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Evaluation Model of Community Home Medical Care Service Quality in "Internet Plus" Era

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Abstract: The research on the connotation, components, evaluation indexes, models and methods of the service quality of medical and nursing institutions for the elderly has not been reported in the literature. Based on the theory of customer perceived service quality and Servqual model, this paper constructs an evaluation index system of service quality of medical and nursing combined pension institutions, establishes a structural equation model of each dimension of service quality, service affordability and overall satisfaction of the elderly, and explores the potential relationship between each dimension and service quality, service affordability and overall satisfaction of the elderly, which can provide new perspectives and ideas for service quality evaluation of medical and nursing combined pension institutions, and has strong research significance and value.

Keywords: Internet plus; Community residence; Medical and nursing services; Assessment of service

1. Introduction

In today's era, social problems caused by the over-aging of the population emerge one after another. The problems of subsistence allowances and the loss of various living abilities faced by the elderly population are becoming more and more severe [1]. According to the latest national forecast, China's elderly population will exceed 250 million in 2020. Among them, the absolute elderly population accounts for 30.7 million and the loss of basic abilities is as high as 48 million. Therefore, the need to maintain the daily medical care of the elderly and the disabled needs to be urgently solved. In 2013, the new national policy proposed that all localities should strictly develop integrated medical care institutions [2]. The latest data also show that by 2018, there will be a total of 30,000 old-age medical institutions nationwide, of which integrated care institutions account for 19.67% and a total of 5,700. Due to the rapid development of medical and nursing institutions in various places, the service attitude and quality problems of institutions have emerged and become the focus of social attention [3]. However, how to objectively evaluate the service problems of integrated medical and nursing institutions is a realistic and challenging topic. At present, there are few research topics on the service quality of medical care institutions for the aged, and the research results at home and abroad are not outstanding. In order to solve this problem, based on the

evaluation of medical maintenance service problems, this paper initially constructs an evaluation model, which includes five aspects: medical service equipment, organization operation status, safety and security facilities, warmth of humanistic care and health examination management [4]. In selecting the evaluation system, it boldly draws lessons from Gronroos system and SERVQUAL system, and proposes to combine medical maintenance with integrated system for research. During this period, factor analysis and validity analysis are applied to analyze the reasons that affect the evaluation results.

2. Community Home Medical Care Service Quality Evaluation Model

2.1. Community home medical care service quality indicators

The main service contents of the medical maintenance integrated service institution cover the four main bodies of maintenance service, living arrangement, humanistic care and recreational activities [5]. This research initially boldly draws lessons from SERVQUAL system, and uses the five major latitudes of SERVQUAL system, i.e. reliability, supportability, responsiveness, physique and empathy, to evaluate the integrated medical care institutions.

Table 1. Service quality evaluation system of integrated medical care service institutions

Dimensions	Maintenance services	Living arrangements	Humanistic care	Recreational activities
Reliability	The content of nursing	Living facilities are	Rich spiritual comfort	Diversified development

	service is complete.	comprehensive.		of entertainment arrangements
Security	Health care workers deserve trust.	Living facilities are comprehensive.	Sufficient nursing staff	Organizing recreational activities is very active.
Responsiveness	The rescue arrangement was very timely.	Timely solve the customer's life needs	Professional Psychological Counseling	Entertainment arrangements are available at all times.
Physique	Medical and nursing equipment is complete.	Living facilities are complete	Humanistic care facilities are complete	Entertainment facilities are perfect.
Empathy	Formulate medical care plans at different levels.	Help with dining and other services	Arrange Hospice Services Properly	Entertainment and leisure arrangements

The quality of service is reflected by the difference between the expected value and the inner perception value, and the service quality of the organization is directly measured by the human perception degree. Then he proves the correctness of this view. Therefore, in the end, we directly observe the perception degree of the elderly in the medical care institutions on the service quality and arrange them to carry out a scoring system. As shown in

the following figure, the surveyed elderly people's method scores the perception of the four services in the medical care institutions from five directions. From the top to the bottom, the grades are very satisfactory, satisfactory, general, unsatisfactory and very unsatisfactory. The collected results are counted and factor analysis is used to study the reasons that affect the service quality evaluation results of the institutions.

