Patients' Satisfaction Analysis Based on the Quality of Medical Check Up Service: A Case Study of Zhanjiang Meinian Health Physical Examination Center[†]

Li Xu

College of Graduate Studies, Walailak University, Nakhon Si Thammarat 80160, Thailand

(Corresponding author's e-mail: xuliniu@126.com)

Abstract

Meinian Health Physical Examination Center is one of the most successful medical check-up service provider in Zhanjiang China. In order to evaluate the quality of service provided to patients, this study used the SERVEQUAL Instrument. The survey was conducted across all adult all patients who received medical check-up service in November 2022 in Meinian Health Physical Examination Centre in Zhanjiang City, Guangdong Province. The study determined population of 3,142 with 346 sample sizes. The data were collected by applying self-organized questionnaire which its items were developed using 5 scale on Likerts' measurement. The respondents were asked to value their expectation as well as their perception on 5 dimension of service quality i.e. tangible factor, reliability, responsiveness, assurance, and empathy. The study reveals that among all the 5 aspects of SERVEQUAL, assurance demonstrate the biggest gap between received and expected services, which is −1.11. Empathy, responsiveness, and reliability show the similar gap, which are −0.686, −0.654 and −0.642, respectively. Tangible shows the smallest gap of −0.599. It implies the strong need for the center to improve their service quality at urgent with a focus on the assurance aspect.

Keywords: Patients' satisfaction, Service quality, Meinian health physical examination center

Introduction

With the increase of people's living standards, people pay more and more attention to the early judgment of their own health conditions. The health concept of "early treatment and free prevention" has gradually become deeply rooted in their mind. The transformation from "sick seeking medical treatment" to "health management" has become an important thought in the world medical and health system in the 21st century. Monitoring, analyzing, evaluating, and intervening to prevent health risks are the process of health management. Health management is aimed at mobilizing the enthusiasm of individuals, groups, and society as a whole, and using resources efficiently to maximize health effects. In health management, individuals and groups are provided with targeted scientific health information and encouraged to take action to improve their health. There was a time when people predicted that competition between physical examination centers in the future would be similar to competition between health care management firms. As a result, Chinese health institutions have launched a series of "health-centered" check-up services to address people's needs.

It is one of the important goals of any health system to ensure patient satisfaction as one of the most important indicators of healthcare quality. Health systems' satisfaction and gauze responsiveness can be difficult to measure since not only clinical but also non-clinical outcomes of care influence customer satisfaction (Kaur et al., 2020). Health care managers in developing countries have largely ignored patients' satisfaction with health care systems. In order to reach a positive patient perception, many factors must be considered including: The quality of clinical services provided, the availability of medicine, the behavior of doctors and other health staff, the cost of services, the hospital infrastructure, the physical comfort of the patient, the emotional support of the patient, and the respect shown to their preferences. Insufficient satisfaction is related to a mismatch between patient expectations and the service provided. By assessing

---

[†]Presented at the Conference in Management: Winter 2022 (December 17, 2022 at Walailak University, Thailand)

patient perspectives, public health services can be made more responsive to people's needs and expectations (Kumar et al., 2010).

Patients' satisfaction with medical services has an important impact on the survival and development of the service providers, because only patients' satisfaction can make satisfied patients become loyal customers of the service providers, and then influence other patients through the reputation of these loyal customers to improve the service providers' image.

With the change of social and economic environment, people's consumption concept has become increasingly mature, more and more attention has been paid to personalized emotional consumption, and their participation in and evaluation of the service process has become more active and proactive. In addition, medical institutions are also facing increasingly fierce market competition. The competition in medical services will no longer be limited to quality and price. How to provide the best service and make it different from other competitors will become an important competitive factor. The effective way to achieve this goal is to carry out patients' satisfaction evaluation, effectively obtain patients' feedback on service information, and then optimize service quality.

Since the private medical check-up industry is highly competitive, Zhanjiang Meinian Health Physical Examination Center has been under increasing pressure to provide better services. The center faces major challenges despite its establishment in 2006 as other hospitals and institutions in the field are competing head-on with it. The center's services, management, facilities, and equipment face great challenges.

Objectives of the study

The research objectives of this study are to find out if there are gaps between patients' expectation and perception on the quality of medical check-up service of Meinian Health Physical Examination Center. Specifically, the research objectives are:

1) To explore the levels of patients' expectation and perception on the quality of medical check-up service of Meinian Health Physical Examination Center.

2) To compare expectation and perception on the quality of medical check-up service of Meinian Health Physical Examination Center.

