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The Impact of Medical Service Quality and Brand on Brand Equity in Private Hospitals in China: Patient Involvement as a Moderator of the Relationship

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Doctor of Management

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ISCTE University Institute of Lisbon
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Southern Medical University

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Abstract

In recent years, with the rapid development of China's economy and the growing demand for healthcare, the medical industry has faced increasingly fierce market competition. While private hospitals meet the health service needs of middle- and high-income groups, they also encounter challenges in enhancing brand equity. Existing studies have shown that service quality, brand image, brand awareness, and brand loyalty significantly influence brand equity in private hospitals. However, the moderating role of patient involvement remains underexplored.

This study, grounded in the context of private hospitals, focuses on core factors such as service quality and brand image, aiming to reveal their mechanisms of influence on brand equity and to explore the moderating effect of patient involvement. Using literature review, questionnaire surveys, and statistical analysis, a conceptual model was developed based on the health human capital theory and consumer-based brand equity theory. Regression and AMOS analyses were conducted to test hypotheses and examine moderating effects.

Data were collected from private hospital patients using convenience sampling. A total of 710 valid questionnaires were obtained. The results show that service quality, brand image, and brand loyalty positively affect brand equity, while brand awareness has no significant impact. Patient involvement enhances the influence of all variables, including brand awareness. This study provides practical insights for improving brand equity in private hospitals and highlights the importance of patient involvement for sustainable brand development.

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Resumo

Nos últimos anos, com o rápido desenvolvimento econômico da China e o aumento da demanda por saúde, o setor médico enfrenta uma concorrência de mercado cada vez mais acirrada. Os hospitais privados, embora atendam às necessidades de saúde da população de média e alta renda, enfrentam desafios para fortalecer seus ativos de marca. Estudos anteriores indicam que a qualidade dos serviços, imagem da marca, notoriedade e lealdade exercem impactos significativos sobre os ativos de marca, mas o papel moderador do envolvimento dos pacientes ainda é pouco explorado.

Com base no contexto dos hospitais privados, este estudo foca na qualidade dos serviços e imagem da marca, buscando revelar seu impacto sobre os ativos de marca e explorar o efeito moderador do envolvimento dos pacientes. Utilizam-se métodos de revisão bibliográfica, pesquisa por questionário e análise estatística. Na parte teórica, propõe-se um modelo com base na teoria do capital humano em saúde e na teoria do valor da marca do consumidor; na parte empírica, testes com regressão e AMOS analisam a moderação do envolvimento do paciente.

A coleta de dados foi realizada em hospitais privados, com 710 questionários válidos obtidos por amostragem conveniente. Os resultados mostram que a qualidade dos serviços, imagem da marca e lealdade influenciam positivamente os ativos de marca; a notoriedade não tem efeito significativo. O envolvimento dos pacientes intensifica todos esses efeitos. O estudo contribui para estratégias de valorização de marca em hospitais privados e destaca a importância de promover maior envolvimento dos pacientes.

Palavras-chave: Hospitais privados, Qualidade dos serviços, Ativos de marca, Envolvimento dos pacientes
JEL: L84; M31

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摘 要

近年来，随着中国经济快速发展和居民健康需求的逐步提升，医疗行业面临日益激烈的市场竞争。私立医院在满足中高收入人群健康服务需求的同时，也面临着品牌资产提升的诸多挑战。现有研究发现，私立医院医疗服务质量、品牌形象、品牌知名度和品牌忠诚度对其品牌资产具有显著影响，但患者卷入度在这一过程中发挥的调节作用尚未被充分探讨。因此，本研究基于私立医院行业背景，聚焦服务质量和品牌形象等核心因素，试图揭示其对品牌资产的影响机制，并探索患者卷入度在其中的调节效应。

本文采用文献研究法、问卷调查法和统计分析法，通过理论构建和实证分析，探讨私立医院医疗服务质量、品牌形象、品牌知名度和品牌忠诚度对品牌资产的作用路径。在理论构建部分，研究基于健康人力资本理论和消费者品牌资产理论提出假设模型；在数据分析部分，通过回归分析和AMOS验证假设，深入探讨患者卷入度在各变量关系中的调节作用。数据采集主要面向私立医院患者，以确保结果的实践相关性和推广价值。问卷采用便捷抽样法，在医院现场由研究人员引导患者使用手机扫描二维码填写问卷，最终共得到710份问卷。

研究表明，医疗服务质量、品牌形象和品牌忠诚度均对品牌资产有显著正向影响，品牌知名度对品牌资产不具有显著影响，而患者卷入度则能够显著增强以上所有变量（包含品牌知名度）对品牌资产的影响效应。本研究的意义在于为私立医院品牌资产提升提供了支撑，并强调了患者卷入度的重要性。通过优化服务质量、塑造良好品牌形象、提升品牌知名度和忠诚度，同时增强患者卷入度，私立医院能够实现品牌价值的持续增值和长期发展，为医疗行业的可持续竞争力提供了有益参考。