Table 2. Satisfaction scores on service quality of integrated medical care institutions

Service content	Evaluation index	Satisfaction score/point	Factor load value
Maintenance services	-	3.05	
	The content of nursing service is complete.	3.18	0.687
	Health care workers deserve trust.	3.3	0.631
	The rescue arrangement was very timely.	3.1	0.617
	Medical and nursing equipment is complete.	2.92	0.735
	Formulate medical care plans at different levels.	2.76	0.797
Living arrangements	-	3.37	-
	Living facilities are comprehensive.	3.63	0.445
	The service personnel were very patient.	3.80	0.425
	Timely solve the customer's life needs	3.45	0.460
	Living facilities are complete	2.8	0.588
	Help with dining and other services	3.21	0.523
Humanistic care	-	2.97	-
	Rich spiritual comfort	3.05	0.534
	Sufficient nursing staff	3.16	0.587
	Professional Psychological Counseling	3.35	0.512
	Humanistic care facilities are complete	2.78	0.706
	Arrange Hospice Services Properly	2.67	0.658
Recreational activities	-	3.16	0.642
	Diversified development of entertainment arrangements	3.50	0.548
	Organizing recreational activities is very active.	3.05	0.684
	Entertainment arrangements are available at all times.	3.57	0.588
	Entertainment facilities are perfect.	2.99	0.549
	Entertainment and leisure arrangements	2.72	0.506
Overall assessment	-	3.18	-

In medical service, the load value of empathy mountain factor in "graded diagnosis and treatment and nursing plan" is 0.798, which has become the primary factor affecting the quality of medical service [6]. This is because the elderly people living in medical and nursing care institutions are generally in poor physical condition, so they pay more attention to the quality of graded diagnosis and care services. Secondly, the "medical personnel provide timely assistance" response mountain factor load value of 0.734 shows that the elderly attach great importance to timely medical treatment, because timely medical treatment can reflect the emergency capability of the

medical service of the institution and effectively solve the medical treatment problem of the elderly in the first place [7]. The third place is "perfect medical facilities" with a physical mountain factor load value of 0.680, which indicates that perfect medical facilities are also an important factor affecting the quality of medical services and can improve the elderly's trust in pension institutions. The "comprehensive medical service" reliable mountain factor load value is 0.627 and the "medical and nursing personnel trustworthy" (assurance) factor load value is 0.618, which directly affects the elderly's perception of the service quality of pension institutions.

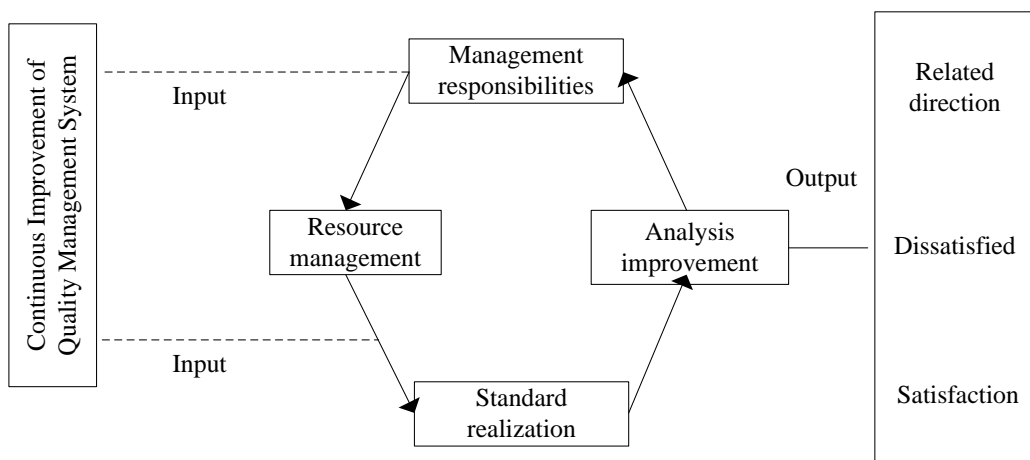


Figure 1. Community home medical welfare service system

In the life care service, "solve the life problems of the elderly in time" (the response mountain factor load value is 0.599, which is the strongest influence factor. The second is food and bath assistance service (empathy mountain factor load value is 0.513 [8]. The factors of carefulness (reliability) in daily living care, perfection (tangibility) of living facilities, dietary taste, nutrition and indoor cleanliness (assurance) of service personnel are all below 0.5, which has a weak impact on the quality of life care service for the elderly.

