient response negative question (The medical service quality element is satisfaction)				
		Like	Must-be	No Feeling	Accept	Dislike
Patient response positive question (The medical service quality element is unsatisfactory)	Like	Q	A	A	A	O
	Must-be	R	I	I	I	M
	No Feeling	R	I	I	I	M
	Accept	R	I	I	I	M
	Dislike	R	R	R	R	Q

Based on the quality attribute determination formula by Gitlow, the patients classified each medical service quality element attribute as attractive (A), one-dimensional (O), must-be (M), and indifferent (I). The cumulative frequency of each medical service quality is compared using (M + O + A) and (I + R + Q). Finally, it is determined based on the following rules to which type the patients' needs belongs [8]. Rule 1 is if (M + O + A) > (I + R + Q), then the patients' needs are given by Max {M, O, A} medical service quality element. Rule 2 is if (M + O + A) < (I + R + Q), and then the patients' needs are given by the MAX {I, R, Q} medical service quality element. This becomes the final two-dimensional quality element attribute classification result [9,10].

Matzler and Hinterhuber [7] and Berger [9] proposed the customer satisfaction coefficient index. This index analyzes the extent of increased customer satisfaction and decreased dissatisfaction when a particular quality element attribute is improved. It becomes an improvement service quality analysis method. Therefore, this study used the customer satisfaction coefficient index as its analysis method to assess improvement in TCM clinical medical service quality elements by analyzing the degree of increased patient satisfaction and decreased dissatisfaction. The patient (customer) satisfaction coefficient index and patient (customer) dissatisfaction decrement index formula is given by.

- Patient (customer) satisfaction increment index (SII)

$$\mathrm{SII} = \frac{\mathrm{A} + \mathrm{O}}{\mathrm{A} + \mathrm{O} + \mathrm{M} + \mathrm{I}}$$

- Patient (customer) dissatisfaction decrement index (DDI)

$$\mathrm{DDI} = \frac{-(\mathrm{O} + \mathrm{M})}{\mathrm{A} + \mathrm{O} + \mathrm{M} + \mathrm{I}}$$

Next, the SSI value and DDI value of all items of the TCM clinic medical service quality element were respectively summed up after calculating the total average value. Both the patient satisfaction increment index and patient dissatisfaction decrement index values were compared between each TCM clinical medical service quality item and the total average value. The total average value is the center point of the figure. The x-axis represents the 「patient satisfaction increment index」, and the y-axis represents the 「patient dissatisfaction decrement index」; these axes create a four-quadrant graph. If a TCM clinical medical service quality item falls within the first quadrant, this item must be a prioritized improvement goal. Improving this item will result in the greatest benefit to that TCM clinical medical service quality element, leading to substantially increased satisfaction and decreased dissatisfaction.

2.3 Importance-Performance Analysis

Martilla and James proposed the IPA method to understand the importance and performance of the TCM clinical medical service quality elements in patients, which was assessed in every item of patients' responses [11]. The average value of the

importance and performance of the TCM clinical medical service quality elements was calculated for each item. First, the separate importance and performance values were calculated for each TCM medical service quality item, after which the total average value was determined.

Furthermore, the importance and performance average values were compared to the total average value. The total average value is the center point of the figure. The x-axis represents 「patient importance」, and the y-axis represents 「patient performance」. These axes are used to create a four-quadrant graph. Implications of medical service quality elements in patients in the Xinzhuang Dist., New Taipei City, Taiwan TCM clinic were analyzed based on their quadrant location. If a medical service quality item of patients in the Xinzhuang Dist., New Taipei City, Taiwan TCM clinic falls within the fourth quadrant, improvement of this element must be prioritized. Consequently, this element became a key priority element. This study explores key TCM clinical medical service quality elements in patients in Xinzhuang Dist., New Taipei City, Taiwan.

3. Analysis and Discussion

This study proposed Kano two-dimensional quality model analysis to improve the efficiency of TCM clinical medical service quality and prioritizes which TCM clinical medical service quality elements must be improved based on the IPA method.

Prioritizing vital few elements and improving TCM clinical medical service quality elements in the Xinzhuang Dist., New Taipei City, Taiwan TCM clinic must occur in a most cost-effective manner. Focusing on these elements can quickly improve the TCM clinical medical service quality patient satisfaction. The Kano and IPA analyses were combined to prioritize the necessary improvements. The results are showed in Table 2, 3, 4.