关键词：私立医院，服务质量，品牌资产，患者卷入度
JEL: L84; M31

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Time flies, and as my doctoral studies and research journey come to an end, I reflect on the challenges and achievements of this period. I have gained a profound appreciation for the depth of knowledge and the rigorous nature of academic pursuit. Equally, I have been deeply touched by the unwavering care and support of my family, mentors, and friends. With heartfelt gratitude, I extend my sincerest thanks to all those who have helped, encouraged, and supported me along the way.

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致　谢

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Chapter 1: Introduction

1.1 Research background

1.1.1 Current state of healthcare focus

In 2016, the Chinese government launched the "Healthy China 2030" initiative, emphasizing universal health through co-building and sharing. This framework has positioned brand equity as a critical goal for healthcare institutions. High-quality medical services now play a pivotal role in enhancing a hospital's market influence and competitiveness (Tian et al., 2023). With rising living standards and increased health awareness, public expectations from healthcare brands are escalating, demanding better services and pushing institutions to improve brand development. Technological advancements offer new opportunities for brand enhancement (Liu & Cai, 2022). Healthcare providers are increasingly using platforms like WeChat, Douyin, and Bilibili to engage directly with patients, garner feedback, and refine services, which helps bolster brand image despite the challenges of online medical services like diagnostic accuracy. As the significance of private hospitals grows within China's healthcare system, effective brand building, driven by superior service quality, is essential for boosting patient satisfaction, loyalty, and overall brand equity (Lin, 2019).

1.1.2 Current development status of the private hospital industry

In recent years, China's private hospital sector has grown significantly, spurred by government support, increasing market demand, demographic changes, and technological advancements (Wang et al., 2021). Government initiatives have relaxed market entry, encouraging private investment through incentives, thus boosting the healthcare quality and brand equity of these institutions. Economically, China's burgeoning middle class demands higher-quality, specialized healthcare services, aligning well with the offerings of private hospitals, which cater to these needs with better facilities and reduced wait times (Fong，2021). Additionally, an aging population requires more chronic disease management and eldercare, areas where private hospitals excel, further enhancing their brand image. Technological innovations, like advanced medical equipment and digital healthcare platforms, have also propelled the sector by improving service efficiency and personalization (Cham et al., 2020). However, challenges

persist, such as limited public trust and transparency issues in pricing and service quality, necessitating robust strategies to improve and sustain brand equity amidst a competitive landscape (Górska-Warsewicz, 2022).

1.1.3 Challenges in medical services in private hospitals

The medical services in private hospitals face a few challenges.

(1) Lack of public trust in private hospitals

First, some private hospitals damage public trust through excessive and misleading advertising and marketing, such as exaggerating medical outcomes or offering services beyond their actual capabilities (Zhao et al., 2022). This not only breaches medical ethics but also fosters distrust in the integrity of private hospitals.

Second, compared to public hospitals, there is often a regulatory gap or flexibility in private hospitals. Despite increasing government regulations, the enforcement and effectiveness of these regulations still need improvement (Alumran et al., 2021). This lack of effective oversight can lead to unstandardized medical practices, further affecting public trust.

(2) Lack of transparency in service quality and fee standards

The inconsistency in service quality is a key factor affecting public trust (Liu et al., 2021). The development of private hospitals in China is relatively recent, and their quality and service levels vary greatly. While some provide high-quality medical services that meet international standards, others may neglect the essence of medical services due to excessive commercialization, leading to widespread concerns about the quality of private hospitals (Aslam et al., 2021).

Moreover, the low transparency in pricing is also a major issue. Private hospitals generally charge more than public hospitals, and their fee standards vary, with some even involving hidden charges or excessive medical treatments (Li et al., 2021). This opaque pricing model makes patients uneasy and distrustful, unsure whether the services offered are based on medical necessity or profit-driven motives (Pu & He, 2016).

(3) Inadequate management of brand culture in private hospitals

Many private hospitals lack a long-term strategic plan for building brand culture (Schroeder et al., 2006). In China's rapidly developing medical market, some hospitals focus too much on short-term profit goals, neglecting the deep cultivation of brand culture (Aguerrebere et al., 2020). This shortsightedness leads to a superficial hospital culture, lacking core values and a sense of mission deeply integrated with medical services.

