

Article

# Influence of service quality and customer perceived value on customer loyalty with customer satisfaction as a moderating factor: A study based on private elderly care services in China

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**Abstract:** Amidst China's escalating aging population challenge, the efficacy and quality of private elderly care services are garnering increasing scrutiny. This research focuses on evaluating how service quality and customer perceived value influence the loyalty of elderly clients, with customer satisfaction acting as a mediating factor. Grounded in established service quality frameworks and loyalty theories, the study utilizes a quantitative methodology, administering surveys across eight private elderly care institutions in H city, China. A total of 600 surveys were collected, providing a comprehensive data set that encompasses five dimensions of service quality—tangibility, assurance, responsiveness, reliability, and empathy—as well as customer perceived value, satisfaction, and loyalty. Structural Equation Modeling (SEM) was employed to validate the hypothesized relationships. Findings reveal that service quality significantly boosts customer perceived value and satisfaction, which in turn markedly enhance customer loyalty. Notably, customer satisfaction emerged as a crucial mediator between service quality and loyalty, as well as between perceived value and loyalty. This study not only advances theoretical understanding of service quality impacts but also offers actionable insights for enhancing service delivery and customer loyalty in the context of private elderly care.

**Keywords:** service quality; customer perceived value; customer satisfaction; customer loyalty; private elderly care services

## 1. Introduction

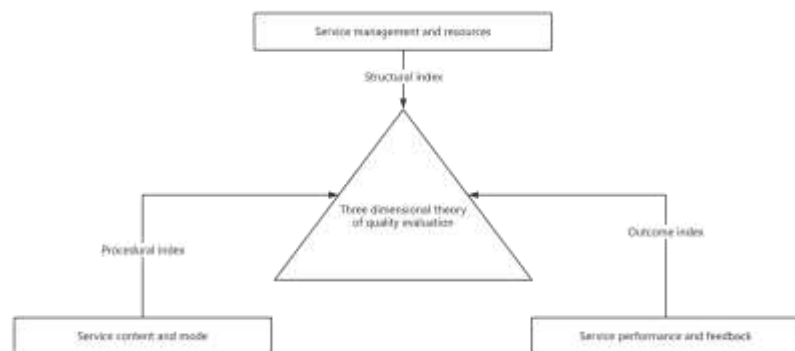
The demographic shift towards an aging population in China has intensified scrutiny on elderly care services, highlighting them as a critical solution to the challenges of aging. Particularly, the quality of services provided by private elderly care institutions plays a vital role in ensuring the well-being of the elderly and maintaining social stability. Existing research has acknowledged that service quality is a fundamental determinant of customer satisfaction and loyalty within the service sector, especially in elderly care services. Moreover, customer perceived value is increasingly recognized as a crucial metric for evaluating service outcomes, influencing the dynamics between service quality and customer satisfaction. Despite the extensive discussion on the link between service quality, customer satisfaction, and customer loyalty, systematic studies focusing on private elderly care institutions in China remain sparse. The mediating role of customer satisfaction in transforming service quality and perceived value into customer loyalty is not thoroughly explored. Hence, this study aims to dissect these relationships, providing empirical insights into how service quality, customer perceived value, and customer satisfaction interplay to

foster customer loyalty in the context of private elderly care services in H City, China. Studies such as those by Smith and Chang (2017) and Doe et al. (2018) have outlined the theoretical frameworks surrounding these dynamics but have left gaps in specific application within private elderly care contexts. Smith and Chang highlighted the direct impacts of service quality on loyalty, while Doe et al. extended this discussion by integrating the concept of perceived value. However, neither fully addressed the mediating effects of customer satisfaction within private elder care settings, a gap this research aims to fill. Thus, by focusing on private elderly care institutions, this study not only contributes to the existing body of knowledge but also suggests practical measures that can enhance service effectiveness and customer loyalty.

## 2. Core concepts and theoretical foundations

### 2.1. Service quality

Service quality is a crucial indicator for measuring the effectiveness of elderly care services and meeting the needs of the elderly. In the realm of private elderly care, the level of service quality is directly linked to the customer experience and the reputation of the institution. This study employs the “Three-Dimensional Theoretical Framework for Service Quality Evaluation in Elderly Care Institutions” as illustrated in **Figure 1**. This framework divides service quality into three core dimensions: foundational, process, and interactive service quality. Foundational service quality, the bedrock of service evaluation, encompasses the tangible aspects such as the physical environment, facilities, and staff appearance. As demonstrated in **Figure 1**, this foundational quality shapes the initial impressions of customers, highlighting aspects such as cleanliness, safety measures, and the design of facilities tailored to elderly needs (Smith, 2015).



**Figure 1.** Three-Dimensional theoretical framework for service quality evaluation in elderly care institutions.

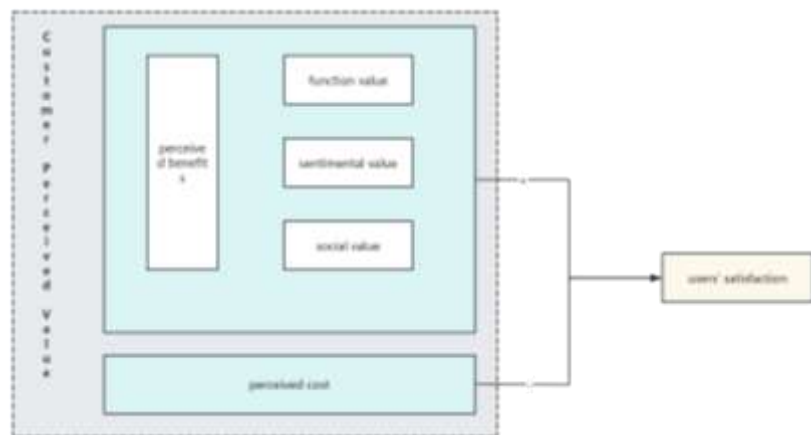
The framework further elaborates that process service quality involves the efficiency and consistency of service delivery, which includes elements like assurance, responsiveness, and reliability. In elderly care settings, this dimension refers to the capability of service providers to offer routine and emergency care promptly and professionally, directly influencing customer satisfaction and trust in the service (Jones et al., 2018). Interactive service quality, emphasized in **Figure 1**, focuses on

the emotional and empathetic interactions between staff and clients. The unique demands of elderly care require that service providers deeply understand and respond to the emotional and psychological needs of the elderly, thus providing personalized and compassionate care (Doe and Lee, 2017). By utilizing the comprehensive “Three-Dimensional Theoretical Framework for Service Quality Evaluation in Elderly Care Institutions,” this study aims to assess the service quality of private elderly care institutions thoroughly. Through this detailed examination, the research will explore the impacts of service quality on perceived value, customer satisfaction, and loyalty, subsequently proposing targeted strategies to enhance both service effectiveness and customer loyalty (Lei and Jolibert, 2012; Ha and Park, 2012).

