

Measuring the quality of medical examination and treatment services at non-public hospitals through people's satisfaction: A study in Hanoi city

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Abstract: The study aims to measure the quality of medical examination and treatment services at non-public hospitals in Hanoi, based on the satisfaction of people, using the SERVPERF theoretical model. The data collected is analyzed using SPSS 26 software, including reliability testing, exploratory factor analysis, and binary logistic regression analysis. The study's results indicate that eight factors positively influence people's satisfaction with medical examination and treatment services at non-public hospitals in Hanoi city. These factors include assurance, hospital fees, reliability, medical examination and treatment outcomes, responsiveness, tangibles, support services, and empathy. The study results provide an important theoretical and practical foundation for stakeholders to improve the quality of medical examination and treatment services at non-public hospitals, aiming to enhance people's satisfaction.

Keywords: *medical examination and treatment services, non-public hospitals, satisfaction, Hanoi city*

1. Introduction

Vietnam is located in Southeast Asia, a region that is developing, and people's lives are improving daily. Hence, the demand for healthcare is not limited to "curing diseases." It includes quality, safe, and humane medical service. In particular, in large cities such as Hanoi, the rapid urbanization rate and the ever-increasing population put tremendous pressure on the public hospital system regarding quantity and quality of service. Therefore, the emergence and development of non-public hospitals play an important role in sharing the burden on public health while providing more options for people seeking medical examination and treatment.

Currently, non-public hospitals offer modern facilities, flexible medical examination and treatment processes, optimized waiting times, and high professionalism in service. However, in a service environment where patient perception plays an increasingly crucial role, people's satisfaction reflects not only the tangible quality of services but also serves as a basis for evaluating the sustainability and competitiveness of hospitals in the market. Particularly within the medical industry, where patient trust and peace of mind are paramount, assessing service quality from the user's perspective assumes greater significance. A hospital may possess state-of-the-art medical equipment and a team of highly qualified physicians; however, it may

experience a decline in patient satisfaction due to inconsistent service procedures, unempathetic care attitudes, or hospital fees that do not align with the value provided.

Conversely, the satisfaction of individuals constitutes a crucial metric in evaluating the quality of health services and serves as an indicator for prospective returns or referrals. In light of this fact, it is essential to assess the quality of medical examination and treatment services at non-public hospitals through the satisfaction levels of residents in Hanoi City. The study aims to identify the crucial factors that influence people's satisfaction, thereby providing a scientific and practical foundation for hospital administrators to develop strategies that enhance service quality, increase competitiveness, and effectively serve the public in today's increasingly dynamic and competitive healthcare market.

2. Literature review and hypothesis development

2.1. Medical examination and treatment services quality

Service constitutes an activity that is directed towards the exchange of intangible products, which may or may not be associated with tangible goods (Kotler & Keller, 2009). It entails the creation of value to fulfill customer needs through specific behaviors or methodologies employed to execute a task (Zeithaml & Bitner, 2006).

Service quality refers to the extent to which a service meets the needs and expectations of customers, thereby satisfying their requirements (Edvardsson et al., 1994; Lewis and Mitchell, 1990). The research conducted by Parasuraman et al. (1985, 1988, 1991, 1994) identified service quality as the disparity between the outcomes delivered by the services rendered and the anticipated results by the customers. Parasuraman (1985) proposed that service quality comprises ten distinct dimensions: reliability, responsiveness, assurance, access, politeness, information, trust, security, empathy, and tangibles. Following extensive practical validation across various fields, the initial ten dimensions exhibited certain deficiencies in the measurement process. Consequently, Parasuraman (1988) refined the model to five dimensions of service quality: reliability, responsiveness, assurance, empathy, and tangibles, collectively referred to as the SERVQUAL model. This model is widely employed to assess service quality in numerous countries and across various sectors (Wang et al., 2005; Nguyen & Le, 2021).

- Reliability accurately reflects the level of service performance, adhering to the original agreements from the initial point of delivery
- Responsiveness reflects the degree of preparedness to serve customers and the capability to deliver services in a prompt, accurate, and timely manner
- Assurance demonstrates qualifications, professional capacity, and a friendly, polite, and courteous disposition among employees towards customers
- Empathy demonstrates a genuine concern and comprehension of the desires of each customer

- Tangibles represent the physical foundations, equipment, and outward appearance of employees dedicated to serving customers.