Research framework and hypothesis

According to the research content, the main research framework is constructed as follow:
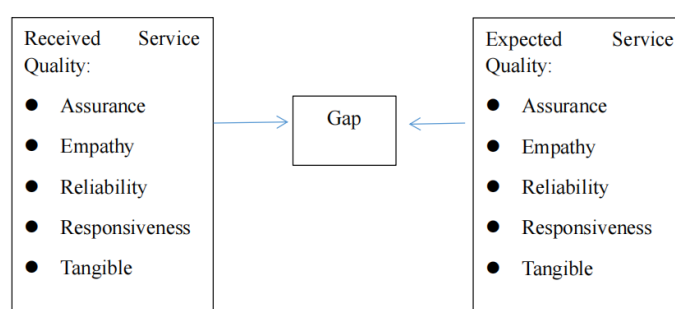
According to the setting of this research and the existing research results of some scholars, combined with the research direction and reality, the following hypothesis were prepared for the purpose of the research:

H1: There is a gap exist between patients' received and expected medical checkup service quality in Meinian Healthcare in Zhanjiang, China.

H1a: There is a gap exist between service quality-assurance.

H1b: There is a gap exist between service quality-empathy.

H1c:There is a gap exist between service quality-responsiveness.

H1d: There is a gap exist between service quality-reliability.

Literature review

As part of assessing the quality and delivery of healthcare, patients' satisfactions of care quality refer to how they see the services provided and the results of the treatment. However, patient experiences are based on what actually happens during the care process (Kim et al., 2020). According to Umaru & Bello (2020), perception on satisfaction refers to the process by which a consumer receives, selects, organizes, and interprets stimuli according to its own frame of reference, which includes attitudes, values, motivations, and previous experiences. There are 3 dimensions to perception of healthcare service quality: The physical environment (including its state, the social element, and tangible elements), the quality of the interaction (including attitudes and behaviors, diagnosis and quality of the medical process), and the quality of the results (including the wait times for reports and the accuracy of the results; Nugraha, 2020; Li, 2018).

The patient's satisfaction represents a positive appraisal of the achievement of his or her health care goals and expectations. Positive or negative expectations may be affected by prior levels of satisfaction, resulting in self-fulfilling expectations. Health-care outcome assessments include behavioral indices, including how the patients use medical services and adhere to treatment plans, as well as their subjective perceptions of satisfaction (Li, 2021).

As summarized by (Aburayya, 2020), patient satisfaction is influenced by both their own characteristics and the healthcare systems they are exposed to. Patient satisfaction has consistently been associated with consumers' perceptions of physicians' conduct and interactions with patients, as well as accessibility and availability of medical services based on his surveys of communities and large patient groups. He provided 2 main factors that influence patients' satisfaction in his study, which has provided a great reference for many subsequent studies. 1) Providing accessibility. Patients' perceptions of satisfaction with medical care are not consistent across general surveys of consumer opinions. The accessibility of medical care is affected by factors such as how long it takes a patient to get an appointment, how long they spend in the office waiting, and whether doctors are willing to make house calls and provide care at all hours. Several surveys have found that availability of health services affects patient satisfaction most strongly. In most surveys, accessibility predicts satisfaction significantly, but less than physician behavior. The willingness of patients to see their physicians again was significantly correlated with their perception that their physicians are easily accessible if needed. 2) Organizational variables. Several factors can influence a health-care provider's behavior, including his or her interpersonal behavior. There may be a correlation between patient perception and the provider's interpersonal behavior. Patients' satisfaction with the humaneness of their treatment was significantly positively correlated with organizational autonomy, interorganizational communication, and provider discretion. Patients' needs were more responsive and flexible when providers with greater role discretion handled their tasks and interacted with them. An agency's or office's environment and organizational characteristics have a significant impact on patient satisfaction, according to (Fatima et al., 2018).

Health services are extremely important to measure Service Quality, according to a study by (Asnawi et al., 2019; Al-Neyadi et al, 2016) examined patient satisfaction and health care quality in a similar study. The objective of this study is to analyze in detail patients' expectations regarding quality of care in rural government health facilities and their level of satisfaction with it. By identifying the determinants of patient satisfaction and the gap between patient expectations and perceptions, policy makers and decision makers can tailor programmes to patients' needs.

There has been an increase in patient involvement in hospital choice in recent years. Many patients choose their physicians indirectly, rather than directly choosing hospitals. A hospital's image is affected by patients' perceptions of its treatment (Fatima et al., 2018). Several factors are involved, including assessing the quality of the medical service, empathizing with the patient, understanding the problem and getting accurate information. To increase patient satisfaction, medical facilities should ensure they meet patients' health needs as well as meet their expectations, based on quality of care.