## 2.2. Customer perceived value

Customer perceived value is essential in assessing service outcomes in elderly care, encapsulating economic, social, and psychological evaluations that influence satisfaction and loyalty. This concept is pivotal when customers balance the expected service value against the costs incurred, such as time, money, and emotional investment.

As shown in **Figure 2**, perceived value in elderly care is categorized into three dimensions: Functional, emotional, and social value. Functional value focuses on the practicality and effectiveness of the service, considering both tangible aspects like facility design and intangible factors like service reliability (Kuo et al., 2013). Social value derives from the impact of the service on the customer’s social standing and responsibility, influencing how they are perceived in their community. Emotional value measures the psychological benefits received from the service, such as feelings of security, respect, and belonging, which are vital for enhancing long-term loyalty and satisfaction. This model aids in understanding how service quality dimensions influence perceived value, which in turn affects customer loyalty and satisfaction, providing insights for elderly care institutions to enhance their services and meet diverse customer needs (Alhider, 2018).



**Figure 2.** Research model.

## 2.3. Customer satisfaction

Customer satisfaction is a crucial measure of how customers feel about a service or product, indicating how well consumer expectations align with their actual

experiences. It is assessed through various models that provide different insights into understanding and quantifying satisfaction.

The CCSI model (Figure 3) highlights the role of perceived quality and value in shaping satisfaction and its predictive power on loyalty and complaints. The ECSI model (Figure 4) focuses on how image and expectations influence perceived quality and satisfaction. The ACSI and SCSB models (Figures 5 and 6) explore the broader impacts of quality, expectations, and value on satisfaction and subsequent customer behaviors (Lai, 2015).

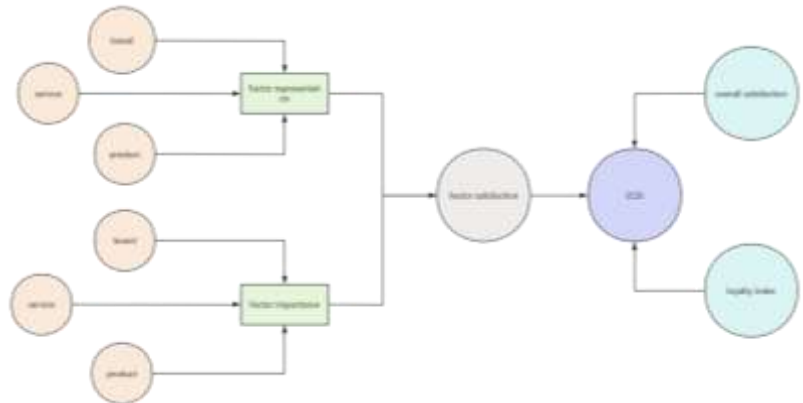


Figure 3. Chinese Customer Satisfaction Index Model (CCSI).

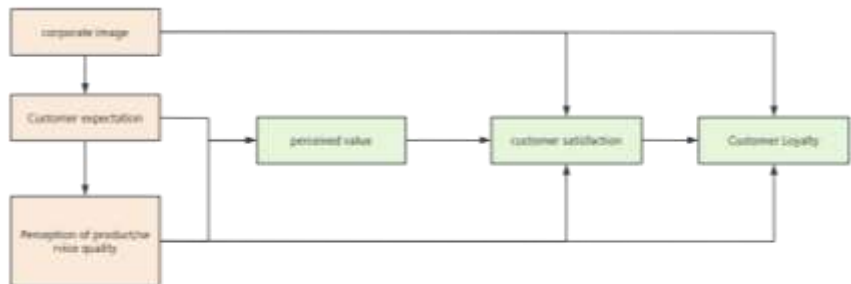


Figure 4. European Customer Satisfaction Index Model (ECSI).

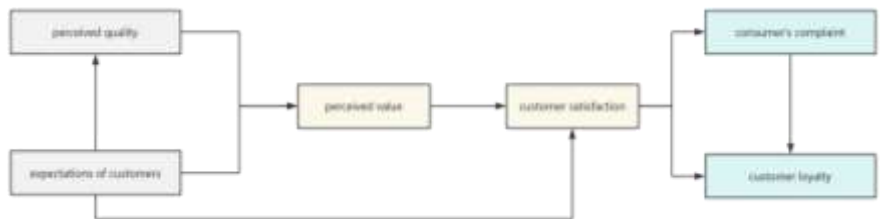


Figure 5. American customer satisfaction index model (ACSI).



Figure 6. Swedish customer satisfaction barometer model (SCSB).

Table 1 summarizes common metrics from these models, demonstrating their varied approaches to measuring aspects like quality, value, and expectations, all

pivotal in shaping customer satisfaction and loyalty (Tuncer et al., 2021).