Furthermore, low employee engagement is another critical factor weakening brand culture

in private hospitals. Building a strong brand culture requires the participation and endorsement of all staff, but in some private hospitals, ineffective internal communication mechanisms and lack of motivational policies result in weak employee identification with the hospital's brand culture. This situation is detrimental to establishing unified service standards and conduct guidelines, affecting the overall service quality and patient experience (Srimulyani & Hermanto, 2022).

Third, private hospitals also face deficiencies in communicating their brand culture (Khoshakhlagh et al., 2019). Effective dissemination of brand values and cultural principles is essential not just through advertising and public relations but also in everyday operations. However, some private hospitals fail to effectively communicate their brand values internally and externally, leading to a vague public perception of the hospital brand and difficulty in forming a loyal patient base (Akob et al., 2021).

1.2 Motivation

As an essential component of healthcare services, the enhancement of brand equity in private hospitals is directly related to their market competitiveness and patient loyalty. In recent years, with the increasing public awareness of health, patients' recognition of healthcare institutions' brands has gradually strengthened. In particular, the performance of private hospitals in terms of service quality and brand image has a significant impact on their market position. However, private hospitals still face numerous challenges in improving their brand equity, such as insufficient public trust, a lack of pricing transparency, and deficiencies in brand culture management.

This study is dedicated to exploring how service quality and hospital branding collectively influence brand equity in private hospitals. With increasing competition in the healthcare market, private hospitals face the challenge of standing out amidst numerous homogenized services (Rodríguez et al., 2020). In this context, enhancing service quality and developing a strong brand are key to increasing the competitiveness of private hospitals. The research incorporates patient involvement as a significant moderating variable to examine its role in moderating the effects of service quality and brand image on brand equity (Al-Refaei et al., 2023). By analyzing how patient participation in the medical service process affects their perceptions of service quality and brand loyalty, this study aims to provide strategic recommendations for private hospitals to manage brand equity more effectively, thereby enhancing their market competitiveness.

As an essential component of the healthcare system, private hospitals meet the growing demand for healthcare services by enhancing service quality and brand visibility. The development of brand image, brand awareness, and brand loyalty not only fosters patient loyalty (Bernarto et al., 2020; Pandiangan et al., 2021) but also strengthens the hospital's competitive edge, enabling it to maintain a strong position in the highly competitive healthcare market. Moreover, driven by the distribution of medical resources, policy support, and advancements in technology, private hospitals are increasingly bridging the gap with patients through high-end and digital healthcare services, enhancing the convenience of service experiences and further solidifying brand image (Tian et al., 2019). Therefore, researching brand equity in private hospitals not only helps these institutions align more closely with the healthcare expectations of high-demand groups such as the middle class but also addresses public concerns regarding trust in private hospitals through the transmission of brand culture and values. This branding strategy enables private hospitals to achieve sustainable long-term growth, making the exploration of the impact of service quality and brand image on brand equity a topic of unique innovative value and practical significance.

1.3 Research questions

Based on the aforementioned research context, this study investigates the mechanisms through which service quality and branding in private hospitals impact brand equity, with a focus on the following three fundamental questions:

Question 1: Impact of Medical Service Quality. How can the impact of medical service quality on brand equity be accurately assessed and quantified? How do the various dimensions of medical service quality individually affect patients' decision-making processes?

Question 2: Role of Brand Impact. How do brand image, Brand Awareness and Brand loyalty in private hospitals influence patients' choices of where to seek treatment?

Question 3: Moderating Role of Patient Involvement. How does patient involvement (the degree of participation and information-gathering behavior by patients in the medical decision-making process) play a role in the mechanisms by which service quality and branding affect brand equity? Does varying levels of involvement lead to significant differences in brand equity?

1.4 Research goals

The main objective of this study is to identify the main determinants of brand equity in private hospitals. This study aims to identify and analyze how service quality and brand image impact brand equity in the provision of medical services by private hospitals. Through this research, the investigators seek to clarify the key dimensions of service quality and how brand image can independently and jointly influence brand equity. The core issue revolves around how enhancing service quality and strengthening brand image can augment brand equity in private hospitals, thereby offering clear strategic directions to management for optimizing service and brand management practices.

Brand equity in the actual operation of private hospitals can directly influence their market competitiveness, patient loyalty, and long-term sustainability. The strength of brand equity not only affects patients' trust and choices regarding hospitals but also determines the hospital's positioning and attractiveness in the market. Effectively enhancing brand equity contributes to increased patient satisfaction, strengthens the hospital's competitive advantage, and promotes the positive circulation of healthcare resources. Therefore, an in-depth investigation into the impact of service quality and brand image on brand equity can provide private hospitals with scientifically grounded brand management strategies, helping them achieve stable development in an increasingly competitive market.