Qin (2019) argues that with the continuous deepening of medical reform, improved residents' health knowledge, and diversified needs of patients' medical services, patient satisfaction has been included in hospital evaluations of clinical technology and medical service quality. The national level for hospital service evaluation and survey of patient satisfaction is based on macro management demands. In the

application of survey data from a hospital internal management micro perspective, it is difficult to meet hospital internal management requirements, because macro patient satisfaction research cannot reflect hospital service details and personality traits. The evaluation of patient perception, establishing macro management needs, meeting micromanagement needs, and reducing survey costs and improving efficiency are all worth researching.

Patient satisfaction is affected by 8 major factors, according to (Qin, 2019). Public opinion and environmental factors. Based on the understanding of hospital public welfare, medical services as a general service, and patients' expectations and requirements of medical services, the social environment for public opinion has certain influence. Moreover, hospital management is not in place, leading to many disputes between doctors and patients. Today's media and networks have become instruments of tension between doctors and patients. The lack of mutual trust between doctors and patients contributes to medical order anomie, a factor that has a significant impact on patient satisfaction. As a result, public opinion should be guided rather than fueling the fire.

Institutional and policy factors. In public hospitals, the management system is not effectively divided from management and government affairs, and because the administrative management plays a leading role, patients also expect high levels of public welfare. Therefore, public hospitals play the main role in providing public welfare, which affects patients' evaluations of hospital satisfaction. To ensure that patients understand more about their healthcare, the hospital management system and policy factors should be highly valued.

The convenience factor of the medical treatment process. A smooth and convenient medical treatment process directly impacts a patient's medical energy costs, emotional costs, time costs, monetary costs. The patient's experience of medical treatment directly affects the patient's perception with the treatment. Consequently, how to improve the medical service process, by allowing patients to schedule appointments online, increasing medical consulting services, strengthening the visual design of the treatment process guide, letting patients know how to prepare for their visit, reducing confusion, alleviating the workload of medical staff and reducing patients' unnecessary problems. Patient perception will also be affected by logistics support services, such as medical guidance, fee settlement, drug collection, internet access, and department setting. Patients' needs are also different due to the different business of different departments, and their satisfaction is also different. Medical technology departments interact with clinical departments to ensure that the examination process and outcomes are timely, high-quality, and efficient.

Service attitude factors. Increasing the quality of medical care in China has included the attitude towards medical services. Good healthcare attitudes contribute to medical quality. As a result of this improvement in patient satisfaction, medical service attitudes differ from general attitudes towards medical services. It is not a "smiling, warm" service, but a human service based on doctors' benevolence. Mostly manifested in the doctor-patient communication aspect, as a result of information asymmetry between the doctor and the patient, there is no communication or communication between the doctor and the patient, or no consideration is given to communication skills, means, methods, etc. Patient and family expectations are not understood, and significant psychological changes occur during illness. Patient satisfaction is directly affected by both, even if dissatisfaction leads to disputes. Medical workers' mental and physical health is also affected by this social problem. Communication is the best way to smooth out a tense doctor-patient relationship.

The burden factor of medical treatment expenses. Patient satisfaction has been negatively impacted by "reasonable hospital medical expenses", according to survey data. Especially low-income groups are more sensitive to the cost of medical treatment, which directly affects patient satisfaction.

Medical ethics factors. The medical technical service price is so low that doctors cannot compensate for labor costs from medical charge revenue, so they examine patients excessively and treat them excessively, receive red envelopes and rebates on drug consumables, etc., as a result. As a result, patients' trust in medical staff is seriously damaged, resulting in a damage to the relationship between doctors and patients, affecting patient satisfaction as a consequence. To improve patient satisfaction, the "1-vote veto system" needs to be strengthened and implemented.

Personal factors. The level of patient satisfaction depends on factors such as patients' age, education level, occupation, medical insurance, monthly income, residence, residence and household registration, disease degree, diagnosis and treatment time by the doctor, waiting diagnosis and treatment time by the doctor, medical department, and hospital approach. Patient satisfaction can be affected by an older age, a higher education level, and a long waiting time.

Medical quality and safety factors. Biological, psychological, and social medicine has changed the connotation of a medical quality from a single clinical one to a clinical practice over time.

Verma et al. (2020) concluded that patients' satisfaction is pertinent to measuring the performance of health-care service delivery, which lead to a multidimensional construct that is dependent upon several factors. As an intermediate method for assessing health care quality, patients' satisfaction with their medical care can be evaluated. Patients need and expect services that match their needs and expectations in order to survive and succeed in today's competitive environment.

Health care is a highly competitive market. In order to deliver a high-quality service that meets customer expectations, it is essential to accurately identify customer needs and expectations. Health care expectations are generally shaped by patients' perceptions of ideal standards of care or by their past experiences using the service. It has been shown that meeting patients' expectations results in high levels of satisfaction with the related services, as a result of different studies that have been conducted. The same applies to their customers whose expectations are not met after they receive the services.