Moreover, Cronin and Taylor (1992) characterize service quality as the customer's perception of the service rendered, asserting that the actual experiential factors encountered during the utilization of the service serve as more effective evaluative instruments for assessing service quality. Therefore, they have proposed the SERVPERF model to measure service quality based on the five dimensions of the SERVQUAL model. It is simpler and has greater exploratory capacity because it relies solely on the level of customer perception when using the service, neglecting the expected value, which is difficult to measure and incurs high time and cost (Bolton & Drew, 1991; Babakus & Boller, 1992; Hartline & Ferrell, 1996).

Thus, service quality refers to the customer's perception or evaluation of the service provided, which is distinctly different from what the service provider advertises. Based on the above views, the quality of medical examination and treatment services is what people use to judge the overall process or dimensions of the medical examination and treatment services provided at non-public hospitals.

2.2. People's satisfaction

The study of Kotler (2005) shows that customer satisfaction is a state of customer feeling that stems from comparing the results obtained from the product with their own expectations. Customer satisfaction is the level of evaluation from the customer about a product, good or service that has met their own needs and expectations. Simultaneously, customer satisfaction is a positive emotional reaction of customers about their experience with a product, good or service. According to Oliver (1993), Zeitham and Bitner (2000), Kotler and Keller (2006), customer satisfaction is the feeling obtained from the customer's own side when comparing the results received with their expectations before using that product or service. Satisfaction appears if the results received are equal to or higher than expectations. Thus, customer satisfaction is a variation in psychological state that expresses positive emotions about the products, goods or services they have used.

Furthermore, concerning customer satisfaction, several prior studies have introduced two distinct concepts of customer satisfaction: immediate satisfaction and long-term satisfaction that is characterized by recurring experiences (Andersen, 2000). Immediate satisfaction is derived directly from the service received or customer feedback after utilization (Oliver, 1997). Conversely, long-term satisfaction encompasses repeated experiences, wherein overall satisfaction is informed by the gradual accumulation of experiences over an extended period during the process of purchasing and utilizing services (Fornell et al., 1996). According to Wang (2004), long-term satisfaction is cited more frequently than immediate satisfaction due to its ability to prognosticate future customer intentions, particularly in terms of assessing an enterprise's capability to deliver products, goods, or services. In the context of this study, people's satisfaction is long-term satisfaction, which is manifested through a relaxed,

enjoyable, and positive disposition following numerous instances of utilizing medical examination and treatment services offered at non-public hospitals.

2.3. The relationship between the quality of medical examination and treatment services and people's satisfaction

From the viewpoint of service providers, service quality is customer satisfaction. Nonetheless, numerous studies in recent years have demonstrated that customer satisfaction and service quality are distinct yet interrelated concepts. Service quality reflects a type of attitude, representing a comprehensive long-term assessment, while satisfaction measures a particular transaction. Moreover, service quality affects customer satisfaction. Customer satisfaction is a general concept that refers to how satisfied customers feel when consuming a service, while service quality specifically addresses the attributes of the service provided. Studies in various fields by Cronin and Taylor (1992), Brady and Cronin (2001), Nguyen (2006), Wilson et al. (2008); Chen et al. (2011), Ahuja et al. (2011), Soita (2012), Nguyen and Le (2021) have affirmed that the two concepts of service quality and customer satisfaction exhibit certain similarities, yet they are distinctly differentiated in essence. Simultaneously, service quality is an important factor that directly impacts customer satisfaction. When customers perceive the service as high-quality through their usage, they will feel genuinely satisfied with the service provided. Based on the above arguments, a relationship exists between the quality of medical services and people's satisfaction when using medical examination and treatment services offered at non-public hospitals. The better the quality of medical examination and treatment services, the greater the satisfaction among people, and vice versa. The quality of these services serves as a criterion for evaluating the ranking of non-public hospitals based on people's satisfaction.

2.4. Research model and hypothesis

The research model inherits aspects of service quality from the SERVPERF model of Cronin and Taylor (1992) and incorporates the price factor (corresponding to the hospital fee) proposed by Zeitham and Bitner (2000). Additionally, we integrate relevant domestic and foreign studies, such as those by Nguyen (2011), Phung and Tran (2012), Kamyar et al. (2014), Le and Do (2014), Nguyen et al. (2021), and Chau et al. (2024). By reviewing the results of these studies, we select important factors that influence people's satisfaction with the quality of medical examination and treatment services at non-public hospitals across various localities, alongside factors that align with the research context and objectives. The proposed research model is as follows:

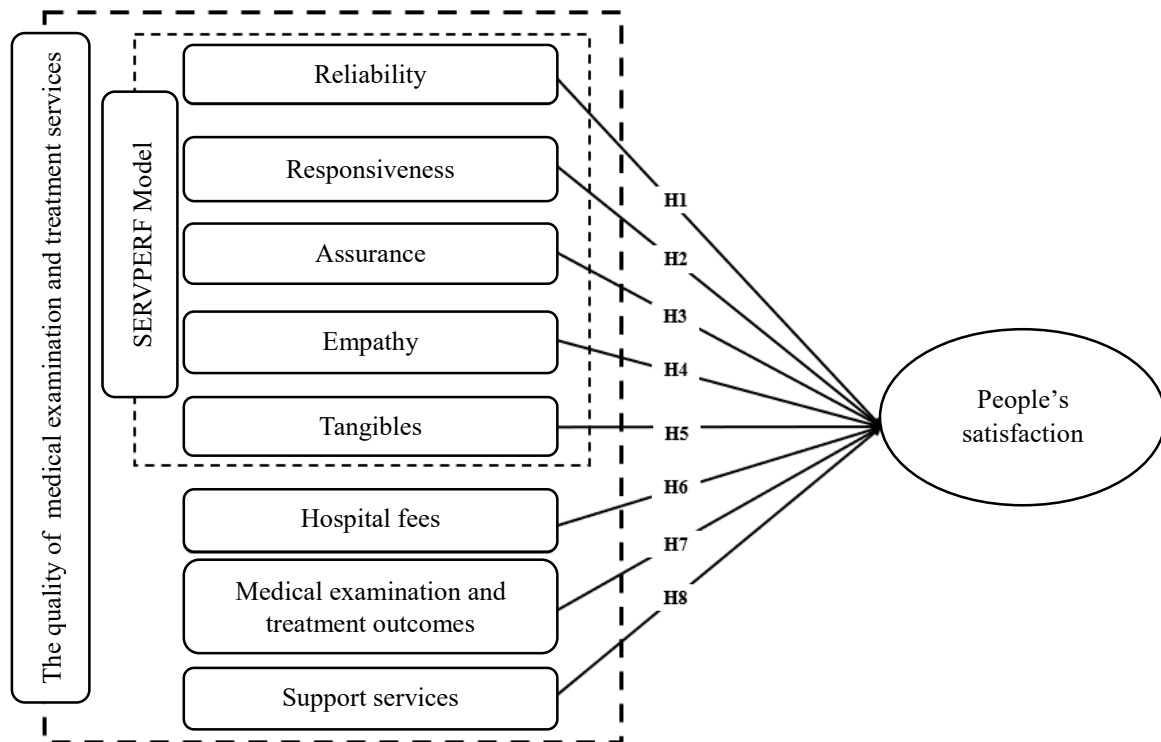


Figure 1: Research model

Source: Recommended by the author

The proposed research hypotheses are as follows:

H1: Reliability will be positively associated with people's satisfaction regarding the quality of medical examination and treatment services at non-public hospitals.

H2: Responsiveness will be positively associated with people's satisfaction regarding the quality of medical examination and treatment services at non-public hospitals.

H3: Assurance will be positively associated with people's satisfaction regarding the quality of medical examination and treatment services at non-public hospitals.

H4: Empathy will be positively associated with people's satisfaction regarding the quality of medical examination and treatment services at non-public hospitals.

H5: Tangibles will be positively associated with people's satisfaction regarding the quality of medical examination and treatment services at non-public hospitals.

H6: Hospital fees will be positively associated with people's satisfaction regarding the quality of medical examination and treatment services at non-public hospitals.

H7: Medical examination and treatment outcomes will be positively associated with people's satisfaction regarding the quality of medical examination and treatment services at non-public hospitals.

H8: Support services will be positively associated with people's satisfaction regarding the quality of medical examination and treatment services at non-public hospitals.

3. Methodology

3.1. Measurement scales

The preliminary scale is derived from the SERVPERF model as articulated by Cronin and Taylor (1992). Consequently, the author engaged in group discussions with several medical professionals and staff from various private hospitals in Hanoi City. Simultaneously, the author conducted interviews with experts in hospital management and medical administration to gather insights and evaluate the factors and elements necessary for comparing the theoretical framework to practical realities, specifically relating to the factors in the proposed research model. This evaluation serves as a foundation for adjusting the observed variables in the preliminary scale to align with the particularities of the medical sector, the study subjects, and the research context. The formal scale is constructed based on the consensus opinions of the participating members, a process that is scheduled to occur in August 2024.