2.2. Weight coefficient of community home medical service quality assessment data

This study invited 25 experts from home and abroad in the field of geriatric medical and nursing services, who came from various universities, medical and nursing institutions, social pension service institutions, civil affairs service departments and so on [9]. After studying, they understood PZB's five directions and 22 index dimensions based on in-depth observation and jointly discussed the service quality evaluation system and the establishment of evaluation index model for the current elderly medical care institutions [10]. They adopted the method of discussion meeting and finally jointly determined the five directions and 20 index dimensions of the service quality evaluation model for the elderly medical care institutions. As shown in the following table.

Table 3. Revisions to pzb system and construction of long-term medical service quality evaluation model for the elderly

PZB Model of Inner Perceived Service Quality for the Elderly			Evaluation Model of Elderly People's Quality of Long-term Medical Service		
Direction	Positive indicator	Indicator model	Direction	Positive indicator	Indicator model
Physique	Positive indicator	A1 service facilities are complete.	Physique	Positive indicator	B1 Service Equipment Intelligence
		A2 service equipment is attractive			B 2 suitable service equipment
		A3 service personnel shall wear neat and clean clothes.			B 3 uniform standard for service personnel
		A4 company has perfect facilities.			B 4 perfect service system

Security	Positive indicator	A5 institutions are highly committed	Security	Positive indicator	B 5 perfect management system
		A6 Organizations Encountered Difficulties Willing to Help			B 6 sufficient number of employees
		A7 mechanism has high reliability.			B 7 staff dress integration
		A8 Record Relevant Indicators Correctly			B 8 rich services
Responsiveness	Reverse index	A9 Service Staff Have Poor Reception Attitude	Responsiveness	Reverse index	B 9 Timely Response to Elderly Service Needs
		A10 service personnel cannot provide services.			B 10 emergency handling properly
		A11 staff are not willing to help others.			B 11 employee benefits are good.
		A12 Agency Fails to Fulfill Promise			B 12 accurate service hours
Reliability	Reverse index	A13 Service Personnel Worth Trusting	Reliability	Reverse index	B 13 clients are getting better and better.
		A14 Service Staff Has Good Attitude			B 14 customer satisfaction with service content
		A15 Good Feedback from Elderly			B 15 employees are motivated
		A16 Agency's Service Gradually Improved			B 16 customer value improved
Empathy	Reverse index	A17 cannot serve customers by type.	Empathy	Reverse index	B 17 adjust service content according to customer type
		A18 organization does not understand the needs of employees.			B 18 service personnel have patience.
		A19 Agency Can't Think for Customers			B 19 enthusiasm of service personnel
		A20 service content cannot satisfy the public			B 20 Humanistic Spirit Comfort Timely

Among them, we need to classify different levels and then compare the importance of index data at the same level. Using the judgment matrix, the index number has N corresponding indexes of the same level

{x1,xZ,x3,...xn}, while the comparison of the importance of indexes at the parent level can be directly reflected by the 1-9 value method, as shown in the following table.

Table 4. Comparison of importance of indicators at the same level 1-9 numerical calculation indicators

Indicators	Meaning
1	The comparison of two factors in the same level has the same degree of importance.
3	Compared with the two factors in the same level, the former is slightly more important.
5	Compared with the two factors in the same level, the former is significantly more important.
7	Compared with the two factors in the same level, the former is more important and stronger.
9	Compared with the two factors in the same level, the former is extremely more important.
2、4、6、8	Intermediate value between 1-3, 3-5, 5-7, 7-9