Methodology

Quantitative data will be collected using a questionnaire survey method. Questionnaire is a fast, efficient and low-cost method for large sample size information collection, as this study used questionnaire as a research tool. Because the variables and assumptions are clearly defined prior to data collection, quantitative study designs are often more appropriate for current studies to measure variables and correlations. The setting of the study was not artificially designed as the study was not influenced by any environmental factors or any manipulation. Respondents should voluntarily answer the questionnaire without manipulation. And the interference from the researchers.

Questionnaires were distributed and collected through the center's mobile Service Community on WeChat and by handing out paper questionnaires to patients when they attended medical checkup service in November 2022. Data analysis was done using SPSS 26.0 software. A paired sample is able to compare 2 population means available with 2 samples. Therefore, the Paired sample statistics and Paired sample test will be used in comparing the patients' "received" and "expected" scores and in analyzing such mean score in the different groups, and to determine if the gap exist between the 2.

Results and discussion

Respondent's profile

There were 346 questionnaires distributed to the patients in Meinian Healthcare Center in Zhanjiang, Guangdong Province in China. A total of 318 effective responses were collected, 116 male and 202 female. The effective response rate was 91.9 %. Among the respondents, 25.8 % of the respondents are 25 years or younger. The majority (49.1 %) are between 26 and 40 years old. 12.6 % of them are 41-6- years old. And there are 12.6 % of them are over 60 years old. Among the respondents, the majority (38.4 and 34.3 %) have secondary school degree and undergraduate degree respectively. And there are 1.9 % of them have graduate degrees or further.

Descriptive analysis

All mean values for received service quality in terms of Assurance are between 3.68 to 3.88, which means patients are in general slightly positive towards the Assurance. Among all the received items, Item 5 (Employees in the Meinian Center are always polite with you.) had the lowest mean value 3.71 with standard deviation of 1.068. Items 7 (Employees in the Meinian Center have the information to reply to your questions) had the highest mean value 3.88 with standard deviation of 0.813. It is clear that all the

means values for expected Assurance are between 4.13 and 5.61. The highest mean score 5.61 is from Item 5 (You experience secure in your dealings with the Meinian Center) with standard deviation of 0.710.

Table 1 Descriptive analysis of service quality.

		Mean	S.D.
The performance of employees in the Meinian Center instills self-assurance in you.	Received	3.68	0.962
	Expected	5.58	0.723
Employees in the Meinian Center are always polite with you.	Received	3.71	1.068
	Expected	5.61	0.710
You experience secure in your dealings with the Meinian Center	Received	3.82	0.783
	Expected	4.13	1.301
Employees in the Meinian Center have the information to reply to your questions.	Received	3.88	0.813
	Expected	4.21	1.207

It is clear that all the means values for expected Empathy are between 4.43 and 5.58. The highest mean score 5.58 is from Item 9 (The Meinian Center has in service hours convenient to all their patients.) with standard deviation of 1.217.

All mean values for received service quality in terms of Empathy are between 3.81 to 3.90, which means patients are in general slightly positive towards the Empathy. Among all the received items, Item 11 (The Meinian Center has their patients best interest at heart) had the lowest mean value 3.71 with standard deviation of 0.864. Items 9 (The Meinian Center has in service hours convenient to all their patients) had the highest mean value 3.90 with standard deviation of 0.857.

Table 2 descriptive analysis of empathy.

		Mean	S.D.
The Meinian Center gives patients individual attention.	Received	3.87	0.862
	Expected	4.57	1.238
The Meinian Center has in service hours convenient to all their patients.	Received	3.90	0.857
	Expected	4.58	1.217
The Meinian Center has employees who provide patients individual service.	Received	3.89	0.848
	Expected	4.57	1.207
The Meinian Center has their patients best interest at heart.	Received	3.87	0.864
	Expected	4.57	1.197
The employees of Meinian Center recognize the specific needs of their patients.	Received	3.81	0.982
	Expected	4.43	1.086

It is clear that all the means values for expected Reliability are between 4.22 and 4.82. The highest mean score 4.82 is from Item 14 (When a consumer has an issue, the Meinian Center demonstrate a genuine interest in solving it) with standard deviation of 1.086.

All mean values for received service quality in terms of Reliability are between 3.86 to 4, which means patients are in general slightly positive towards the Reliability. Among all the received items, Item 13 (When the Meinian Center assure to do great by a certain time, they do) had the lowest mean value 3.86 with standard deviation of 0.881. Items 17 (The Meinian Center persist on error free records) had the highest mean value 4 with standard deviation of 1.011.

Table 3 Descriptive analysis of reliability.