The secondary research objectives evaluate the moderating role of patient involvement in the impact of service quality and brand image on brand equity. This goal supports the primary research objectives by analyzing how patient involvement influences their perceptions of service quality and brand image, thereby moderating these factors' effects on brand equity. The study will explore how different levels of patient involvement can alter the service quality and branding (including brand image and brand awareness) of private hospitals, offering concrete strategies for hospitals on how to further strengthen brand equity through patient involvement.

1.5 Research content and methods

1.5.1 Research contents

The research presented in this study primarily consists of the following sections:
    Chapter 1: Introduction

With the growing attention to healthcare, private hospitals, as key providers of medical services, face dual challenges of brand competition and service quality. This chapter introduces the research background, motivation, objectives, significance, and research methods.

Chapter 2: Literature Review

This chapter reviews relevant theories and research findings, covering the concepts and measurements of healthcare service quality, brand, patient involvement, and brand equity. Additionally, the chapter discusses the theory of human capital in health, relationship marketing theory, and consumer-based brand equity theory, while critically reviewing the existing literature to identify gaps and opportunities for further research.

Chapter 3: Hypotheses and Construction of Research Models

This chapter presents the research hypotheses and constructs the corresponding conceptual model. The hypotheses examine how healthcare service quality, brand image, brand awareness, and brand loyalty individually influence brand equity, and how patient involvement moderates these relationships. Through these hypotheses, this study aims to uncover the key factors and mechanisms in the formation of brand equity.

Chapter 4: Research Design

This chapter outlines the research design methods, including the selection of scales, questionnaire design, and the determination of the research sample. The study employs an empirical survey method, with a detailed questionnaire developed and pre-tested for validity and reliability. The data collection process involves the distribution and retrieval of the formal questionnaire to ensure a representative sample.

Chapter 5: Empirical Analysis

This chapter verifies the research hypotheses through data analysis. Descriptive statistics are first conducted, followed by reliability and validity tests to ensure the reliability and validity of the questionnaire data. Finally, regression analysis is used to explore the relationships among the variables and test the moderating effect of patient involvement between healthcare service quality and brand equity.

Chapter 6: Discussion of Results

This chapter discusses the results of the empirical analysis, focusing on the impact of healthcare service quality, brand image, brand awareness, and brand loyalty on brand equity. Particular attention is given to the moderating role of patient involvement in the relationships among these variables, analyzing its positive effects in enhancing brand equity and providing theoretical support for improving brand management.

Chapter 7: Research Conclusion and Prospects

This chapter summarizes the research conclusions, highlighting the contributions and innovations of this study, particularly in terms of management implications for enhancing private hospital brand equity. By improving healthcare service quality, shaping a positive brand image, enhancing brand awareness and loyalty, and increasing patient involvement, hospitals can effectively enhance their brand equity. The limitations of the research and future research directions are also discussed in this section.

1.5.2 Research method

(1) Literature review method

This study adopts the literature review method, extensively collecting and systematically organizing Chinese and international literature related to healthcare service quality, brand image, brand awareness, brand loyalty, brand equity, and patient involvement. Based on an in-depth understanding and analysis of the existing literature, this study proposes a theoretical model that includes healthcare service quality, brand image, brand awareness, brand loyalty, brand equity, and patient involvement. Furthermore, based on this model, the study formulates corresponding research hypotheses.

(2) Survey method

Data are gathered through field surveys using questionnaires, which are refined through preliminary research to ensure the reliability and validity of the measurement items. Surveys are conducted with patients in private hospitals to collect pertinent data. The questionnaire design is robust, covering aspects such as service quality, brand image, patient involvement, and brand equity to delve deeply into patients' perceptions of the hospital brand.

(3) Statistical methods

Statistical analysis software like SPS21.0 is utilized to process and analyze the collected data. Techniques such as correlation and regression analysis are employed to explore the relationships among medical service quality, brand image, patient involvement, and brand equity, thereby testing the research hypotheses and investigating the interplay between variables. Through statistical data analysis, the study reveals the correlations among relevant variables in private hospitals, providing objective data support for the research and substantiating the conclusions drawn.

Moreover, in order to test the robustness of the results, this study also tested the model using AMOS.

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Chapter 2: Literature Review

2.1 Systematic Literature review

The literature review followed a systematic approach using the followimg query (TITLE-ABS-KEY (hospital) OR TITLE-ABS-KEY (healthcare) AND TITLE-ABS-KEY ("brand equity")) AND (LIMIT-TO (SRCTYPE,"j")). A total of 58 papers were identified until the end on July 2024.

The analysis of the number of publications by year revelaed an increasing interest on hospital brand equity in the last years. More than hald of the papers were published before 2019.