2.3. Implementation of quality assessment of community home medical care services

Further establish a target system centered on "elderly people's assessment of the service content and quality of health care institutions". Then, we will apply parent-level data to the above-mentioned five directional attributes of physique, supportability, responsiveness, effectiveness and empathy, and use the data under the five attributes as sub-level data to construct six judgment matrices. At the same time, authoritative experts at home and abroad are invited to evaluate and score the sub-layer data in the

judgment matrix in comparison with their own importance. Here, communication between experts is prohibited to avoid the influence of experts' subjective judgment. Finally, the evaluation results are input to YAAHP to obtain the weight coefficients of the sub-layer data. With the same operation, we can also obtain various weight coefficients of the parent index. Then the expert scoring results are summarized to calculate the average value of the weight coefficients and the final results of the five direction attributes. The following is the weight scoring of each attribute coefficient sub-layer index on the parent layer index, so that the consistency check value obtained for each direction attribute and the check

value of the whole judgment matrix are not more than 0.1. Therefore, on the whole, the attributes of all directions and the scoring of all data meet the requirements of con-

sistency and have passed the verification successfully, as shown in the following table

Table 5. Consistency check data tables for 5 directions and entire matrix

	Guarantee	Responsiveness	Validity	Empathy	Matrix
CI value	0.0151	0.045	0.0540	0.4401	0.2101
CR value	0.0008	0.006	0.0350	0.0206	0.0060

From the above table, the elderly cannot evaluate the service content and quality of medical and nursing institutions without comparing the expected service quality of the elderly with their actual inner feelings. Many factors affect the fluctuation of the inner feelings of the elderly, such as the back-office technology of the institutions, the function of service equipment, and the internal system and culture of the institutions. Admittedly, the existing model also has many defects, such as not fully considering the impact of price on the inner feelings of the elderly, ignoring the definition of the existing system variable attributes, which all affect the use of the model. The measurement of service quality for the aged based on the above table depends on the comparison between the service level expected by customers and the service level actually felt. The factors that affect the customer perceived service quality include technical quality, functional quality and corporate image. However, the model also has some deficiencies, such as ignoring the impact of price and other factors on the customer perceived service quality, and not defining the variables involved in the model, which makes the application of the model greatly limited. Perceived service quality has been studied more extensively and deeply, the famous "service quality gap model theory" has been put forward, and Servqual model has been established to measure service quality from 5 dimensions of tangibility, reliability, responsiveness, assurance and empathy and 22 specific indicators.

Servqual model is completely based on customer perception, and is used as the basis to judge the service quality level according to the difference between the perception and expectation of each department. Later PZB revised the model several times, adding weight to the revised servqual model, thus simplifying the scale and making it a classic method in service quality evaluation. According to the analysis results, among the three attributes mentioned in the evaluation criteria layer, the highest score is "living arrangements" followed by "maintenance services" and the lowest score is "humanistic care". The specific testing and analysis results are as follows:

First of all, the elderly have the highest score on the service quality of "living arrangements", which shows that the organization can best meet the customer's expectations for the normal living arrangements of the elderly. The service contents of "living arrangements" include cleaning the living environment, washing and changing clothes, taking care of the daily living of the elderly,

helping the elderly to go out and do business, cooking three meals at ordinary times, etc.

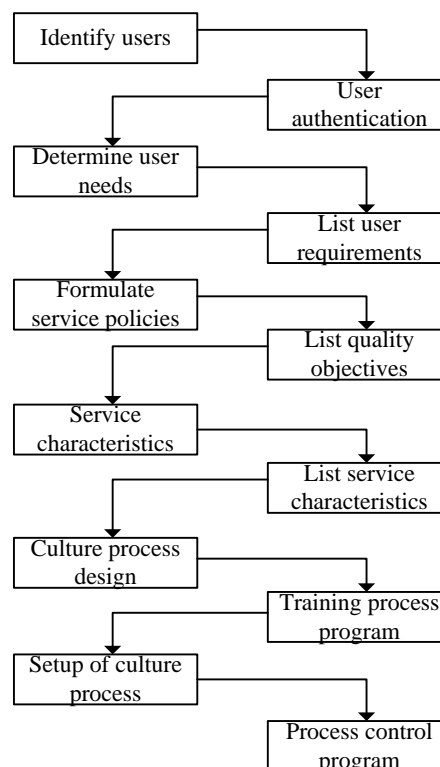


Figure 2. Medical service quality assessment process

The highest score also shows that the service was started earlier in China, the service contents are relatively complete, and the service system is relatively perfect. This is also one of the best parts of the staff in the organization, so the service quality has been satisfied with the elderly. However, the biggest feedback problem in the "living arrangement" item is about the elderly eating at ordinary times. The main reason for this result is that the hardware of the organization's canteen food taste and dining environment do not meet the requirements. Of course, it does not rule out the influence of the elderly's subjective eating preferences, but it is mainly the influence of the organization's financial resources and materials. Some surveys show that the elderly and their families are most concerned about the dining problem in the "living arrangement".