The results indicate that the members concurred with the proposed research model and the preliminary scale. It is essential to incorporate additional observation variables into the factor scale to accurately convey the content, mitigate potential misunderstandings among survey participants, and refine the terminology to align with the medical field. Moreover, the proposed scale for measuring individuals' satisfaction is founded upon the consensus of experts and includes six observation variables. The formal scale is evaluated using a five-point Likert scale, ranging from Level 1 - Very Disagree to Level 5 - Strongly Agree.

3.2. Sample and data collection

The sample size was determined based on an optimal ratio of 10:1 in accordance with the guidelines set forth by Hair et al. (2010) for exploratory factor analysis (EFA). To ensure the reliability of the data obtained, the author disseminated a total of 550 questionnaires, aiming to achieve the desired quantity of responses. The survey was conducted over a period from October to December 2024, utilizing a convenient non-probability sampling method which facilitated prompt access to participants via both direct and online means at non-public hospitals located in Hanoi city. After excluding invalid responses, the number of valid questionnaires amounted to 386, yielding a response rate of 70.2%. Of the respondents surveyed, 40.9% identified as male and 59.1% as female. Notably, Vietnamese individuals continue to prioritize the utilization of health insurance, with a rate of 55.4%. However, the frequency of service visits is also significantly high, suggesting a growing demand for improved services. A substantial majority of respondents are married, representing 63%, and they tend to maintain more stable healthcare access. The demographic of survey respondents predominantly falls between the ages of 26 and 55 years (74.2%), constituting the primary working age group, characterized by regular income and access to healthcare. Interestingly, respondents possessing a relatively high level of education, specifically those who graduated from universities or higher educational institutions, accounted for 73.8%, thereby leading to increased expectations for service quality. Furthermore, the respondents surveyed exhibit considerable diversity in occupational categories, with entrepreneur and various other professions comprising a significant proportion (58.3%). Lastly, respondents with moderate to above-average income constitute a substantial segment (66.3%), aligning with the affordability of medical examination and treatment services covered by insurance plans and other services (see Table 1).

Table 1: Demography of survey respondents

Characteristics	N	Ratio	Characteristics	N	Ratio
Gender			Education		
Male	158	40.9	High school	101	26.2
Female	228	59.1	College graduate	216	55.9
Types			Postgraduate	69	17.9
Medical insurance	214	55.4	Profession		
Service	172	44.6	Entrepreneur	95	24.6
Marriage status			Civil servants	83	21.5
Single	143	37.0	Students	46	11.9
Married	243	63.0	Famer	32	8.3
Age			Others	130	33.7
< 25	64	16.6	Income		
26-35	121	31.3	< 5 million VND	84	21.8
36-45	98	25.4	5 – 10 million VND	149	38.6
46-55	67	17.4	10 – 20 million VND	107	27.7
> 56	36	9.3	> 20 million VND	46	11.9

Source: Data from authors' survey

3.3. Data analysis

The collected data were processed by SPSS26 software including analysis techniques: Cronbach's Alpha, exploratory factor analysis (EFA) and Logistics binary regression analysis to check the suitability of the research model. The Binary Logistics regression model is written in the form of an equation as follows:

$$\text{LOG} \left(\frac{P^*(Y=1)}{P^*(Y=0)} \right) = a + b \cdot X1 + c \cdot X2 + d \cdot X3 + e \cdot X4 + f \cdot X5 + g \cdot X6 + h \cdot X7 + i \cdot X8$$

Trong đó:

Y (Dependent variable): people's satisfaction regarding the quality of medical examination and treatment services (Y = 1 is satisfied; Y = 0 is dissatisfied).

X1...X8: independent factors in the proposed research model

a: constant

b, c, d, e, f, g, h, i: coefficient of independent factors on the dependent factor.

4. Findings and discussion

4.1. Findings

The results of the analysis in Table 2 show that the Cronbach's Alpha coefficient for independent and dependent factors is greater than 0.7, and it is also greater than the Cronbach's Alpha if item Deleted. Simultaneously, the corrected item-total correlation coefficient, which has a value greater than 0.4, represents a formal scale achieved reliability and discriminant validity (Hair et al., 2010).