The 58 papers were authored and co-authored by 146 schoolars. The most productive researchers in thos field are Mukherjee, S. (n=4) and Kim, K.H. (n=3). Fortheen authors wrote 2 papers and the remaing authors one paper. These authos are affiliated in 113 different institutions, namely Indian Institute of Technology Kharagpur (n=4), Changwon National University (n=3) and North Dakota State University (n=3). The most frequent key-words in the 58 papers are Brand (69), Equity (39), Marketing (21), Hospital (19), Service (18), Health (13), Social (11) and Healthcare (10).

Figure 2.1 Keyword Cloud

This study employs Leximancer for intertextual analysis, utilizing this software as a semantic network analysis tool capable of "quantifying and displaying the conceptual structure of texts." The reasons for selecting this software are manifold:

First, Leximancer features a user-friendly graphical interface that does not require programming skills. Users simply input the text according to prompts and adjust settings related to concept recognition, definition, and text categorization as needed. Leximancer's interface presents four stages of automated content analysis, arranged from left to right: selection and entry of the corpus, generation of concept seeds, construction of the concept lexicon, and generation of the concept map. Once the corpus is entered, researchers can directly generate the concept map by clicking the button for the fourth stage, or they can adjust settings for the latter three stages based on research objectives. The setting interface is located in the white boxes beneath the four generation buttons, where researchers complete the settings in one box before proceeding to the next stage, culminating in the generation of the concept map. The concept map and related research results can be accessed by clicking two buttons in the rightmost white box.

Second, Leximancer does not require pre-processing of the text before content analysis. "Tools like Mallet, topicmodels, Gensim, lda, and sklearn require additional code to format the source text" (Nune-Mir et al., 2016). Leximancer automatically recognizes and removes non-alphabetic characters and words that do not contribute to the text's meaning, such as studys, prepositions, and conjunctions, preparing for subsequent concept identification and easing the process for researchers.

Third, Leximancer is capable of identifying and measuring the relationships between concepts. Among the analytical tools mentioned earlier, only Leximancer and stm offer this feature, adding a layer of complexity beneficial for researchers interested in specific concepts rather than understanding the literature as a whole (Nune-Mir et al., 2016). This capability provides researchers with the relevant contexts of specific concepts, aiding in detailed concept analysis.

Fourth, Leximancer is the only tool among the aforementioned that allows the manual input of user-defined concepts. Typically, concept recognition is autonomously learned by the tool scanning the text, but in cases where needed concepts are too abstract or rare for automatic recognition, or when there are superfluous automatically recognized concepts, these issues can be effectively addressed through manual input.

Fifth, Leximancer can visualize research results. Among the tools that offer result visualization—Mallet, Leximancer, and stm—others only provide text co-occurrence matrices,

concept counts, and categorized text segments. Visualization of results provides a more intuitive display of the relationships between concepts and related themes, facilitating analysis for researchers, as shown in the following figure 2.2:
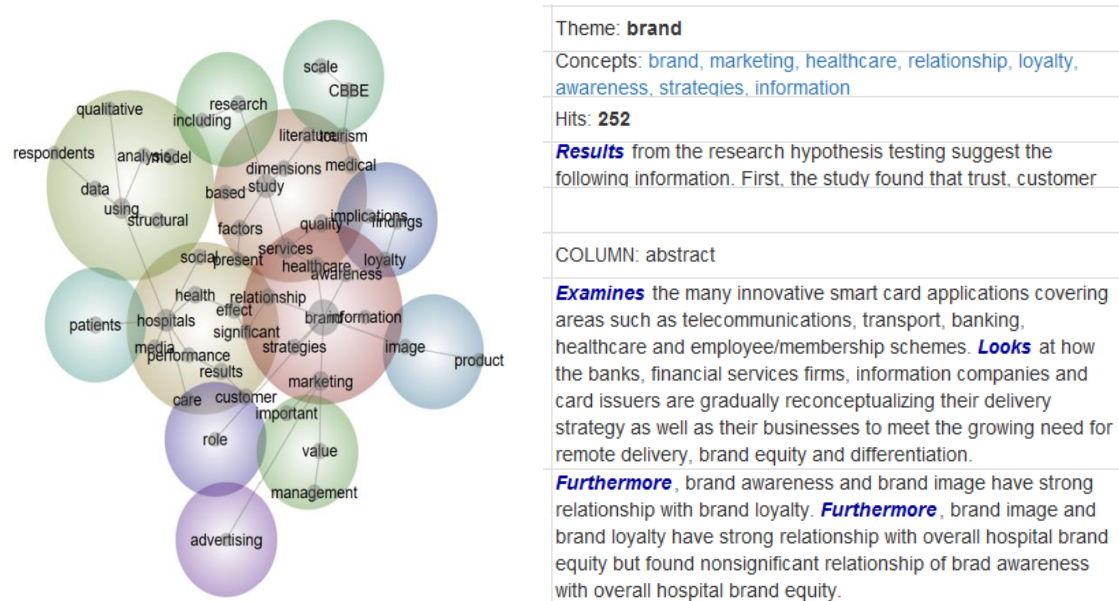
Figure 2.2 Leximancer visualization analysis results