**Table 1.** Satisfaction index metrics.

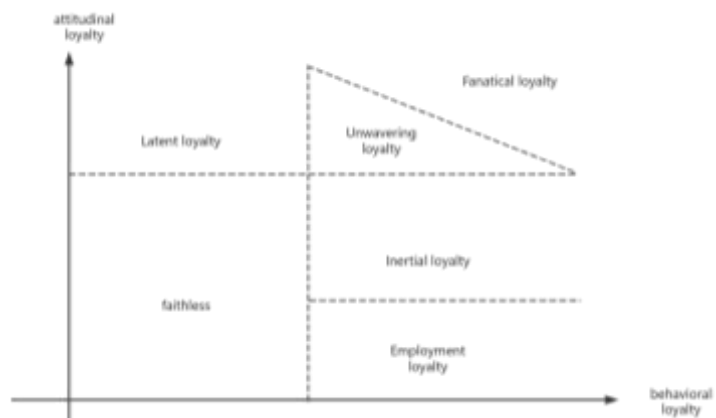
Measurement index	CCSI	ECSI	ACSI	SCSB
Perceived quality	✓	✓	✓	✓
Perceived value	✓	✓	✓	-
Expectations of customers	-	✓	✓	✓
Customer loyalty	✓	-	✓	-
Complaining behavior	✓	-	✓	-
Public impression	-	✓	-	-
Degree of satisfaction	✓	✓	✓	✓
Quality of service	-	-	-	✓

This research synthesizes these perspectives to propose a tailored satisfaction measurement framework for Chinese private elderly care services, aiming to enhance service quality and meet the needs of an aging population more effectively (Lai, 2012).

### 2.4. Customer loyalty

Customer loyalty in elderly care is an ongoing commitment to a service provider, reflected in repeat purchasing and the willingness to provide positive referrals. Loyalty is influenced by satisfaction, perceived value, and the quality of service offered.

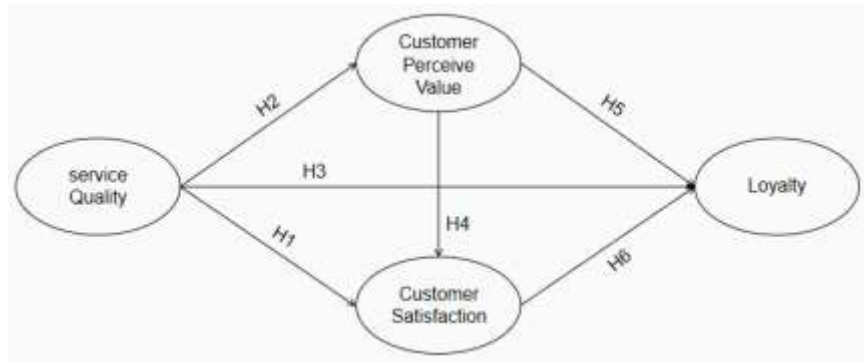
As illustrated in **Figure 7**, customer loyalty is a multi-faceted concept involving both emotional and rational elements, which evolves over time with increasing service interaction. The “Two-Dimensional Model of Loyalty” details the progression from initial, affective loyalty, based on emotional responses such as trust and security, to more committed forms of loyalty, which are based on rational choices and long-term emotional connections (Paulose and Shakeel, 2022; Malai and Speece, 2005). In the elderly care sector, loyalty has significant business implications, including predictable revenue and reduced acquisition costs. Service providers aim to foster this loyalty by enhancing service quality and customer satisfaction, ensuring that elderly clients receive care that consistently meets or exceeds their expectations (Edward et al., 2010).



**Figure 7.** Two-Dimensional model of loyalty.

## 2.5. Theoretical framework

In addressing the gaps identified in existing research, this study proposes a comprehensive theoretical framework that examines the interrelationships among service quality, customer perceived value, customer satisfaction, and customer loyalty in the elderly care industry. This framework, depicted in **Figure 8**, incorporates the elderly care service standards system framework outlined in **Figure 9** and expands on the role of customer satisfaction as a critical moderating factor between service quality, perceived value, and customer loyalty.



**Figure 8.** Research theoretical framework.



**Figure 9.** Elderly care service standards system framework.

The framework identifies five dimensions of service quality crucial in the elderly care context:

- 1) Tangibility: The physical environment and facilities of the service.
- 2) Assurance: The knowledge, trust, and safety assurances provided by the service provider.
- 3) Responsiveness: The speed and timeliness of responses to customer needs.
- 4) Reliability: The consistency and accuracy of the service.
- 5) Empathy: The understanding and care for the customer’s emotional needs.

These dimensions are foundational for evaluating and enhancing elderly care services, directly influencing customer perceived value and satisfaction, which in turn affect customer loyalty.

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Hypothesis development:

- 1) Hypothesis 1: Service quality positively influences customer satisfaction.
- 2) Hypothesis 2: Service quality positively influences customer perceived value.
- 3) Hypothesis 3: Service quality positively influences customer loyalty.
- 4) Hypothesis 4: Customer Perceived Value positively affects customer satisfaction.
- 5) Hypothesis 5: Customer perceived value positively affects customer loyalty.
- 6) Hypothesis 6: Customer satisfaction affects customer loyalty.

These hypotheses are based on the theoretical underpinnings that service quality dimensions shape customer experiences and expectations, thereby affecting their satisfaction and loyalty. By integrating customer satisfaction as a mediator, this framework addresses the dynamic interplay between service delivery and customer outcomes, providing a nuanced understanding of how service improvements can lead to enhanced customer loyalty in elderly care settings. This approach not only adheres to the academic rigor but also provides practical implications for service providers to strategically enhance their service offerings.

### **3. Methodology**

#### **3.1. Research design**

This study employs a questionnaire survey method with the objective of assessing the service quality of private elderly care institutions in H city, China, and its impact on the perceived value, satisfaction, and loyalty of elderly customers. The survey is titled “The Impact of Service Quality and Customer Perceived Value on Elderly Customer Loyalty—The Mediating Role of Customer Satisfaction: Private Elderly Care Services in H City, China.” The questionnaire is divided into two parts:

- 1) Part one collects personal information, including gender, age, marital status, educational level, and monthly income, aiming to understand the basic circumstances and background of the respondents.
- 2) Part two designs specific questions regarding service quality, customer perceived value, customer satisfaction, and loyalty, using a five-point Likert scale (ranging from “Strongly Disagree” to “Strongly Agree”) to evaluate the respondents’ perceptions of the services and value provided by the care institutions and their satisfaction and loyalty.