Table 2: Cronbach's Alpha and EFA of independent and dependent factors

Variables	Sign	Cronbach's Alpha	Loadings	Source
Reliability (Mean = 3.91)				
I have confidence in the results of the diagnosis and the treatment regimen	X11	0.818	0.805	Parasunraman (1988), Nguyen (2011), Chau et al. (2024), Author
Doctors and medical staff do not make mistakes when treating patients	X12		0.791	
The quality of medical examination and treatment services is provided as announced	X15		0.783	
The medical examination and treatment process is conducted according to the procedure, with care and precision	X14		0.774	
Doctors and medical staff perform medical examinations and treatments exactly as recorded in the medical records	X13		0.769	
Responsiveness (Mean = 3.83)				
Doctors and medical staff are always willing to listen to and answer patients' questions	X22	0.836	0.826	Parasunraman (1988), Nguyen (2011), Chau et al. (2024), Author
Doctors and medical staff always inform about the exact time of medical examinations and treatments	X23		0.812	
Doctors and medical staff always care about every patient they treat	X21		0.807	
Comprehensive and prompt medical examination and treatment services for patients	X24		0.794	
Doctors and medical staff are always prepared to meet patients when needed	X25		0.780	
Assurance (Mean = 3.75)				

Variables	Sign	Cronbach's Alpha	Loadings	Source
Doctors and medical staff are always approachable, friendly, and foster trust with patients	X33	0.822	0.810	Parasunraman (1988), Nguyen (2011), Chau et al. (2024), Author
I have complete confidence in medical examinations and treatments	X31		0.801	
Doctors and medical staff are always knowledgeable and skilled in their expertise	X32		0.787	
Doctors and medical staff can identify and determine the causes of diseases for patients	X34		0.766	
Empathy (Mean = 3.89)				
Doctors and medical staff are always ready to examine, treat, and serve each patient	X41	0.796	0.783	Parasunraman (1988), Nguyen (2011), Chau et al. (2024), Author
Doctors and medical staff are always compassionate and understand the wishes and needs of their patients	X43		0.761	
Doctors and medical staff are always prepared for medical examinations and treatments in all circumstances and at all times	X42		0.749	
Tangibles (Mean = 4.17)				
The medical examination and treatment area is consistently hygienic and clean	X52	0.787	0.779	Parasunraman (1988), Nguyen (2011), Chau et al. (2024), Author
The clothing of doctors and medical staff is always neat and professional	X53		0.764	
I was impressed by the hospital's facilities	X55		0.753	
Comprehensive and modern medical examination and treatment equipment	X51		0.748	
The number of hospital beds sufficiently accommodates the patients requiring examination and treatment	X54		0.727	
Hospital fees (Mean = 3.93)				
The cost of examination and treatment is relatively fair	X62	0.829	0.808	Zeitham and Bitner (2000); Nguyen et al. (2021), Author
The cost of testing is relatively reasonable	X63		0.793	
The cost of the drug is relatively reasonable	X61		0.786	
The cost of food is relatively reasonable	X65		0.772	

Variables	Sign	Cronbach's Alpha	Loadings	Source
Non-public hospitals accept insurance cards	X64		0.765	
Medical examination and treatment outcomes (Mean = 4.03)				
The results of the medical examination and treatment are consistent with the symptoms present	X71	0.778	0.763	Chau et al. (2024), Author
Precise medical examination and treatment results, along with a specific treatment regimen	X72		0.755	
The results of medical examinations and treatments are similar to those of other hospitals	X74		0.741	
The results of medical examinations and treatments are carefully stored in the medical record	X73		0.738	
Support services (Mean = 3.88)				
Personal items are available.	X82	0.806	0.790	Nguyen et al. (2021), Author
Complete range of medical supplies	X84		0.771	
Able to provide sufficient medications	X81		0.767	
Complete catering service	X83		0.753	
KMO = 0.811				
Bartlett's Test	Approx. Chi-Square		10215.487	
	df		456	
	Sig.		0.000	
% of Variance		79,865		
People's satisfaction (Mean = 3.93)				
I am pleased with the facilities and equipment	Y3	0.827	0.817	Phung and Tran (2012), Kamyar et al. (2014), Author
I am pleased with the attitude and manner of serving	Y2		0.804	
I am satisfied with the medical examination and treatment process	Y4		0.791	
I will visit regularly for medical examination and treatment	Y5		0.785	
I will refer my friends for medical examinations and treatment	Y1		0.776	
Overall, I am satisfied with the quality of medical examination and treatment services	Y6		0.751	
KMO = 0.809				
Barlett's Test		Approx. Chi-Square		389.149