Leximancer is a highly efficient text analysis tool widely utilized in semantic network analysis and intertextual studies. It is highly regarded in academic and industry settings due to its unique visualization capabilities and precise text-mining functionalities. By automating text analysis, Leximancer extracts latent concepts and themes from textual data and presents them as intuitive concept maps, enabling researchers to quickly comprehend the structure and underlying meaning of the content. This tool is particularly well-suited for handling large-scale text datasets, as it uncovers complex semantic relationships and thematic networks, providing researchers with a novel perspective for analysis.

The concept maps generated by Leximancer visually depict the relationships between concepts and thematic connections. Each concept is represented as a node, with the size of the node indicating the degree of connectivity of that concept within the text. Larger nodes signify higher connectivity, implying that the concept occupies a central position in the text and is strongly associated with other concepts. The importance of themes is conveyed through a color-coding system, with red representing the most significant themes and blue indicating less prominent ones. This hierarchical color distinction enables researchers to quickly identify the primary focus and core content of the text without the need for line-by-line reading, significantly enhancing analytical efficiency.

The structure of the concept map is both clear and hierarchical. Black text represents

specific concepts, while colored regions delineate distinct themes. Themes are typically named after the most connected concept within the text, offering an intuitive and accurate reflection of the theme's core content. Each theme's name is closely tied to the major concepts it encompasses, which are automatically extracted from the original text. Researchers can delve deeper into the thematic context through the accompanying theme view, which provides access to relevant text excerpts. These excerpts enable researchers to better understand the nuances of a theme and summarize its central meaning. For instance, a theme labeled "consumer behavior" may lead researchers to explore associated text blocks discussing consumer behavior patterns, influencing factors, or specific cases, thereby uncovering deeper insights.

Moreover, Leximancer incorporates the Hits metric to quantify the relevance and importance of themes. Hits values indicate the frequency of a theme's occurrence within the text and the volume of associated text fragments. Higher Hits values signify that a theme is more frequently mentioned and more strongly connected to the text, making it a focal point for further exploration.

The strength of Leximancer lies not only in its visual clarity but also in its ability to uncover text trends that are challenging to identify manually. By systematically processing textual data, researchers can easily detect hidden thematic patterns and concept relationships. The tool has demonstrated high reliability and validity in numerous studies (Biesenthal & Wilden, 2014; Randhawa et al., 2016; Smith & Humphreys, 2006).

In summary, Leximancer is a robust, scientifically rigorous text analysis tool that excels in theme discovery, intertextual analysis, and trend identification. By enhancing the efficiency of corpus analysis through visualization and quantitative metrics, it provides researchers with an intuitive and powerful solution for content analysis, significantly advancing research in this field.

Considering these reasons, it is evident that Leximancer is a competent semantic network analysis tool, and its features are well-suited for the thematic intertextual analysis required by this study. Hence, Leximancer was chosen as the research tool for this study.

Through this study's analysis, Leximancer identified a total of 48 concept words. The frequency table of concept words from the analysis was exported, and by organizing the frequencies, a list of concept words related to the brand of private hospitals was compiled, as shown in Table 2.1.

Table 2.1 High-frequency concept words related to private hospital brands identified by Leximancer

No.	concepts	Count	Relevance	No.	concepts	Count	Relevance

1	brand	243	100%	25	dimensions	24	10%
2	study	100	41%	26	scale	23	9%
3	hospitals	86	35%	27	analysis	23	9%
4	using	68	28%	28	awareness	22	9%
5	services	63	26%	29	performance	22	9%
6	marketing	60	25%	30	image	21	9%
7	healthcare	47	19%	31	social	20	8%
8	patients	41	17%	32	literature	20	8%
9	health	38	16%	33	strategies	20	8%
10	quality	37	15%	34	significant	20	8%
11	effect	37	15%	35	findings	20	8%
12	research	37	15%	36	media	19	8%
13	value	37	15%	37	including	19	8%
14	medical	36	15%	38	product	19	8%
15	results	32	13%	39	structural	18	7%
16	customer	32	13%	40	care	18	7%
17	management	31	13%	41	present	17	7%
18	model	30	12%	42	based	16	7%
19	relationship	29	12%	43	role	15	6%
20	factors	28	12%	44	information	11	5%
21	loyalty	27	11%	45	advertising	11	5%
22	data	26	11%	46	implications	10	4%
23	important	26	11%	47	qualitative	9	4%
24	tourism	24	10%	48	respondents	8	3%