Table 2. Integration Kano and IPA application analysis for the strategy-1

Quadrant I (Keep up the good work)-high importance and high performance. The current high importance and high performance medical service quality element attributes for patients	
A	High TCM clinic medical service quality will attract more patients. The rate of return will increase; the recommended rate will also increase. Improved service quality is a competitive business strategy advantage in TCM clinics.
O	TCM clinics are able to provide satisfactory service quality to meet their patients' needs despite their limited resources. Therefore, the more services we provide, the more competitive the business strategy is to other TCM clinics. It is a 「Keep up the good work」 item.
M	The service quality of these items must be satisfactory to meet the patient's needs. To avoid patients being dissatisfied, these items must be immediately improved. Addressing these will help TCM clinics increase revenue. Consequently, they must 「keep up the good work」.
The item of main competitive advantages for business strategy. Determine the order of prioritizing improvement = A **>** O **>** M	

Table 3. Integration Kano and IPA application analysis for the strategy -2

Quadrant II (Possible overkill)-low importance and high performance. The current low importance and high performance medical service quality element attributes for patients	
A	The service quality of TCM clinics is unappealing for patients. Their limited resources should be reallocated away from these service quality items.
O	Patients are very satisfied with the service quality, and their needs are adequately met. TCM clinics can use their limited resources to improve the poor quality elements.
M	The service quality of TCM clinics has no effect on patient satisfaction because it has met patient needs. Therefore, the service quality cannot prevent patient dissatisfaction.
TCM clinics must avoid excessive resource investment. Therefore, these items are sub-prime competitive advantages in terms of business strategy.	
Quadrant III (Low priority)-Low importance and low performance. The current low importance and low performance medical service quality element attributes for patients	
A	The TCM clinic does not use much resources on these service quality elements because they do not significantly affect patients' results and result in unattractive use of resources.
O	These TCM clinic medical service quality items do not immediately affect patients when there are sufficient resources. However, these items must still meet patient's needs to prevent dissatisfaction.
M	The service quality of TCM clinics must meet basic standards to reduce patient dissatisfaction. Although improvement is not a necessity, services must still be adequately provided.
These items are a sub-prime competitive disadvantage in terms of TCM clinic business strategy. Therefore, consider improving these items after key service quality elements are addressed.	

Table 4. Integration Kano and IPA application analysis for the strategy -3

Quadrant IV (Concentrate Here)-high importance and low performance. The current high importance and low performance medical service quality element attributes for patients	
A	For TCM clinics, the service quality is more dissatisfied for patient's attention to performance expression to reduce dissatisfaction of patients need to prioritizing improvement. Consequently, these are not key elements of a successful business strategy. Whether the service items are improved for patients is essentially irrelevant.
O	The service quality of TCM clinics significantly affects patient dissatisfaction and must be improved. Therefore, the more the items are improved, the more the dissatisfaction of patients is reduced. Consequently, this is a prioritized improvement item.
M	There is a perquisite basic standard of service quality items offered to patients. If they do not feel that there are sufficient elements, they will be dissatisfied and the rate of return will be lower. Consequently, this item must be prioritized for improvement. Improving more items will result in lower patient dissatisfaction.
These items are the main competitive disadvantage in TCM clinics in terms of business strategy. Determining the priority of improvements = M > O > A	

Prioritized improvements for TCM clinical key medical service quality elements are shown in Table 5

In Table 6, the Kano two-dimensional quality improvement results showed that six TCM clinical medical service quality items fell in the first quadrant (satisfaction increment is bigger and dissatisfaction decrement is bigger). Consequently, improving these service quality items provides the greatest benefit.

Table 5. Prioritized improvements for TCM clinical key medical service quality elements

Improvement Rank	TCM Clinical Medical Service Quality Element	Primary Dimension; Secondary Dimension	Kano Two-Dimensional Quality Element Attributes	Importance Rank
1	Kano and IPA: The doctor has professional skills, abundant experiences, and great virtues.	Treatment period; Assurance	M	1
2	IPA: The doctor is patient during the treatment process.	Treatment period; Empathy	M	3
3	Kano: The doctor chooses the right treatment strategies and body position.	Treatment period; Reliability	O	5
4	IPA: The doctor provides accurate treatment time, correctly performs acupuncture and moxibustion for patients.	Treatment period; Reliability	O	9
5	Kano: The clinic environment is neat, and the clinic nameplate is visible.	Pre-treatment; Tangibles	O	12
6	Kano: The medical professional has a good service attitude, is courteous, and cares for patients.	Treatment period; Assurance	O	15
7	IPA: Appointments can be quickly made, and receptionists are friendly.	Pre-treatment; Responsiveness	A	19

Table 6. Improving TCM clinical medical service quality elements for the greatest benefit

First quadrant (satisfaction increment is bigger and dissatisfaction decrement is bigger) 「 Improving the TCM clinical medical service quality elements for the greatest benefit	Primary Dimension; Secondary Dimension
「The doctor is patient during the treatment process」	Treatment period; Empathy
「The doctor answers questions and concerns in detail」	Treatment period; Responsiveness
「The doctor chooses the right treatment strategies and body position」	Treatment period; Reliability
「The doctor has professional skills, abundant experiences, and great virtues」	Treatment period; Assurance
「Patients feel progress after treatment」	Post-treatment; Assurance
「The Chinese material powder and soup were beneficial」	Post-treatment; Assurance

IPA medical service quality element results showed that six TCM clinical medical service quality items fell within the fourth quadrant of high importance and low performance (concentrate here) in Table 7. Hence, these are key quality elements that must be prioritized. In the combined analysis, the Kano Two-Dimensional Quality Model and IPA method determined the priority of the items for improvement. Therefore, the combined analysis used the Kano two-dimensional quality model analysis to determine the elements that would result in the greatest benefit with improvement and the IPA method to prioritize the medical service quality elements for improvement. If the Kano Two-Dimensional Quality Model and IPA have the same item, it will be as the first priority for improvement. After that, the priority of key medical service quality elements is determined using the two-dimensional quality element attribute classification results and the importance rank of the TCM clinical medical service quality elements based on the IPA method.