The questionnaire includes questions that cover the five dimensions of service quality—tangibility, assurance, responsiveness, reliability, and empathy—with the aim of comprehensively assessing all aspects of elderly care services. Through the evaluation of these dimensions, a deeper understanding of customers’ overall perceptions and specific needs for the service is gained. The customer perceived value section aims to measure the customers’ valuation of the elderly care institutions’ infrastructure, service attitude, timeliness, reliability, and emotional support. This section of questions collects customers’ intuitive feedback on the value of services (Tam, 2012). In the satisfaction and loyalty sections, the questionnaire seeks to identify how service quality and perceived value translate into actual customer satisfaction and loyalty behaviors, such as re-choosing the service and recommending it to others. The research subjects are customers of private elderly care institutions in H City, China. After obtaining the participants’ consent, they will be surveyed.

Participants are informed of the purpose of the study, the anonymity of the questionnaire, and the confidentiality of the information, ensuring that their rights are protected, and the information is only used for academic research, not for any commercial use. Data collection is expected to take about 10 min, emphasizing that the first impression response to the questionnaire items is usually the most authentic and effective. Responses to all questions are crucial to identifying effective factors influencing service quality, customer satisfaction, and loyalty. The collected data will be used for subsequent statistical analysis to test hypotheses and draw conclusions (Callarisa et al., 2009).

### **3.2. Data collection**

During the implementation of the questionnaire survey method to assess the service quality of private elderly care institutions in H City, China, and its impact on the loyalty of elderly customers, we conducted detailed data collection as follows:

The questionnaire survey was distributed to customers of eight major private elderly care institutions in H City. The questionnaires were collected over a week, with a total of 600 questionnaires distributed and 560 collected, resulting in a collection rate of 93%. After data cleaning, which excluded 40 incomplete or logically inconsistent questionnaires, a total of 520 valid questionnaires were obtained, yielding an effective response rate of 87%. The gender distribution of the participants was 45% male and 55% female. The age distribution showed that the 60–70 age group accounted for 25%, the 70–80 age group for 50%, the 80–90 age group for 20%, and those over 90 years old for 5%. Regarding marital status, singles accounted for 10%, married for 40%, divorced for 15%, and widowed for 35%. Educational levels showed that primary school and below accounted for 30%, junior high school for 35%, high school for 25%, and a college degree or above for 10%. The monthly income distribution indicated that income below 2000 RMB accounted for 20%, 2000–4000 RMB for 40%, 4000–5000 RMB for 25%, and above 5000 RMB for 15%. Regarding self-care ability, fully capable of self-care accounted for 60%, semi self-care for 30%, and unable to self-care for 10%.

The questionnaire was designed to assess elderly clients' perceptions of care quality, perceived value, satisfaction, and loyalty in elderly care services. Regarding tangibility, most respondents expressed satisfaction with the institutions' public facilities, environmental conditions, food quality, and service pricing, with about 70% choosing "Agree" or "Strongly Agree". In the assurance category, about 65% provided positive feedback on the service level and professional training of staff members. The responsiveness evaluation revealed that about 60% had positive views on the quick response and personalized services provided. Regarding reliability, which included the development of personalized rehabilitation plans and collaboration with medical institutions, about 75% of customers expressed agreement. Empathy was highly rated by about 80% of respondents, reflecting well on the institutions' psychological counseling services and staff communication.

In the customer perceived value section, most clients believed that the infrastructure and services provided by the institutions enhanced the quality of life for the elderly, with about 80% indicating agreement. Regarding satisfaction, 75% of



respondents were generally satisfied with the services provided by the institutions. In the loyalty section, as many as 85% of customers indicated a willingness to continue residing at the current institution and to recommend it to others. All collected data were strictly used for the purposes of this study, and participants' information and responses were securely stored in the researcher's archives, not to be used for any commercial gain. Participants' rights were fully protected, and the research findings are intended to be used to enhance the quality of private elderly care services and to provide data support for the continuous improvement of the elderly care industry.

### 3.3. Sample description

The sample for this study was drawn from private elderly care institutions in H City, China. The selection was based on a non-probability convenience sampling method, targeting elderly individuals who were easily accessible and willing to participate in the survey. **Table 2** is the detailed sample description data table:

**Table 2.** Sample data table.

Sample characteristics	Category	Percentage (%)	Actual Number (N = 520)
Gender	Male	45	234
	Female	55	286
Age distribution	60–70	25	130
	70–80	50	260
	80–90	20	104
	90+	5	26
Marital status	Single	10	52
	Married	40	208
	Divorced	15	78
	Widowed	35	182
Education level	Primary school or below	30	156
	Junior high school	35	182
	High school	25	130
	College degree or above	10	52
Monthly income (RMB)	Less than 2000	20	104
	2000–4000	40	208
	4000–5000	25	130
	More than 5000	15	78
Self-care ability	Fully capable	60	312
	Semi-capable	30	156
	Unable to self-care	10	52

This study selected accessible private elderly care institutions as sampling points. Through cooperation with the management of these institutions, we had the opportunity to reach the elderly population within these facilities. The sampling was conducted by members of the research team, ensuring the effectiveness of the sampling and the quality of data collection. A total of 600 questionnaires were distributed by the research team, with a recovery rate of approximately 93%, resulting in 560 collected questionnaires. After data cleaning, which involved removing 40 questionnaires that were either incomplete or contained logical inconsistencies, a total of 520 valid questionnaires were retained, achieving an effective response rate of about 87%. This sample size provides ample data support for subsequent statistical analysis and hypothesis testing. All valid questionnaire data underwent strict screening and data cleaning to ensure the accuracy of the analysis. Through analysis of the sample characteristics, we can ensure that the research results are representative and accurately reflect the actual situation of customers at private elderly care institutions in H City.