Variables	Sign	Cronbach's Alpha	Loadings	Source
		df		6
		Sig.		0.000
% of Variance		80.154		

Source: Data from authors' survey

Performing exploratory factor analysis (EFA) of independent factors using Principal Components Analysis (PCA) and Varimax rotation reveals that the KMO coefficient is 0.811, satisfying the requirements of being less than 1 and greater than 0.5. The Bartlett Test's Chi-square statistic reaches a value of 10215,487 with a significance of 0.000 (less than 0.05). With an Eigenvalue greater than 1, the factor analysis extracted eight groups of factors accounting for a total variance of 79.865% (greater than 50%), which indicates that 79.865% of the variation in the data is explained by eight factors. Additionally, the factor loadings of the observed variables are greater than 0.5, ensuring that the data included in the exploratory factor analysis is of good quality (Hair et al., 2010). For the dependent factor, the exploratory factor analysis (EFA) also met the conditions recommended by Hair et al. (2010) with a KMO coefficient of 0.809 and a significance level for Bartlett's test below 0.05. With an Eigenvalue greater than 1, 6 observed variables were grouped together, and the factor loadings exceeded 0.5, demonstrating that the data included in the analysis is appropriate and meets the established conditions (Hair et al., 2010) (see Table 2).

Table 3: Pearson Correlation and VIF

	Y	X1	X2	X3	X4	X5	X6	X7	X8	VIF
Y	1									
X1	0.711*	1								1.699
X2	0.692*	0.189*	1							1.804
X3	0.734*	0.205*	0.236*	1						1.825
X4	0.778*	0.310*	0.179*	0.289*	1					1.761
X5	0.659*	0.294*	0.205*	0.185*	0.241*	1				1.740
X6	0.703*	0.178*	0.276*	0.174*	0.185*	0.266*	1			1.836
X7	0.680*	0.195*	0.194*	0.317*	0.176*	0.231*	0.194*	1		1.792
X8	0.721*	0.227*	0.185*	0.268*	0.218*	0.258*	0.217*	0.188	1	1.813

** significant at $p < 0.05$; ** significant at $p < 0.01$*
Notes: Y = People’s satisfaction, X1 = Reliability, X2 = Responsiveness, X3 = Assurance, X4 = Empathy, X5 = Tangibles, X6 = Hospital fees, X7 = Medical examination and treatment outcomes, X8 = Support services

Source: Data from authors’ survey

To check the suitability of the factors before including them in the regression analysis, the results of Pearson correlation analysis indicated a strong correlation between the independent factor and the dependent factor, with a correlation coefficient greater than 0.5 and a Sig. value less than 0.05. Additionally, among the independent factors, there is no doubt regarding the presence of multicollinearity. It is clearly confirmed that the VIF (Variance Inflation Factor) indicates satisfactory conditions (less than 2 and greater than 1) and that the tolerance is greater than 0.5. Therefore, the factors are appropriate for inclusion in the regression analysis, and no multicollinearity is present.

Conduct a Binary Logistics analysis to estimate the impact of independent factors on dependent factors. Binary Regression uses binary dependency to estimate the probability that an event will occur based on the identified information from the independent factor. By analyzing the data available from both dependent and independent factors, it is possible to predict when people will express satisfaction with the quality of medical examination and treatment services at non-public hospitals in Hanoi city. The dependent factor takes on two values, 1 and 0, for individuals who are satisfied with the quality of medical examination and treatment services at non-public hospitals and, conversely, for those who are not satisfied.

Table 4: Model summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	36.178	0.735	0.791

Source: Data from authors’ survey

The analysis results indicate that the significance value of the Chi-square test is equal to 0.000, thereby satisfying the criterion of being less than 0.05. The -2 log-likelihood (-2LL) value of the Block 1 model is 36.178, which is 116.578 units smaller than the -2LL value of the Block 0 model, demonstrating that the model is statistically significant (Field, 2009). Furthermore, the Cox & Snell R Square coefficient of 0.735 and the Nagelkerke R Square coefficient of 0.791 both fulfill the criteria of being greater than 0 and less than 1 (Cox and Snell, 1989; Nagelkerke, 1991). Consequently, the regression model exemplifies a perfect fit.