Table 2.1 presents the frequency (Count) and relevance (Relevance) of high-frequency concept words associated with private hospital branding. Among these, the term "brand" ranks first with a frequency of 243 occurrences and a relevance of 100%, highlighting that branding serves as the core theme in studies related to private hospitals. Following closely are terms such as "study" (100 occurrences, 41%), "hospitals" (86 occurrences, 35%), and "using" (68 occurrences, 28%), indicating that the research is structured around the framework of private hospitals, emphasizing the integration of methodologies and hospital practices.

The high-frequency concept words also reveal critical dimensions related to private hospital branding and healthcare service quality. Words such as "services" (63 occurrences, 26%), "healthcare" (47 occurrences, 19%), "quality" (37 occurrences, 15%), and "patients" (41 occurrences, 17%) underscore the close interconnection between branding, service quality, patient experience, and the overall standard of healthcare provision.

Notably, components of brand equity are also reflected in the concept words, including "value" (37 occurrences, 15%), "loyalty" (27 occurrences, 11%), "image" (21 occurrences, 9%), and "awareness" (22 occurrences, 9%). This indicates that brand equity plays a vital role in the operation and competitiveness of private hospitals and is closely linked to service quality and patient experience.

Furthermore, terms such as "marketing" (60 occurrences, 25%) and "management" (31 occurrences, 13%) emphasize the importance of marketing strategies and management practices in brand development. Additional words like "relationship" (29 occurrences, 12%)

and "factors" (28 occurrences, 12%) suggest that studies on private hospital branding explore multidimensional influencing factors.

The data also highlight terms such as "media" (19 occurrences, 8%), "advertising" (11 occurrences, 5%), and "social" (20 occurrences, 8%), which, despite lower frequencies, reflect the reliance of private hospitals on media and societal recognition for brand communication. Finally, research-related keywords such as "data" (26 occurrences, 11%), "model" (30 occurrences, 12%), "analysis" (23 occurrences, 9%), and "findings" (20 occurrences, 8%) illustrate that the studies are systematic and supported by theoretical frameworks.

In summary, the analysis of high-frequency concept words in Table 2.1 provides a clear framework for understanding the relationship between private hospital branding, service quality, and patient involvement. This insight reinforces the strategic importance of branding within the operational and competitive landscape of private hospitals.

2.1.1 Medical service quality

(1) Concept of medical service quality

Medical service quality refers to the overall quality and level of medical services provided by healthcare institutions or professionals to patients. It encompasses various aspects of medical services, including but not limited to the level of medical technology, the condition of medical facilities and equipment, the professionalism and service attitude of medical staff, and the hygiene and safety of the medical environment. The concept of medical service quality is comprehensive, covering not only the level of medical technology but also the entire process of medical service. This includes the patient's consultation experience, satisfaction with medical staff, and the timeliness and effectiveness of medical services. The quality of medical services directly affects patients' health and quality of life and is also related to the reputation and competitiveness of healthcare institutions (Gudimenko & Kondrashova, 2017).

Healthcare service quality has long been a critical topic in the field of healthcare research. Its focus extends beyond the technical aspects of medical services to encompass the entire service process and the overall customer satisfaction. In recent years, as competition within the healthcare market has intensified and customer demands have diversified, the importance of studying healthcare service quality has become increasingly prominent (Ali et al., 2017). Scholars have explored the definition and evaluation of service quality from various perspectives, offering numerous theories and insights. These studies have not only enriched the understanding of healthcare service quality but also provided theoretical foundations for