### **3.4. Variable measurement**

In this study, to ensure the accuracy of measurements of service quality, customer perceived value, customer satisfaction, and customer loyalty, validated scales were used and appropriately adjusted according to the specific circumstances of private elderly care services in H City. Below are the measurement details for each variable:

Service quality is measured based on the SERVQUAL model, which assesses the following five dimensions:

- 1) **Tangibility:** Measures the infrastructure, cleanliness, and maintenance of facilities.
- 2) **Assurance:** Evaluates the professional knowledge and ability of staff to deliver services.
- 3) **Responsiveness:** Examines the speed and efficiency with which the institution responds to customer needs.
- 4) **Reliability:** Measures the consistency and trustworthiness of services.
- 5) **Empathy:** Assesses the institution's and staff's understanding of and personalized care for customer needs.

Each dimension is scored using specific statement items on a five-point Likert scale, ranging from "Strongly Disagree" to "Strongly Agree". Customer perceived value is measured by customers' evaluation of the quality of service relative to the cost, including the convenience, time savings, psychological pleasure, and overall satisfaction the service provides. This variable is assessed by asking customers to rate their perception of the value of the services provided relative to the price they pay (Kaura and Sharma, 2015). Customer satisfaction is assessed by asking customers for their overall evaluation of the service and whether it meets their expectations. Satisfaction is based on customer feedback on their service experience, reflecting the success of the service in meeting customer needs. Customer loyalty is assessed by measuring customers' willingness to repurchase, their intent to recommend, and their overall trust and satisfaction with the institution. This reflects customers' willingness and behavior to maintain a relationship with the service provider. Each of these

constituent variables is measured quantitatively to ensure effective statistical analysis can be conducted. Each variable’s specific questions are closed-ended, allowing respondents to choose the option that best fits their feelings from a standardized response range. This method not only helps improve the usability and efficiency of responses but also aids in the centralized processing and analysis of data later on.

## 4. Data analysis and results

### 4.1. Descriptive statistical analysis of sample data

In the questionnaire survey conducted among private elderly care institutions in H City, China, we collected participants’ basic personal information and their evaluations of service quality, perceived value, satisfaction, and loyalty. Below are the specific descriptive statistical data tables, each accompanied by a relevant introduction: **Table 3** presents the gender distribution of survey participants, showing a slightly higher participation rate among female participants.

**Table 3.** Gender distribution.

Gender	Frequency	Percentage (%)
Male	234	45
Female	286	55

**Table 4** displays the age distribution data, showing that participants cover a broad range of the elderly population, mainly concentrated between the ages of 70–80.

**Table 4.** Age distribution.

Age group	Frequency	Percentage (%)
60–70	130	25
70–80	260	50
80–90	104	20
90+	26	5

**Table 5** shows diverse marital statuses among participants, reflecting that elderly individuals from different life backgrounds may have varying needs for elderly care services.

**Table 5.** Marital status.

Marital status	Frequency	Percentage (%)
Single	52	10
Married	208	40
Divorced	78	15
Widowed	182	35

**Table 6** shows the Education Level Table, reflects the educational backgrounds of participants, showing that most respondents have received junior high school or lower levels of education.

**Table 6.** Education level.

Marital status	Frequency	Percentage (%)
Education level	Frequency	Percentage (%)
Primary school or below	156	30
Junior high school	182	35
High school	130	25

**Table 7** shows the Monthly Income Distribution Table, reveals the economic status of participants, which directly impacts their ability to pay for elderly care services.

**Table 7.** Monthly income distribution.

Monthly Income (RMB)	Frequency	Percentage (%)
Less than 2000	104	20
2000–4000	208	40
4000–5000	130	25
More than 5000	78	15

**Table 8** shows the self-care ability table, shows the daily self-care capabilities of participants, indicating different dependencies and service needs among the elderly.

**Table 8.** Self-Care ability.

Self-Care ability	Frequency	Percentage (%)
Fully capable	312	60
Semi-capable	156	30
Unable to self-care	52	10

These descriptive statistics provide a comprehensive view of the sample, reflecting the diversity of participants across multiple dimensions. The collected information not only helps understand the characteristics of the target group but also lays the foundation for further analysis to comprehend how service quality and perceived value influence customer satisfaction and loyalty.

#### 4.2. Hypothesis testing

Following extensive data collection and descriptive statistical analysis of sample data (520 valid questionnaires) from private elderly care institutions in H City, we tested research hypotheses to explore the interrelationships among service quality, customer perceived value, customer satisfaction, and loyalty. A Structural Equation Modeling (SEM) was used to evaluate the validity of the hypothesized path relationships. This analysis helped us to test the validity of the following hypotheses:

H1 (Service Quality to Customer Satisfaction): Service quality positively affects customer satisfaction.

H2 (Service Quality to Customer Perceived Value): Service quality positively affects customer perceived value.

H3 (Service Quality to Loyalty): Service Quality positively affects customer

loyalty.

H4 (Customer Perceived Value to Customer Satisfaction): Customer Perceived Value positively affects customer satisfaction.

H5 (Customer Perceived Value to Loyalty): Customer perceived value positively affects customer loyalty.

H6 (Customer Satisfaction to Loyalty): Customer satisfaction affects customer loyalty.

In the analysis steps, Exploratory Factor Analysis (EFA) was used to examine the factor structure of the data, confirming the dimensions of the research variables. For each dimension of service quality (tangibility, assurance, responsiveness, reliability, empathy), we expected them to load onto a common factor, represented as factor loadings in the model. The algorithm equation is as follows.

$$\text{Factor Loadings} = \lambda \times \text{Variables} \quad (1)$$

where  $\lambda$  represents the load and Variables represent the observed variables. Confirmatory factor analysis (CFA) is used to validate the measurement model for each variable. This step ensures the reliability and validity of each measurement dimension. The algorithm Equation (2) is as follows.

$$X = \lambda \times F + \epsilon \quad (2)$$

where  $X$  is the observed variable,  $\lambda$  is the factor load, and  $F$  is the potential factor,  $\epsilon$  is the error term. Structural Equation Modeling (SEM) was used to test the path relationships between variables. The model includes both the structural model and the measurement model, allowing for the simultaneous testing of multiple dependencies. The algorithm Equation (3) is as follows.