Table 5: Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp (B)
Step 1 ^a	X1	0.329	0.010	1.744	1	0.001	1.389
	X2	0.287	0.017	2.309	1	0.000	1.332

	X3	0.381	0.028	1.426	1	0.002	1.464
	X4	0.203	0.016	1.512	1	0.000	1.225
	X5	0.252	0.025	1.238	1	0.004	1.286
	X6	0.356	0.038	2.105	1	0.000	1.428
	X7	0.304	0.012	1.643	1	0.000	1.355
	X8	0.238	0.026	2.288	1	0.003	1.269
	Constant	5,137	0.154	1.076	1	0.000	0.001
<i>Notes: X1 = Reliability, X2 = Responsiveness, X3 = Assurance, X4 = Empathy, X5 = Tangibles, X6 = Hospital fees, X7 = Medical examination and treatment outcomes, X8 = Support services</i>							

Source: Data from authors' survey

The analysis results indicate that the Sig value of the Chi-square test in the Model row is equal to 0.000, satisfying the condition of being less than 0.05. Additionally, the level of forecast accuracy is relatively high, with the overall model achieving a correct prediction percentage of 97.8%. It confirms that the independent factors included in the Logistic binary regression model all influence the dependent factor. The Wald test reveals that independent factors have a Sig coefficient of less than 0.05, reaffirming the correlation between independent and dependent factors.

Furthermore, the degree of influence of independent factors on the dependent factor is expressed by the Exp value (B), which indicates the likelihood of the dependent factor receiving a value of 1. When the independent factors from X1 to X2 increase by 1 unit, the dependent factor also rises to 1,389, 1,332, 1,464, 1,225, 1,286, 1,428, 1,355, and 1,269 units. Therefore, the hypotheses put forward are accepted and have a positive effect on the dependent factor. Based on the regression coefficient in the result table, the Binary Logistic regression equation is written as follows:

$$\text{LOG} (P*(Y=1)/ P*(Y=0)) = 5,137 + 0.381*X3 + 0.356*X6 + 0.329*X1 + 0.304*X7 + 0.287*X2 + 0.252*X5 + 0.238*X8 + 0.203*X4$$

4.2. Discussion

The findings derived from the evaluation of the research model indicated that eight factors exert a positive influence on people's satisfaction regarding the quality of medical examination and treatment services offered at non-public hospitals within Hanoi city. These factors are ranked in descending order as follows: assurance, hospital fees, reliability, medical examination and treatment outcomes, responsiveness, tangibles, support services, and empathy.

Table 6: Hypothesis test

Hypothesis	Describe	Conclude	Hierarchy
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H1	Reliability will be positively associated with people's satisfaction regarding the quality of medical examination and treatment services at non-public hospitals	Supported	3
H2	Responsiveness will be positively associated with people's satisfaction regarding the quality of medical examination and treatment services at non-public hospitals	Supported	5
H3	Assurance will be positively associated with people's satisfaction regarding the quality of medical examination and treatment services at non-public hospitals.	Supported	1
H4	Empathy will be positively associated with people's satisfaction regarding the quality of medical examination and treatment services at non-public hospitals	Supported	8
H5	Tangibles will be positively associated with people's satisfaction regarding the quality of medical examination and treatment services at non-public hospitals	Supported	6
H6	Hospital fees will be positively associated with people's satisfaction regarding the quality of medical examination and treatment services at non-public hospitals	Supported	2
H7	Medical examination and treatment outcomes will be positively associated with people's satisfaction regarding the quality of medical examination and treatment services at non-public hospitals	Supported	4
H8	Support services will be positively associated with people's satisfaction regarding the quality of medical examination and treatment services at non-public hospitals	Supported	7

Source: Data from authors' survey

Furthermore, a descriptive analysis indicates that the level of satisfaction among people exceeded 3 points, with tangible factors exhibiting the highest mean score of 4.17. This was followed by mean scores for medical examinations and treatment outcomes at 4.03, hospital fees at 3.93, reliability at 3.91, empathy at 3.89, support services at 3.88, responsiveness at 3.83, and assurance at 3.75.

The research model systematically examined the disparities between demographic factors and people's satisfaction with the quality of medical examination and treatment services at non-public hospitals using the One-way ANOVA and One-Sample T-Test methodologies.

The findings indicate that demographic variables such as gender, marital status, age, education level, and occupation did not exhibit significant differences. Conversely, two factors, specifically types and income, demonstrated notable distinctions. Notably, the quality of medical examination and treatment services associated with health insurance remains inadequate, resulting in lower satisfaction levels compared to those without insurance. Additionally, individuals across varying income levels, particularly those in lower income brackets, tend to express higher satisfaction regarding the quality of medical examination and treatment services at non-public hospitals.