		Mean	S.D.
When the Meinian Center assure to do great by a certain time, they do.	Received	3.86	0.881
	Expected	4.57	1.197
When a consumer has an issue, the Meinian Center demonstrate a genuine interest in solving it.	Received	3.91	0.936
	Expected	4.82	1.086
The Meinian Center execute the service true during the first instance.	Received	3.95	0.972
	Expected	4.70	1.016
The Meinian Center execute the service at the time they assure to do so.	Received	3.96	0.858
	Expected	4.22	1.127
The Meinian Center persist on error free records	Received	4.00	1.011
	Expected	4.58	1.169

It is clear that all the means values for expected Responsiveness are between 4.38 and 4.66. The highest mean score 4.66 is from Item 19 (Employees of the center provide timely service to patients) with standard deviation of 1.139.

All mean values for received service quality in terms of Responsiveness are between 3.81 to 3.98, which means patients are in general slightly positive towards the Responsiveness. Among all the received items, Item 20 (Employees of the center consistently be willing to facilitate patients) had the lowest mean value 3.81 with standard deviation of 0.941. Items 21 (Employees of the center never be too busy to react to patients requests) had the highest mean value 3.98 with standard deviation of 0.866.

Table 4 Descriptive analysis of responsiveness.

		Mean	S.D.
Employees of the center tell patients exactly when services will be executed.	Received	3.88	0.865
	Expected	4.55	1.138
Employees of the center provide timely service to patients.	Received	3.88	0.915
	Expected	4.66	1.139
Employees of the center consistently be willing to facilitate patients.	Received	3.81	0.941
	Expected	4.38	1.028
Employees of the center never be too busy to react to patients requests.	Received	3.98	0.866
	Expected	4.58	1.153

It is clear that all the means values for expected Tangible are between 4.41 and 4.68. The highest mean score 4.68 is from Item 24 (The physical facilities at the Meinian Center are visually appealing) with standard deviation of 1.085.

All mean values for received service quality in terms of Tangible are between 3.87 to 4.01, which means patients are in general slightly positive towards the Tangible. Among all the received items, Item 25 (The Meinian Center has modern looking equipment) had the lowest mean value 3.87 with standard deviation of 1.018. Items 24 (The physical facilities at the Meinian Center are visually appealing) had the highest mean value 4.01 with standard deviation of 1.036.

Table 5 Descriptive analysis of tangible.

		Mean	S.D.
22 Materials related with the service (brochures or reports) are visually pleasing at the Meinian Center.	Received	3.95	0.904
	Expected	4.58	1.142
23 Employees at the Meinian Center are smart in their appearance.	Received	3.89	0.899
	Expected	4.41	1.136
24 The physical facilities at the Meinian Center are visually appealing.	Received	4.01	1.036
	Expected	4.68	1.085
25 The Meinian Center has modern looking equipment.	Received	3.87	1.018
	Expected	4.45	1.052

Comparison the gap between received and expected service quality

The result showed that there is (-1.110) gaps exist between the received and expected service quality in terms of Assurance in Meinian Healthcare Center. The expected mean scores of all items of service quality- Assurance are greater than the received mean scores which indicate that a gap exists in the respect of service quality- Assurance. In the respect of items representing empathy, the highest value for the gap is from Item 5 (Employees in the Meinian Center are always polite with you) and Item 4 (The performance of employees in the Meinian Center instills self-assurance in you) which are both -1.899. The results indicated that the patients expectation towards the performance of employees and their experience with the center, while their actual experiences did not match with that.

The significance value is (0.000) which is less than 0.05 at 95 % level of significance so that null hypothesis is rejected. It can be concluded that there is gap exist between received and expected medical checkup service quality in terms of Assurance in Meinian Healthcare Centre.

Table 6 Gap and paired samples statistics between received and expected of assurance.

Assurance	Received mean	Expected mean	Gap = Received mean-expected mean
The performance of employees in the Meinian Center instills self-assurance in you.	3.68	5.58	-1.899
Employees in the Meinian Center are always polite with you.	3.71	5.61	-1.899
You experience secure in your dealings with the Meinian Center.	3.82	4.13	-0.308
Employees in the Meinian Center have the information to reply to your questions.	3.88	4.21	-0.333
Total SERVQUAL- assurance gap	3.77	4.88	-1.110

Paired differences								
	Mean	S.D.	Std. error mean	95 % confidence interval of the difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Received assurance - Expected assurance	-1.11006	0.89186	0.05001	-1.20846	-1.01166	-22.195	317	0.000

The result showed that there is (-0.686) gaps exist between the received and expected service quality in terms of Empathy in Meinian Healthcare Center. The expected mean scores of all items of service quality-EMPATHY are greater than the received mean scores which indicate that a gap exists in the respect of service quality-empathy. In the respect of items representing empathy, the highest value for the gap is from Item 11 (The Meinian Center has their patients best interest at heart) which is -0.748. The results

indicated that the patients expectation towards the caring and interests form the center, and their actual experiences did not match very well.