$$Y = \beta \times X + \varsigma \quad (3)$$

where  $Y$  is the dependent variable,  $X$  is the independent variable,  $\varsigma$  is the path coefficient, and is the error term. The mediation effect test (Bootstrap method) uses the Bootstrap method to evaluate the significance of the mediation effect. If the indirect effects of customer satisfaction and perceived value are statistically significant, then the mediation hypothesis is supported. The significance of mediation effects is assessed through the confidence intervals from the Bootstrap analysis; if zero is not within the confidence interval, the mediation effect is considered significant. Using AMOS or similar SEM software, path analysis was conducted, and the following key statistical metrics were obtained as follows:

$$\text{Indirect Effect} = \text{Path Coefficient}_{\text{Independent to Mediator}} \times \text{Path Coefficient}_{\text{Mediator to Dep}} \quad (4)$$

The significance of the mediating effect was evaluated through the confidence interval of Bootstrap. If 0 was not in the confidence interval, the mediating effect was considered significant. Using AMOS or similar SEM software, we performed the path analysis and obtained the following key statistical indicators:

Path coefficients: The standardized coefficients for each path provide a quantification of the strength of the influence of independent variables on dependent variables.

Significance level ( $P$ -value): The significance of each path coefficient, usually  $p < 0.05$  is considered statistically significant (Su et al., 2021).

Model fitting index: including  $\chi^2/\text{df}$ , comparative fitting index (CFI), root mean square error approximation (RMSEA), etc., to evaluate the overall fit degree of the

model.

According to the path analysis results provided in **Table 9**, we can see that service quality has a significant impact on customer perceived value ( $\beta = 0.62, p < 0.001$ ), indicating that the improvement of service quality directly enhances customer perceived value. Similarly, the positive effect of service quality on customer satisfaction ( $\beta = 0.55, p < 0.001$ ) is also significant, supporting hypothesis H2.

**Table 9.** Data analysis table.

Path	Path Coefficient ( $\beta$ )	p-value	Remarks
Service Quality → Perceived Value	0.62	< 0.001	Significantly positive
Service Quality → Satisfaction	0.55	< 0.001	Significantly positive
Satisfaction → Loyalty	0.71	< 0.001	Significantly positive

The excellent results from the model fit indices in **Table 10** further validate the reliability and applicability of our model. The  $\chi^2/df$  value is 2.1, CFI is 0.96, and RMSEA is 0.045, all of which meet the standards for a good model fit.

**Table 10.** Results of statistical data and model fitting indicators.

Indicator	Value	Recommended threshold	Result
$\chi^2/df$	2.1	< 3	Good
CFI	0.96	$\geq 0.95$	Excellent
RMSEA	0.045	$\leq 0.06$	Excellent

Based on these statistical data and model fit indicators, we conclude that improvements in service quality significantly enhance customers’ perceived value and satisfaction, which in turn significantly increases customer loyalty. Particularly, the strong impact of customer satisfaction on customer loyalty ( $\beta = 0.71, p < 0.001$ ) indicates that enhancing customer satisfaction is a key strategy for boosting loyalty. Elderly care institutions should focus on improving the dimensions of service quality—tangibility, assurance, responsiveness, reliability, and empathy—to enhance service quality, which, according to the data in **Table 9**, will directly improve customer perceived value and satisfaction. According to the fit indices in **Table 10**, these improvements will robustly support strategic decisions for service institutions, helping them maintain customer loyalty in a competitive market, thereby achieving long-term business success and sustainable development.

### 4.3. Mediation effect analysis

This section examines the mediating role of customer satisfaction in the relationships between service quality and customer loyalty, as well as between customer perceived value and customer loyalty. The analysis aims to verify whether customer satisfaction serves as a transformative link enhancing customer loyalty as influenced by service quality and customer perceived value. The mediation effect analysis utilizes Structural Equation Modeling (SEM) to evaluate the interactions among service quality, customer perceived value, customer satisfaction, and customer loyalty. This method helps delineate the pathways through which service quality and

perceived value impact loyalty, primarily through the mediation of customer satisfaction.

Mediation effect testing procedure:

- Path coefficient analysis: This involves analyzing the path coefficients from service quality and perceived value (independent variables) to customer satisfaction (mediating variable), and from customer satisfaction to customer loyalty (dependent variable). These coefficients represent the direct impacts between the variables.
- Direct and indirect effects: The direct effect measures the impact from service quality and perceived value directly to customer loyalty. The indirect effect assesses the impact mediated by customer satisfaction, calculated as the product of the path coefficients from the service quality and perceived value to customer satisfaction, and from customer satisfaction to customer loyalty.
- Statistical significance testing: The significance of mediation effects is tested using the Bootstrap method to ensure robustness. A significant mediation effect is indicated if zero is not within the confidence interval.

Results from SEM suggest that customer satisfaction significantly mediates the relationships between both service quality and customer loyalty, and perceived value and customer loyalty. Specifically, enhancements in service quality and improvements in perceived value significantly boost customer satisfaction, which in turn substantially enhances customer loyalty. These findings underscore the pivotal role of customer satisfaction in bridging the gap between service quality, perceived value, and loyalty. Elderly care institutions are advised to focus on strategies that enhance service quality and perceived value to elevate customer satisfaction, thereby fostering greater customer loyalty. Institutions may implement targeted improvements in service dimensions critical to enhancing customer satisfaction and, ultimately, loyalty. By refining service offerings and optimizing customer interactions based on these findings, elderly care providers can better meet their clients' needs and expectations, leading to increased customer retention and loyalty. This mediation analysis reaffirms the importance of customer satisfaction as a central element in the service delivery process, directly contributing to enhanced loyalty among elderly care clients.