Consequently, a higher level of satisfaction among people is observed when the quality of medical examination and treatment services provided by non-public hospitals is optimized to the highest standards. This outcome mirrors the findings of previous research that employed the SERVQUAL and SERVPERF scales to assess service quality satisfaction within the medical domain (Nguyen, 2011; Phung & Tran, 2012; Kamyar et al., 2014; Le & Do, 2014; Le et al., 2014; Nguyen et al., 2021; Chau et al., 2024), as well as in other sectors (Nguyen, 2006; Wilson et al., 2008; Chen et al., 2011; Ahuja et al., 2011; Soita, 2012; Nguyen & Le, 2021). This study further substantiates the assertion that the SERVQUAL and SERVPERF theoretical frameworks are appropriate for evaluating customer satisfaction across various fields. The distinction of this study lies in its implementation of the binary logistics regression method to assess people's satisfaction with the quality of medical examination and treatment services provided at non-public hospitals. Additionally, the hierarchy of influence regarding the quality factors of medical examination and treatment services varied among various subjects, as well as the time and location of the study. However, the limitations of this study include the use of the legacy model, its simplicity, a small sample size, and the convenience sampling method employed, which focuses on a single geographical area, which limits the generalizability of the findings. Furthermore, the research model requires consideration of additional factors that may affect the relationships examined. These limitations also present opportunities for further research for the author.

5. Implications

Firstly, hospitals must prioritize continuous training and the development of expertise, communication, and behavioral skills among the medical team. Simultaneously, hospitals should cultivate a professional and amicable working environment, thereby creating conditions that allow employees to optimize their professional capabilities. Furthermore, the establishment of patient care procedures in accordance with international standards will enhance treatment efficacy while simultaneously fostering trust among the populace.

Secondly, hospitals ought to establish a transparent and publicly accessible service price list. Concurrently, it is advisable to collaborate with insurance providers in order to enhance flexible payment policies. This initiative aims to alleviate the financial burden on patients, thereby reinforcing trust and promoting access to high-quality medical services.

Thirdly, it is imperative to enhance the reliability of medical examinations and treatments by instituting a stringent quality control process that encompasses all stages from reception, diagnosis, treatment, to post-inspection. Ensuring accurate test results, diagnoses, and treatment regimens from the outset will significantly bolster patients' trust in the quality of services provided by the hospital.

Fourth, one should emphasize the enhancement of medical examination and treatment outcomes by investing in contemporary medical equipment, implementing advanced treatment methodologies, and cultivating a team of highly skilled medical professionals to optimize the efficiency of medical examinations and treatments. The outcomes of treatments serve as the most evident indicators of quality, thereby influencing the likelihood of patient return and referrals.

Fifth, hospitals should develop a well-structured patient reception process, enhance the consulting team, provide round-the-clock support, and implement technology for managing medical records and scheduling appointments in order to reduce patient waiting times.

Sixth, it is imperative for hospitals to invest concurrently in physical infrastructure, contemporary facilities, hygienic medical examination and treatment environments, state-of-the-art medical equipment, and to cultivate a professional image of the staff in order to enhance the experience and satisfaction of patients during the medical examination and treatment process.

Seventh, enhance additional support services by ensuring a complete supply of medical supplies, medications, catering services, and patient care facilities. It will help patients feel secure, comfortable, and satisfied throughout their treatment period.

Eighth, it is essential to enhance empathy in patient care by cultivating a culture that prioritizes understanding, active listening, and committed care. Such an approach aids in ensuring that patients perceive the intrinsic value of humanity and respect within medical services, ultimately resulting in increased levels of satisfaction and emotional attachment.

6. Conclusion

Assessing people's satisfaction regarding the quality of medical examination and treatment services, particularly in non-public hospitals, constitutes a significant concern. Currently, non-public hospitals form the backbone of Vietnam's healthcare system, providing essential health services at a minimal cost. Despite the critical achievements of non-public hospitals, considerable limitations and deficiencies persist in their medical service delivery, impairing operational effectiveness. Consequently, this study aims to explore the extent to which the various components of medical examination and treatment service quality influence people's satisfaction within non-public hospitals. The proposed research model outlines these quality components about the specific realities faced by these institutions. The findings of this study will equip managers at all levels with valuable insights into the elements that directly

affect people's satisfaction, enabling them to devise targeted improvement solutions informed by people's feedback.

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