



## Applying Two-Dimensional Quality Model for Identifying Critical Factors of Service Quality: A Case Study on Traditional Chinese Medicine Clinic in Taiwan

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### **Authors' contributions**

*This work was carried out in collaboration between both authors. Authors CCW and HHC designed the study, wrote the protocol and wrote the first draft of the manuscript. Author HHC collected the data and searched for the literatures. Authors CCW and HHC analyzed the results. Both authors approved the final manuscript.*

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### **ABSTRACT**

**Objective:** Traditional Chinese Medicine clinics (TCM) are small, National Health Insurance and private clinics in Taiwan. Measuring patient satisfaction is very difficult due to limited resources. Therefore, helping these clinics to improve service quality and satisfaction of provided treatment is an important issue for improving performance in TCM.

**Methods:** This study involved administering a questionnaire to investigate the quality attributes of the TCM clinic and medical service quality to increase patient satisfaction. The Kano two-dimensional quality model questionnaire design for the TCM clinic included pre-treatment (structure), treatment period (process), and post-treatment (outcome). Subjects seeking treatment at a TCM in New Taipei City were sampled. Data was collected and analyzed.

**Results:** Patients pay attention to service quality. In this study, service quality was classified using attraction quality, one-dimensional quality, must-be quality, or indifferent quality. The 25 TCM clinic

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medical service quality factors have 2 medical service quality factors that the subjects classified as attractive.

**Conclusion:** Two attractive qualities were identified as care support issues that involved convenient transportation and waiting room amenities. If TCM clinics wish to attract more patients, these two factors of attractive quality require to be addressed by providing similar services and incorporating future improvement goals to address service quality.

*Keywords: Kano model; traditional Chinese medicine; medical service quality; patient satisfaction.*

## 1. INTRODUCTION

In recent years, acceptance of TCM in the United States, Canada, Europe, Southeast Asia and other countries has gradually increased. Acupuncture, tuina, qigong, Chinese herbs, and other therapies have gained acceptance. Conversely, TCM is facing opposition in Taiwan. For example, the entrance school quota of traditional Chinese medical education was reduced and post-baccalaureate TCM was canceled. In assuring quality case of the TCM outpatient care global budget payment system of the National Health Insurance (NHI) was established review global budget payment of medical service quality indicators [1]. The Chinese acupuncture disposal monitoring number of times programs that per month cannot be more than 15 times. However, TCM is deeply rooted in Taiwanese culture where people like tuina and take Chinese herbs to support a healthy lifestyle. With a greater focus in recent years on health care, most people prefer TCM treatment.

In 2009, according to the NHI administration of Ministry of Health and Welfare (MHW) shows national health insurance statistics data. From 2005 to 2010, patient satisfaction of TCM service trended downward. More recently, the provider-patient relationship has been emphasized. Medical service quality and safety are patient requirements. Large-scale western hospitals have adopted the ISO international quality management system certification and Standard Operation Procedures (SOP) of medicine service quality, but general TCM hospitals are small NHI clinics and private clinics in Taiwan. These hospitals would like to get quality management system certification and undertake satisfaction survey and data analysis, but need a means to do so without shouldering immense financial and human resources. Without this data, it is impossible to gauge patient satisfaction and levels of TCM service quality and safety.

Research results will provide reference for TCM doctors and clinics in improving TCM service

quality, safety, and patient satisfaction. This study will explore patient demand for TCM service quality and rehabilitation efficacy by application of the Kano two-dimensional quality model.

## 2. METHODOLOGY

This paper is based on Donabedian's structure, process, and outcome dimension [2,3] by the application of the Kano two-dimensional quality model to study the quality attributes of the TCM clinic medical service. This study summarizes the patients' service quality expectations during the TCM clinic medical services process by analysis of literature and discussion with clinic physician. The questionnaire design applies the Kano two-dimensional quality model and undertakes the survey for the TCM clinic medical services process including pre-treatment (structure), treatment period (process), and post-treatment (outcome). Questionnaires were completed via random sampling by TCM clinic patients at the Xinzhuang Dist., New Taipei City, Taiwan (R.O.C.).