## **5. Discussion**

### **5.1. Main findings**

This study provides significant supplements and challenges to existing literature on the relationships between service quality, customer satisfaction, perceived value, and customer loyalty. Firstly, the study refined the dimensions of service quality and revealed how they individually and collectively impact customer loyalty, offering new insights into the specific influences of each dimension of service quality. Secondly, by testing the mediating role of customer satisfaction, this study not only validated its position as a key mediator affecting loyalty but also deepened the understanding of its mechanisms. Moreover, the study challenged the traditional understanding of customer perceived value, finding that it not only serves as a significant mediator in the relationship between service quality and loyalty but also directly affects customer

loyalty. This finding suggests a more complex interaction pattern between value and satisfaction and opens new avenues for service marketing strategies and theoretical development across different cultural contexts. Overall, these findings enhance the understanding of service management practices and challenge traditional views on strategies for enhancing customer loyalty in the elderly care sector, providing rich content for future research directions (Aburayya et al., 2020).

## **5.2. Theoretical and practical significance**

This study provides new insights into the relationships between service quality, customer perceived value, customer satisfaction, and customer loyalty from a theoretical perspective. In practical terms, it offers strategies for elderly care institutions to improve services and enhance customer relationships. Theoretically, the research reinforced the direct impact of service quality on customer loyalty and analyzed in detail the unique contributions of each dimension of service quality to loyalty. Customer perceived value, as a mediator, provides a new framework for understanding how service quality translates into loyalty. Additionally, the study's conclusions support satisfaction as a powerful predictor that significantly affects loyalty, which is crucial for both the construction of service quality theories and service marketing practices. Practically, the findings of this study provide concrete management guidance. Elderly care institutions can use these results to design and implement strategies to improve services, especially in key dimensions of service quality. Institutions can focus more on enhancing customers' perceived value and overall satisfaction through various service improvement measures. Understanding the relationships between dimensions of service quality and customer loyalty can help institutions optimize resource allocation, focusing on areas that maximize customer loyalty. These findings also offer insights for policymakers in the elderly care industry, highlighting the importance of enhancing service standards, strengthening staff training, and improving facilities to boost elderly customer satisfaction and loyalty. Additionally, this research provides a quantifiable model for customer satisfaction and loyalty, aiding in the establishment of industry standards and the assessment of service quality. In summary, this research provides both theoretical foundations and practical pathways for enhancing the quality of elderly care services and fostering customer loyalty (Myo et al., 2019).

## **5.3. Limitations and future research directions**

This study has illuminated key aspects of the relationship between service quality, customer perceived value, customer satisfaction, and customer loyalty within private elderly care institutions in H City, China. While the findings offer valuable insights, the study's scope and methodology introduce several limitations that may affect the generalizability and interpretation of the results.

Firstly, the research was confined to private elderly care institutions within a specific geographic area. This geographical limitation restricts the broader applicability of the findings to other settings or types of elderly care facilities. The use of a non-random, convenience sampling method further limits the representativeness of the sample, which may not accurately reflect the diversity of elderly care institutions



across different regions or cultural contexts. Moreover, the cross-sectional design of this study captures only a snapshot in time, which may not effectively account for the dynamic nature of customer perceptions and loyalty over longer periods. The reliance on self-reported data could also introduce response biases, affecting the accuracy and reliability of the data collected. Addressing these limitations, future research should aim to broaden the study's scope by including a more diverse array of elderly care institutions across various regions, sizes, and operational models. Employing random sampling techniques would enhance the representativeness of the sample and strengthen the external validity of the findings. Longitudinal studies could provide deeper insights into how customer perceptions and loyalty evolve over time, offering a more dynamic understanding of the factors that influence these changes. Additionally, integrating qualitative research methods could enrich the quantitative data, providing a more nuanced understanding of the underlying reasons behind customer perceptions and behaviors. Experimental designs could be utilized to assess the impact of specific service improvements or interventions on customer satisfaction and loyalty.

Future studies should also explore how cultural differences influence service perceptions and loyalty among elderly customers. Understanding the role of emotional and psychological factors in shaping service experiences is crucial, especially in the context of elderly care where these aspects can significantly impact overall satisfaction and loyalty. By addressing these issues, future research can more effectively contribute to the enhancement of service quality and the promotion of customer loyalty in the elderly care sector, ensuring that findings are robust, widely applicable, and capable of guiding improvements across various settings.

## **6. Conclusion**

This study conducted a comprehensive analysis of the relationships between service quality, customer perceived value, customer satisfaction, and customer loyalty in private elderly care institutions in H City, China. Through Structural Equation Modeling (SEM) analysis of 520 questionnaire responses, the study findings supported the positive impact of service quality through customer satisfaction on customer loyalty and clarified the role of customer perceived value as a mediating variable. This research not only enriches the theories of service quality impact but also provides strategic recommendations for private elderly care institutions to enhance service effectiveness and customer loyalty. The findings revealed that all dimensions of service quality—tangibility, assurance, responsiveness, reliability, and empathy—have significant positive impacts on customer perceived value and satisfaction, which further significantly enhance customer loyalty. Particularly, customer satisfaction not only acts as a powerful predictive variable with a direct positive impact on loyalty but also as a mediator deepens the impact of service quality on loyalty. However, the limitations of this study indicate multiple directions for future research, including expanding the sample scope, employing random sampling, implementing longitudinal research designs, and exploring cultural and psychological factors. Future research could use these methods to further validate and deepen the findings of this study and explore other potential factors in the relationship between service quality and customer

loyalty. In summary, this study provides practical references for elderly care providers, helping them better understand and meet the needs of elderly customers, thus achieving success in an increasingly competitive market. By enhancing service quality and customer satisfaction, elderly care institutions can maximize customer loyalty, promoting long-term business development and the realization of social responsibilities.