The significance value is (0.000) which is less than 0.05 at 95 % level of significance so that null hypothesis is rejected. It can be concluded that there is gap exist between received and expected medical checkup service quality in terms of Empathy in Meinian Healthcare Centre.

Table 7 Gap and paired samples statistics between received and expected of empathy.

Assurance	Received mean	Expected mean	Gap = Received mean-expected mean
The Meinian Center gives patients individual attention.	3.87	4.57	−0.695
The Meinian Center has in service hours convenient to all their patients.	3.9	4.58	−0.679
The Meinian Center has employees who provide patients individual service.	3.89	4.57	−0.679
The Meinian Center has their patients best interest at heart.	3.87	4.57	−0.748
The employees of the Meinian Center recognize the specific needs of their patients.	3.81	4.43	−0.629
Total SERVQUAL- empathy gap	3.866	4.552	−0.686

Paired differences								
	Mean	S.D.	Std. Error mean	95 % Confidence interval of the difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Received empathy - Expected empathy	−0.6862	1.1808	0.0662	−0.8164	−0.5559	−10.362	317	0.000

The result showed that there is (−0.642) gaps exist between the received and expected service quality in terms of Reliability in Meinian Healthcare Center. The expected mean scores of all items of service quality-Reliability are greater than the received mean scores which indicate that a gap exists in the respect of service quality. In the respect of items representing Reliability, the highest value for the gap is from Item 14 (When a consumer has an issue, the Meinian Center demonstrate a genuine interest in solving it) which is −0.912. The results indicated that the patients' expectation towards the center's attitude toward solving issues and problems and their actual experiences did not match very well.

The significance value is (0.000) which is less than 0.05 at 95 % level of significance so that null hypothesis is rejected. It can be concluded that there is gap exist between received and expected medical checkup service quality in terms of Reliability in Meinian Healthcare Centre.

Table 8 Gap and paired samples statistics between received and expected of reliability.

Assurance	Received mean	Expected mean	Gap = Received mean-expected mean
When the Meinian Center assure to do great by a certain time, they do.	3.86	4.57	−0.704
When a consumer has an issue, the Meinian Center demonstrate a genuine interest in solving it.	3.19	4.82	−0.912
The Meinian Center execute the service true during the first instance.	3.95	4.70	−0.748
The Meinian Center execute the service at the time they assure to do so.	3.96	4.22	−0.264
The Meinian Center persist on error free records.	4.00	4.58	−0.579
Total SERVQUAL- empathy gap	3.936	4.577	−0.642

			Paired differences					
	Mean	**S.D.**	**Std. Error mean**	**95 % Confidence interval of the difference**		**t**	**df**	**Sig. (2-tailed)**
				Lower	**Upper**			
Received empathy - Expected empathy	−0.6415	0.8334	0.0467	−0.7335	−0.5496	−13.727	317	0.000

The result showed there is (−0.654) gaps exist between the received and expected service quality in terms of Responsiveness in Meinian Healthcare Center. The expected mean scores of all items of service quality-Responsiveness are greater than the received mean scores which indicate that a gap exists in the respect of service quality-Responsiveness. In the respect of items representing Responsiveness, the highest value for the gap is from Item 19 (Employees of the center provide timely service to patients) which is -0.780. The results indicated that the patients expectation towards the timely service form the center and their actual experiences did not match very well.

The significance value is (0.000) which is less than 0.05 at 95 % level of significance so that null hypothesis is rejected. It can be concluded that there is gap exist between received and expected medical checkup service quality in terms of Responsiveness in Meinian Healthcare Centre.

Table 9 Gap and paired samples statistics between received and expected of responsiveness.

Assurance	Received mean	Expected mean	Gap = Received mean-expected mean
Employees of the center tell patients exactly when services will be executed.	3.88	4.55	−0.673
Employees of the center provide timely service to patients.	3.88	4.66	−0.780
Employees of the center consistently be willing to facilitate patients.	3.81	4.38	−0.566
Employees of the center never be too busy to react to patients requests.	3.98	4.58	−0.597
Total SERVQUAL- empathy gap	3.888	4.543	−0.645

			Paired differences					
	Mean	**S.D.**	**Std. Error mean**	**95 % Confidence interval of the difference**		**t**	**df**	**Sig. (2-tailed)**
				Lower	**Upper**			
Received empathy - Expected empathy	−0.65409	1.01635	0.05699	−0.76622	−0.54195	−11.476	317	0.000

The result showed there is (−0.599) gaps exist between the received and expected service quality in terms of Tangible in Meinian Healthcare Center. The expected mean scores of all items of service quality-Tangible are greater than the received mean scores which indicate that a gap exists in the respect of service quality. In the respect of items representing Tangible, the highest value for the gap is from Item 20 (Employees of the center consistently be willing to facilitate patients) which is −0.667. The results indicated that the patients' expectation towards the willingness of facilitate and help from the center and their actual experiences did not match very well.