After the questionnaires were completed, elements of the TCM clinic medical service quality were classified into the following four categories: attraction quality (A); one-dimensional quality (O); must-be quality (M); and indifferent quality (I).

The questionnaire design for the elements of medical service quality of traditional Chinese medicine clinic refers the relevant literature and researcher seeing the doctor-patient interaction as well as a discussion with the attending physician [4-7]. The questionnaire was divided into the following three parts:

### 2.1 General Information

Patient general information including gender, age, marital status, education, occupation, monthly income, and current residence.

## 2.2 Synthesis Assessment

Medical treatment status of patients includes the following: (1) self-health status; (2) which is more frequently selected, TCM or western medicine; (3) how often is TCM accessed; (4) reasons for choosing TCM; (5) which illnesses or diseases treated by TCM, healing efficacy; and (6) recovery experience

## 2.3 Kano Two-Dimensional Quality Attributes Survey

The issue of the questionnaire was divided into active and negative sides by application of the Kano two-dimensional quality questionnaire mode. The questionnaire was designed using the five quality elements of the Kano model and a two-dimensional model questionnaire mode [8]. The questionnaire has five options: like, must-be, neutral, live with, and dislike.

## 3. ANALYSIS RESULTS AND DISCUSSION

The object of study for 31 patients of the Xinzhuang Dist., New Taipei City, Taiwan (R.O.C.) TCM clinic was data collection. The first part involved the analysis of patient demographics. The results are shown in Table 1. Table 1 shows subject gender is mainly female (54.84%); the age is mainly 30-39 years (38.71%); next is 40-49 (35.48%); the marital status is primarily married (64.52%); the education is mainly based on university (35.48%); next is Institute of technology (32.26%); the occupation is mainly based on Business (32.26%); the monthly income is primarily based on 40,001-50,000 (29.03%); next

is 30,001–40,000 (22.58%); the current residence is mainly based on New Taipei City (90.32%).

The second part of our analyses involved a summative assessment. for example: Self-health status of patient, Do patients often see TCM or western medicine, How often do patients see TCM, What reason do patients come clinic for treatment? What illness do patients see TCM, Healing efficacy of patients, How long do patients recover from the illness? The results are shown in Table 2.

The Table 2 shows self-health status is mainly based on 「So-so」 (64.52%); Do patients often see TCM or western medicine? Is mainly based on 「Both TCM and western medicine」 (48.39%), next is 「TCM」 (45.16%); How often do patients see TCM? Is mainly based on 「3-7 days」 (35.48%); What reason do patients come clinic for treatment? Is mainly based on 「I have been here. It works for me」 (14 people), secondly is 「Close to home」 (13 people), thirdly is 「Recommended by relatives and friends」 (12 people), next is 「Good service attitude」 (11 people); What illness do patients see TCM? Is mainly based on 「Digestive system」 and 「Respiratory system」 (both there are 8 people), secondly is 「Health-preserving and adjustment physique」 (7 people), next is 「Nerve system」 (6 people); Healing efficacy of patients is mainly based on 「good」 (54.84%); How long do patients recover from the illness? Is mainly based on 「More than three months」 (32.26%).

Table 1. General information analysis for patients

Patients background	General information	Number of people	Percent (%)
Gender	Male	14	45.16
	Female	17	54.84
Age	Under 20	0	0.00
	20-29	4	12.90
	30-39	12	38.71
	40-49	11	35.48
	50-59	4	12.90
	60 or above	0	0.00
Marital status	Single	10	32.26
	Married	20	64.52
	Others	1	3.23
Education	Elementary school	0	0.00
	Junior high school	0	0.00