Secondly, the financial and material resources of the organization itself also have a great influence on the "maintenance service". In fact, the daily medical care provided for the elderly mainly includes accompanying the elderly to complete medical treatment and basic daily medical care for the elderly. However, the elderly generally score lower on this item, which indicates that the service quality of this item still falls short of the inner expectations of the elderly. As the elderly grow older, the body of the elderly also goes from bad to worse. The needs of the elderly for daily diagnosis and treatment are also becoming more and more intense. Therefore, the improvement of basic maintenance services is imminent. It is the organization's responsibility to provide basic rehabilitation auxiliary medical care and complete daily health care for the elderly.

Finally, the lowest score is "humanistic care". According to the actual survey, the existing institutions mainly provide two services about humanistic care: accompanying the elderly to talk and reading real-time news for the elderly. The elderly are not very satisfied with the two arrangements, which is the biggest difference from their inner expectations. This also reflects that the content of humanistic care in our existing system is relatively single. Another reason is that China does not pay enough attention to people's mental health, concentrating all its energies on daily living arrangements, but ignoring the spiritual feelings of the elderly. This is very necessary to improve. In addition, the entertainment facilities of the organization cannot meet the basic needs of the elderly and need to be improved urgently.

3. Analysis of Experimental Results

In order to verify the effectiveness of the community home care service quality evaluation model under the "internet plus" era, a comparative test experiment was conducted and the test results were recorded. Randomly collect 100 elderly people for questionnaire survey, analyze the survey results, and compare the evaluation accuracy of the traditional model and the model in this paper in evaluation models with different values, and record the evaluation results, as shown in the following figure.

Observation of the above test results shows that, compared with the traditional methods, the community home medical care service quality evaluation model proposed in this paper has relatively lower error rate in the actual application process, thus it can be reversely deduced. In the actual application process, the evaluation accuracy of the model is relatively significantly improved, which fully meets the research requirements.

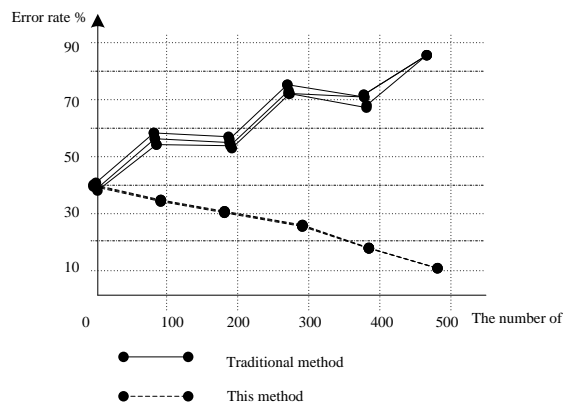


Figure 3. Comparison test results

4. Concluding Remarks

Through the above analysis, we can see that there are no specific papers and research results in the field of special research on the quality of service in the field of medical care for the elderly, as well as the composition and evaluation index of the institutional evaluation model. Based on some advanced theories at home and abroad, this paper draws lessons from the system of combining Servqual system and Gronroos system, and establishes the integrated service content and quality evaluation model of medical care by using the inner perception of the elderly. We analyze and discuss the direction of each service quality and the attribute characteristics of the diversified burden of service, and compare it with the rectangular calculation of the overall satisfaction of the elderly. To analyze the relationship between various directions and service content, service quality, service diversification burden and the overall satisfaction evaluation of elderly customers, so as to expand our new ideas and ideas in the service quality evaluation system of medical care and health care institutions, all of which are of great significance to the medical problems of the elderly.

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