Table 7. Prioritized TCM clinical medical service quality elements needing improvement

Fourth quadrant 「High importance and low performance- (concentrate here) 「Prioritized TCM clinical medical service quality elements needing improvement」 「Key quality element」	Primary Dimension; Secondary Dimension
「The clinic environment is neat, and the clinic nameplate is visible」	Pre-treatment; Tangibles
「When patients complain, a doctor properly handles the treatment process」	Treatment period; Responsiveness
「During the treatment process, the medical professional pays attention to patient's discomfort 『Acupuncture and moxibustion result in discomfort』 」	Treatment period; Empathy
「The medical professional has a good service attitude, is courteous, and cares for thepatients」	Treatment period; Assurance
「Patients feel progress after treatment」	Post-treatment; Assurance
「The Chinese material powder and soup are beneficial」	Post-treatment; Assurance

Thus, the combination of the two analytical methods determined that the medical service quality elements 「Patients feel progress after treatment」 and 「The Chinese material powder and soup are beneficial」 were important and necessary for patients in the Xinzhuang Dist., New Taipei City, Taiwan TCM clinic. The results of the Kano Two-Dimensional Quality Model and the IPA method reported these two TCM clinical medical service quality elements. Consequently, these two items are prioritized as key medical service quality elements. Applying the Kano Two-Dimensional Quality Model and Importance-Performance Analysis method to illustrate. The order of prioritizing improvement results is shown in Table 8.

Table 8. The prioritized improvement determination results for TCM clinical key medical service quality elements

Improvement Rank	TCM Clinical Medical Service Quality Elements	Primary Dimension; Secondary Dimension	Kano Two-Dimensional Quality Element Attribute	Improvement Rank
1	Kano and IPA 「Patients feel progress after treatment」 「The Chinese material powder and soup were beneficial」	Post-treatment; Assurance / Post-treatment; Assurance	O	10 15
2	Kano: 「The doctor has professional skills, abundant experiences, and great virtues」	Treatment period; Assurance	O	2
3	IPA: 「During the treatment process, the medical professional pays attention to patient discomfort 『acupuncture and moxibustion result in discomfort』」	Treatment period; Empathy	O	3
4	Kano: 「The doctor is patient during the treatment process」 「The doctor answers questions and concerns in detail」	Treatment period; Empathy/ Treatment period; Responsiveness	O	4
5	Kano: 「The doctor chooses the right treatment strategies and body position」	Treatment period; Reliability	O	7
6	IPA: 「The medical professional has a good service attitude, is courteous, and cares for the patients」	Treatment period; Assurance	O	9
7	IPA: 「When patients complain, the doctor properly handles the treatment process」	Treatment period; Responsiveness	O	11
8	IPA: 「The clinic environment is neat, and the clinic nameplate is visible」	Pre-treatment; Tangibles	O	13

Conversely, both the TCM medical service quality elements 「Patients feel progress after treatment」 and 「The Chinese material powder and soup were beneficial」 of the Kano Two-Dimensional Quality Model and the IPA method were dimensions of post-treatment (outcome) requiring patient attention in the Xinzhuang Dist., New Taipei City, Taiwan TCM clinic. Patients hope that their body heals quickly after treatment. Consequently, both 「Patients feel progress after treatment」 and 「The Chinese material powder and soup are beneficial」 are prioritized by patients. In summary, the Xinzhuang Dist., New Taipei City, Taiwan TCM clinic should prioritize patient needs by spending more resources and energy on these key medical service quality elements.

4. Conclusion

A doctor-patient relationship must be established to achieve satisfactory medical service quality and medical safety for patients. However, it is unknown whether patients receive satisfactory medical service quality. This study designed a questionnaire to assess doctor and physician experiences. The Kano Two-Dimensional Quality Model and IPA method were adopted to identify key factors of medical service quality and satisfactory healing efficacy for small National Health Insurance clinics and private clinics of the TCM hospitals.

The results showed that six factors of the TCM clinical medical service quality fell within the fourth quadrant of high importance and low performance. Hence, improving these TCM clinical medical service quality factors is a priority. The six priority factors are as follows: the clinic environment is neat, and the clinic nameplate is visible; when patients complain, the doctor properly handles the treatment process; during the treatment process, the medical

professional pays attention to patient discomfort with acupuncture and moxibustion; the medical professional has a good service attitude, is courteous, and cares for the patients; the patients feel progress after treatment; and the Chinese material powder and soup are beneficial. The medical service quality satisfaction and quality improvement strategies can be provided to the TCM clinics for future reference.

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