<b>Patients background</b>	<b>General information</b>	<b>Number of people</b>	<b>Percent (%)</b>
Occupation	Senior high school	6	19.35
	Institute of technology	10	32.26
	University	11	35.48
	Graduate school	4	12.90
	Farmer	0	0.00
	Worker	6	19.35
	In Business	10	32.26
	Government departments	2	6.45
	Service industries	4	12.90
	Student	2	6.45
Monthly income	Others	7	22.58
	Less than 20,000 NTD	4	12.90
	20,001- 30,000 NTD	5	16.13
	30,001- 40,000 NTD	7	22.58
	40,001- 50,000 NTD	9	29.03
	50,001- 60,000 NTD	2	6.45
Current residence	More than 60,001 NTD	4	12.90
	Taipei City	3	9.68
	New Taipei City	28	90.32
	Taoyuan County	0	0.00
	Others	0	0.00

**Table 2. Synthesis assessment analysis**

<b>Synthesis assessment</b>	<b>Options</b>	<b>Number of people</b>	<b>Percent (%)</b>
Self-health status	Great	1	3.23
	Good	8	25.81
	So-so	20	64.52
	Not good	2	6.45
	Very bad	0	0.00
Do You often see TCM or western medicine?	TCM	14	45.16
	Western medicine	2	6.45
How often do you see TCM?	Both TCM and western medicine	15	48.39
	3-7 day	11	35.48
	2 week	5	16.13
	3 week	3	9.68
	1-2 months	5	16.13
	More than 3 months	7	22.58
What reason will you come to clinic for treatment? (multiple choices)	Good service attitude	11	
	Close to home	13	
	Waiting time is short	0	
	Well-known doctor	4	
	Recommended by relatives and friends	12	
What illness will you see TCM? (multiple choices)	I have been here. It works for me	14	
	Others	4	
	Circulatory system	1	
	Digestive system	8	
	Respiratory system	8	
	Locomotion system	4	
	Endocrine system	0	
	Reproductive system	2	
Urinary system	0		

Synthesis assessment	Options	Number of people	Percent (%)
Healing efficacy	Immune system	0	
	Nervous system	6	
	Skin system	4	
	Health-preserving and adjustment physique	7	
	Tuina and rehabilitation	2	
	Chinese medicine diet	0	
	Others	0	
	Great	6	19.35%
	Good	17	54.84%
	So-so	7	22.58%
How long do you recover from the illness?	Not good	0	0.00%
	Very bad	1	3.23%
	3-7 day	7	22.58%
	2 week	6	19.35%
	3 week	3	9.68%
	1-2 months	5	16.13%
	More than 3 months	10	32.26%

The third part of our analysis involved patient satisfaction. For this, we applied the Kano two-dimensional quality attributes as well as classification. The final results are as follows:

### 3.1 Attractive Quality 「A」

Twenty-five elements of TCM clinic medical service quality have 2 elements of medical service quality that are classified as attractive qualities. The two elements of attractive qualities have:

- The clinic nearby transportation is convenient
- If patients wait too long, the clinic provides drinking water, books, newspapers and watching television service

### 3.2 One-Dimensional Quality 「O」

The 25 elements of TCM clinic medical service quality have 23 elements of medical service quality that are classified as one-dimensional qualities. The 23 elements of one-dimensional qualities have: The clinic environmental is neat, and the clinic nameplate is clear」, 「The clinic has entirely medical facilities, such as beds, heat pack, infrared lamp, and transcutaneous electrical nerve stimulator」, 「Charge speed of making a reservation is quickly and receptionists have good service attitude」, 「Clinics protect patient data and privacy confidentiality」, 「The medical professional have groomed and well-dressed」, 「Clinic will