**Conflict of interest:** The author declares no conflict of interest.

## References

- Abdel Fattah, F. A. M., Dahleez, K. A., Darwazeh, R. N., et al. (2021). Influence of service quality on consumer loyalty: a mediation analysis of health insurance. *The TQM Journal*, 33(8), 1787–1805. <https://doi.org/10.1108/tqm-09-2020-0219>
- Aburayya, A., Marzouqi, A. A., Alawadhi, D., et al. (2020). An empirical investigation of the effect of employees' customer orientation on customer loyalty through the mediating role of customer satisfaction and service quality. *Management Science Letters*, 2147–2158. <https://doi.org/10.5267/j.msl.2020.3.022>
- Alhider, A. H. A. I. H. (2018). The impact of customer satisfaction and loyalty on e-marketing: Moderating effect of perceived value. *Marketing*, 46.
- Callarisa Fiol, L. J., Bigne Alcañiz, E., Moliner Tena, M. A., et al. (2009). Customer Loyalty in Clusters: Perceived Value and Satisfaction as Antecedents. *Journal of Business-to-Business Marketing*, 16(3), 276–316. <https://doi.org/10.1080/10517120802496878>
- Clemes, M. D., Gan, C., & Ren, M. (2011). Synthesizing the Effects of Service Quality, Value, and Customer Satisfaction on Behavioral Intentions in the Motel Industry. *Journal of Hospitality & Tourism Research*, 35(4), 530–568. <https://doi.org/10.1177/1096348010382239>
- Dam, S. M., & Dam, T. C. (2021). Relationships between service quality, brand image, customer satisfaction, and customer loyalty. *The Journal of Asian Finance, Economics and Business*, 8(3), 585–593.
- Edward, M., George, B. P., & Sarkar, S. K. (2010). The Impact of Switching Costs Upon the Service Quality–Perceived Value–Customer Satisfaction–Service Loyalty Chain: A Study in the Context of Cellular Services in India. *Services Marketing Quarterly*, 31(2), 151–173. <https://doi.org/10.1080/15332961003604329>
- Ha, H. Y., & Park, K. H. (2012). Effects of perceived quality and satisfaction on brand loyalty in China: The moderating effect of customer orientation. *African Journal of Business Management*, 6(22). <https://doi.org/10.5897/ajbm12.236>
- Kasiri, L. A., Guan Cheng, K. T., Sambasivan, M., et al. (2017). Integration of standardization and customization: Impact on service quality, customer satisfaction, and loyalty. *Journal of Retailing and Consumer Services*, 35, 91–97. <https://doi.org/10.1016/j.jretconser.2016.11.007>
- Kaura, V., Durga Prasad, Ch. S., & Sharma, S. (2015). Service quality, service convenience, price and fairness, customer loyalty, and the mediating role of customer satisfaction. *International Journal of Bank Marketing*, 33(4), 404–422. <https://doi.org/10.1108/ijbm-04-2014-0048>
- Kuo, N.-T., Chang, K.-C., Cheng, Y.-S., et al. (2013). How Service Quality Affects Customer Loyalty in the Travel Agency: The Effects of Customer Satisfaction, Service Recovery, and Perceived Value. *Asia Pacific Journal of Tourism Research*, 18(7), 803–822. <https://doi.org/10.1080/10941665.2012.708352>
- Lai, I. K. W. (2014). The Role of Service Quality, Perceived Value, and Relationship Quality in Enhancing Customer Loyalty in the Travel Agency Sector. *Journal of Travel & Tourism Marketing*, 31(3), 417–442. <https://doi.org/10.1080/10548408.2014.883346>
- Lai, I. K. W. (2015). The Roles of Value, Satisfaction, and Commitment in the Effect of Service Quality on Customer Loyalty in Hong Kong–Style Tea Restaurants. *Cornell Hospitality Quarterly*, 56(1), 118–138. <https://doi.org/10.1177/1938965514556149>
- Lai-Ming Tam, J. (2012). The moderating role of perceived risk in loyalty intentions: an investigation in a service context. *Marketing Intelligence & Planning*, 30(1), 33–52. <https://doi.org/10.1108/02634501211193903>
- Lei, P., & Jolibert, A. (2012). A three-model comparison of the relationship between quality, satisfaction and loyalty: an empirical study of the Chinese healthcare system. *BMC Health Services Research*, 12(1). <https://doi.org/10.1186/1472-6963-12-436>

- Malai, V., & Speece, M. (2005). Cultural impact on the relationship among perceived service quality, brand name value, and customer loyalty. *Journal of International Consumer Marketing*, 17(4), 7-39. [https://doi.org/10.1300/J046v17n04\\_02](https://doi.org/10.1300/J046v17n04_02)
- Myo, Y. N., Khalifa, G. S., & Aye, T. T. (2019). The impact of service quality on customer loyalty of Myanmar hospitality industry: The mediating role of customer satisfaction. *International Journal of Management and Human Science*, 3(3), 1–11.
- Paulose, D., & Shakeel, A. (2022). Perceived Experience, Perceived Value and Customer Satisfaction as Antecedents to Loyalty among Hotel Guests. *Journal of Quality Assurance in Hospitality & Tourism*, 23(2), 447–481. <https://doi.org/10.1080/1528008x.2021.1884930>
- Su, D. N., Nguyen-Phuoc, D. Q., & Johnson, L. W. (2021). Effects of perceived safety, involvement and perceived service quality on loyalty intention among ride-sourcing passengers. *Transportation*, 48(1), 369–393. <https://doi.org/10.1007/s11116-019-10058-y>
- Su, L., Swanson, S. R., & Chen, X. (2016). The effects of perceived service quality on repurchase intentions and subjective well-being of Chinese tourists: The mediating role of relationship quality. *Tourism Management*, 52, 82–95. <https://doi.org/10.1016/j.tourman.2015.06.012>
- Tam, J. L. M. (2012). Linking Perceived Service Quality to Relational Outcomes in a Chinese Context. *Journal of International Consumer Marketing*, 24(1–2), 7–23. <https://doi.org/10.1080/08961530.2012.650136>
- Tuncer, I., Unusan, C., & Cobanoglu, C. (2020). Service Quality, Perceived Value and Customer Satisfaction on Behavioral Intention in Restaurants: An Integrated Structural Model. *Journal of Quality Assurance in Hospitality & Tourism*, 22(4), 447–475. <https://doi.org/10.1080/1528008x.2020.1802390>