The significance value is (0.000) which is less than 0.05 at 95 % level of significance so that null hypothesis is rejected. It can be concluded that there is gap exist between received and expected medical checkup service quality in terms of Tangible in Meinian Healthcare Centre.

Table 10 Gap and paired samples statistics between received and expected of tangible.

Assurance	Received mean	Expected mean	Gap = Received mean-expected mean
Employees of the center tell patients exactly when services will be executed.	3.95	4.58	−0.629
Employees of the center provide timely service to patients.	3.89	4.41	−0.522
Employees of the center consistently be willing to facilitate patients.	4.01	4.68	−0.667
Employees of the center never be too busy to react to patients requests.	3.87	4.45	−0.597
Total SERVQUAL- empathy gap	4.929	4.528	−0.599

	Paired differences							
	Mean	**S.D.**	**Std. Error mean**	**95 % Confidence interval of the difference**		**t**	**df**	**Sig. (2-tailed)**
				Lower	**Upper**			
Received empathy - Expected empathy	−0.59906	0.98009	0.05496	−0.70719	−0.49092	−10.900	317	0.000

To sum up, among all the 5 aspects of SERVQUAL, assurance demonstrate the biggest gap between received and expected services, which is −1.11. Empathy, responsiveness, and reliability show the similar gap, which are −0.686, −0.654 and −0.642 respectively. Tangible shows the smallest gap of −0.599. It implies the strong need for the center to improve their service quality at urgent with a focus on the assurance aspect.

Conclusions

In general, the responses were slightly positive towards items related to received service. With the assistance of paired sample tests, gaps between patients' received and expected service quality are detected from all aspects of service quality measured by SERVEQUAL. It can be concluded that there is a gap exist between patients' received and expected medical checkup service quality in Meinian Healthcare in Zhanjiang, China. Therefore, the research hypothesis is accepted.

Among all 5 expected aspects of SERVEQUAL, the assurance had the highest overall mean values, with reliability rank the second, and the third is for empathy, and the responsiveness and the tangible received the overall lowest mean values. Among them, people have very high expectation towards the politeness of the employees of the center, and they expected relatively less in the overall experience to be securing.

While for their received service, reliability received the best score, followed by tangible, responsiveness and empathy which have very similar performance. The assurance received the lowest score. Among all the items, the center's willingness to facilitate the patients whenever there is an issue received the best score, it means the center is showing a good attitude in helping and assisting their patients. However, the employees are not showing enough assuring quality in from of patients, which show the needs of improvement in the future. Based on above findings recommendations are provided for Meinian Healthcare Center and other healthcare institutions in China. It is very important for employees to perform professionally regarding how they make patients feel about their work, thus giving assurance to show the appreciation and respect. In this case, patients will feel more secured when being served. It is also necessary for centers and employees to pay attention to the communication quality by improving employees' expression to be politely and properly. Simple words and good attitude are much preferred by people. Besides, the center should encourage more creativity and willingness in assisting patients in need, which will greatly improve patients' medical checkup experience in the center.

This study was conducted only with people in a certain area of China, which did not fully reflect the majority of the cases in China. Therefore, the analysis of the study results is limited. The findings of the

study must be used with caution. Besides, respondents are designed as random, which lead to the fact that the responses are quite subjective. Therefore, the results may not truly reflect the state of both variables.

Recommendations

Based on above findings recommendations are provided for Meinian Healthcare Center and other healthcare institutions in China. It is very important for employees to perform professionally regarding how they make patients feel about their work, thus giving assurance to show the appreciation and respect. In this case, patients will feel more secured when being served.

Besides, the center should encourage more creativity and willingness in assisting patients in need, which will greatly improve patients' medical checkup experience in the center. The specific recommendations for Zhanjiang Meinian Healthcare Center are stated as follow.

Moreover, in the Internet era, there is no reason not to contact and interact with your patients. About 40 % of professionals agree that using digital channels to contact and communicate with patients will improve the treatment effect of patients.

It is also necessary for centers and employees to pay attention to the communication quality by improving employees' expression to be politely and properly. Simple words and good attitude are much preferred by people.

Patients are often annoyed that they cannot communicate with their provider between appointments. You can use technology and build systems to open communication channels between doctors and patients. This will not only promote long-term patient relationships, but also create better clinical outcomes by making it easier for patients to schedule appointments.

There is nothing more frustrating than coming to an appointment on time and waiting in the waiting room for about 30 min before your turn. Most patients will turn to the doctor within a short waiting time.