notice treatment time to patients」, 「Medical equipment, and medical professional arrangement have communication and coordination during the treatment process」, 「A doctor have the patients during the treatment process」, 「A doctor express concern and cure patients very quickly」, 「A doctor answer questions and doubts in detail」, 「A doctor chose right treatment strategies and position of the body」, 「A doctor explains how to take medicine in detail」, 「A doctor provide accurate treatment time and the number of acupuncture and moxibustion for patients」, 「A doctor has professional skills, abundant experiences, and great virtue」, 「Patients feel safe when doctors implement acupuncture and moxibustion treatment」, 「When patients complain, a doctor has to handle in the treatment process」 properly, 「A doctor has individual attention to the specific needs of patients during the treatment process」, 「During the treatment process, the medical professional, will attend to patient discomfort 『acupuncture and moxibustion produces discomfort』」, 「The medical professional has an excellent service attitude, courtesy, and care of patients」, 「End of treatment, the medical professional will be noticed again attention items and follow-up appointment to patients」, 「When patients receive medicine, the medical professional will remind number of taking medication, time of taking medication and food knowledge of TCM」, 「Patients feel good progress after treatment」,

「The Chinese material powder and soup have a good effect」.

### 3.3 Must-be Quality 「M」

None of the TCM clinic medical service quality elements were classified as must-be quality.

### 3.4 Indifferent Quality 「I」

None of the TCM clinic medical service quality elements were classified as indifferent quality.

## 4. CONCLUSION

The results of the above-mentioned analysis reveal that attractive quality is the primary reason patients choose TCM clinic treatment. Patients consider the element of medical service quality during treatment as whether nearby transportation is convenient. Conveniences such as being able to walk or ride a bike to reach the TCM clinic are viewed positively, as are MRT stations and bus stops outside or nearby the TCM clinic. Convenient parking for cars and motorcycles is another opportunity TCM clinics can implement for improvement.

Accordingly, the synthesis assessment analysis in the second part of Table 1 that looks at reasons why patients present to TCM clinics for treatment is consistent (close to home) and patient demographics indicate that relatively few patients traveled from other cities. Discomfort, stroke, physical handicap, and other factors require immediate treatment. Patients cannot endure difficult transfers and long traffic commutes across cities. Moreover, most patients expressed a preference for treatment that was close to home, for which nearby transportation was convenient. The clinic sampled in the study is located in Xinzhuang Dist. Center, New Taipei City, Taiwan (R.O.C.). Nearby transportation is convenient with bus stops, MRT, and the district office that provides free bus service. Bicycles, motorcycles, and scooters can be parked right outside the TCM clinic. There is also a parking tower, and the nearby car parks of Xinzhuang Sports Park. These are all patient satisfaction factors that can help TCM clinics improve service quality.

On the other hand, long waiting periods can be made less of a dissatisfaction if the clinic provides drinking water, books, newspapers, and television service. These conveniences help

waiting periods feel shorter. If the TCM clinic provides tea, water, books, newspapers, comics, and television, patients are willing to wait longer for treatment. This is another patient satisfaction factor that can help TCM clinics improve service quality and patient satisfaction.

These elements of quality service should be designed to exceed patient expectations and leave them with a feeling of satisfaction and special surprise. Conversely, when these elements of service quality are not met, patients will likely be disappointed and dissatisfied. If TCM clinics wish to attract more patients, the two elements of attractive quality described above need to support the medical services provided to reach future quality improvement goals.

The 23 sufficient service elements of TCM clinic service quality are critical to patient satisfaction. These service quality elements are positively correlated with patient satisfaction. When these elements of TCM clinic medical service quality are insufficient, it results in lower patient satisfaction. These factors are the primary reason that patients gave for choosing whether or not to continue treatment at the TCM clinic.

Finally, focusing on the 23 elements of medical service quality that are essential improving the quality of medical service and processes promotes patient follow up and continued care. As the second part in Table 2 indicates, reasons for clinic visits include:

- Familiarity - I have been here. It works for me. (14 people)
- Recommended by relatives and friends (12 people)
- Good service attitude (11 people)

Sufficient service element improvements at the TCM clinic may also promote a higher frequency of referral rate and recommendations to friends and family.

## CONSENT

As per international standard or university standard written patient consent has been collected and preserved by the authors.

## ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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