Providing patients with the necessary information is critical to achieving a positive patients' experience. Moreover, research also shows that greater patient empowerment will lead to better patient compliance, thereby improving patient satisfaction and clinical outcomes.

References

Aburayya, A. (2020). An Investigation of the effect of lean six sigma practices on healthcare service quality and patient satisfaction: testing the mediating role of service quality in dubai primary healthcare sector. *Journal of Advanced Research in Dynamical and Control Systems, 12*(SP8), 56-72.

Al-Neyadi, H. S., Abdallah, S., & Malik, M. (2016). Measuring patient's satisfaction of healthcare services in the UAE hospitals: Using Servqual. *International Journal of Healthcare Management, 11*(2), 96-105.

Asnawi, A. A., Awang, Z., Afthanorhan, A., Mohamad, M., & Karim, F. (2019). The influence of hospital image and service quality on patients' satisfaction and loyalty. *Management Science Letters, 9*(6), 911-920.

Davoud, K. Z. (2017). Client perception on quality improvement in health care services and patient satisfaction. *Public Health Open Access, 1*(2), 000111.

Fatima, T., Malik, S. A., & Shabbir, A. (2018). Hospital healthcare service quality, patient satisfaction and loyalty. *International Journal of Quality & Reliability Management, 35*(6), 1195-1214.

Huajin. (2021). *Analysis of the development status and prospect trend of the physical examination industry in 2021*. Retrieved from https://zhuanlan.zhihu.com/p/396512876

Kaur, M., Bashar, A., Singh, T., & Kumar, R. (2020). Cross-sectional study of clients' satisfaction with outpatient and inpatient services of public health facilities of a North Indian State. *Health Services Insights, 13*, 1-8.

Kim, M. G., Lee, N. E., & Sohn, H. S. (2020). Gap between patient expectation and perception during pharmacist-patient communication at community pharmacy. *International Journal of Clinical Pharmacy, 42*(2), 677-684.

Kohl, S. (2018). OECD-delivering quality health services: A global imperative. *European Journal of Hospital Pharmacy, 25*(5), 286-288.

Kumar, R., Srivastava, J., Sharma, L., & Sodani, P. (2010). Measuring patient satisfaction: A case study to improve quality of care at public health facilities. *Indian Journal of Community Medicine, 35*(1), 52-56.

Li, L. (2021). *Research on the problems existing in the current hospital physical examination center and the solution countermeasures*. Retrieved from http://www.100md.com/html/paper/1008-1879/2012/09/255.htm

Lin, D. J., Sheu, I. C., & Pai, J. Y. (2009). Measuring patient's expectation and the perception of quality in LASIK services. *British Journal of Healthcare Management, 21*(2), 92-97.

Lu, Q. (2015). *Main problems and improvement measures in medical examinations*. Retrieved from https://www.docin.com/p-1213959484.html

Nugraha, K. S. W. (2020). Healthcare service quality: Building patient satisfaction and word-of-mouth in the private hospital in Indonesia. *Journal of Advanced Research in Dynamical and Control Systems, 12*(1), 130-136.

Qadri, U. A. (2015). Measuring service quality expectation and perception using SERVQUAL: A gap analysis. *Business and Economics Journal, 06*(03), 1000162.

Qin, Y. (2019). *"Eight factors" affecting patient satisfaction in health community*. Retrieved from https://www.cn-healthcare.com/articlewm/20190211/content-1045738.html

Rawal, D. M. (2019). Study of jaundice profile in patients admitted in tertiary care hospital of rural Haryana. *Journal of Medical Science and Clinical Research, 7*(11), 860-866.

Rosińczuk, J., Manulik, S., & Karniej, P. (2016). Evaluation of health care service quality in Poland with the use of SERVQUAL method at the specialist ambulatory health care center. *Patient Preference and Adherence, 10*, 1435-1442.

Suciptawati, N. L. P., Paramita, N. L. P. S. P., & Aristayasa, I. P. (2019). Customer satisfaction analysis based on service quality: Case of local credit provider in Bali. *Journal of Physics: Conference Series, 1321*, 022055.

Umaru, J. A., & Bello, K. B. (2020). Perceived quality of healthcare services and patients satisfaction in federal medical centre yola, North-East Nigeria. *The International Journal of Business & Management, 8*(6), 367-379.

Verma, M., Rana, K., Kankaria, A., & Aggarwal, R. (2020). Assessment of patient's satisfaction visiting a tertiary health care institute in north India. *Journal of Pharmacy and Bioallied Sciences, 12*(3), 252-261.

Zarei, A., Arab, M., Froushani, A. R., Rashidian, A., & Ghazi Tabatabaei, S. M. (2012). Service quality of private hospitals: The Iranian Patients' perspective. *BMC Health Services Research, 12*(1), 31.