its improvement. Crosby (1979) introduced a seminal perspective, defining service quality as the comparison between customer expectations and perceptions. He argued that the core of service quality lies in the gap between what customers expect and what they actually experience. When the actual experience meets or exceeds customer expectations, service quality is perceived positively. This perspective holds particular relevance in healthcare, where patients often approach medical services with high expectations, and the performance of healthcare providers directly influences their evaluations of service quality. Drawing on Crosby's theory, many studies have identified reducing the gap between expectations and perceptions as a key strategy for enhancing service quality. Oliver (1981) further developed this concept by emphasizing the importance of sustained evaluations of service quality. He highlighted that service quality is not solely based on a single interaction but rather on the customer's holistic assessment of the entire service process over time. In the context of healthcare, patient satisfaction depends not only on the immediate experience of a medical visit but also on the overall treatment process, follow-up care, and patient-provider interactions. Oliver's research underscores the longitudinal nature of healthcare service quality, providing healthcare organizations with a comprehensive approach to service improvement. Gronroos (1990) contributed to the discourse by highlighting the subjectivity of service quality, asserting that customers' perceptions of service are inherently subjective. He noted that different customers may evaluate the same service differently, a phenomenon particularly evident in healthcare. Patients' backgrounds, cultures, individual needs, and expectations all influence their perceptions of healthcare service quality. For instance, some patients may prioritize a physician's technical expertise, while others might value communication skills and empathetic interactions more highly. This diversity in patient expectations necessitates a more personalized and nuanced approach to improving healthcare service quality. Kotler (2003) and Qing (2003) emphasized the relativity of service quality, suggesting that its evaluation is contingent on customers' expectations and subjective judgments. They argued that when service performance meets or exceeds customer expectations, the perceived service quality is higher. In healthcare, patients' expectations can be shaped by various factors, such as a hospital's reputation, a physician's credentials, and the patient's own medical condition. This perspective highlights the need for healthcare providers to thoroughly understand patients' expectations and strive to meet or even surpass them in order to enhance service quality (Nguyen et al., 2021).

This study adopts the perspective proposed by the U.S. Office of Technology Assessment (OTA) in 1988, which defines healthcare service quality as the degree to which, under

existing conditions, medical knowledge and technology are applied to increase desired patient outcomes and reduce undesired outcomes. This definition offers a pragmatic framework for assessing healthcare service quality and underscores the balance between medical expertise and patient-centered outcomes.

(2) From the perspective of service quality components, researchers have conducted detailed analyses and proposed several representative theoretical frameworks. Rosander (1980) posited that service quality encompasses multiple elements, addressing various aspects such as responsiveness, professional expertise, and service attitude. For healthcare institutions, these elements collectively shape patients' overall perception of service quality (Wang & Zhang, 2023). For instance, the responsiveness of emergency departments, the diagnostic proficiency of physicians, and the caring attitude of nurses significantly influence patients' comprehensive evaluation of a hospital's service quality. Gronroos (1984) categorized service quality into two dimensions: functional quality and technical quality. Functional quality pertains to the manner in which services are delivered, including the attitudes of healthcare personnel, communication styles, and service processes. Technical quality, on the other hand, refers to the core content of the service, such as the level of medical expertise and diagnostic accuracy. This dual-dimensional framework is particularly applicable to healthcare services, as patients seek both advanced medical technologies to address their health issues and a compassionate and respectful service experience. Gronroos's theory highlights the need for healthcare institutions to balance advancements in technical capabilities with the optimization of service delivery experiences. Lehtinen (1983, 1991) further refined service quality into three dimensions: interaction quality, physical quality, and overall quality. Interaction quality emphasizes the process of interaction between customers and service providers; physical quality involves the service environment and facilities; and overall quality represents an integrated assessment of the service's overall performance. This theoretical framework offers healthcare institutions a multidimensional pathway for improving service quality. For example, hospitals can enhance service quality by improving the physical environment, enhancing the communication skills of healthcare professionals, and optimizing service processes (Kalaja, 2023).

These theoretical frameworks provide a comprehensive understanding of the components of service quality, particularly in the context of healthcare. By addressing both technical and functional aspects, and considering interactional and environmental dimensions, healthcare institutions can achieve a more holistic improvement in service quality, ultimately meeting patient expectations and enhancing overall satisfaction (Bezerra de Oliveira et al., 2024).

(3) The practical significance of research on healthcare service quality

Healthcare service quality is not only a crucial indicator of a medical institution's competitiveness but also a key determinant of patient satisfaction and loyalty (Mahmud et al., 2021). With the increasing diversification and personalization of patient service demands, a single-dimensional approach to service improvement can no longer meet patients' expectations (Berger et al., 2020). The multidimensional nature of service quality requires healthcare institutions to enhance service levels comprehensively by addressing functional, technical, and environmental aspects. Moreover, service quality is closely tied to the brand development of healthcare institutions. High-quality healthcare services contribute significantly to building patient trust and recognition, thereby strengthening the hospital's brand competitiveness. For instance, improvements in technical quality help establish the institution's professional image, while optimizing functional quality fosters emotional resonance with patients (Inaray, 2024). This dual effect not only enhances patient satisfaction but also cultivates greater patient loyalty. Agarwal and Singh (2016) developed a scale to measure the quality of pathology laboratory services. The research context is the increasing attention of Indians to health, the rise of medical tourism, and the prevalence of medical insurance, leading to increased demand for better diagnostic facilities. Through an exploratory study conducted in laboratories in Jaipur on 80 patients, the results revealed three dimensions of service quality: responsiveness, tangibility, and reliability, composed of 13 items. This study is significant as it provides a reliable and effective assessment tool for pathology laboratory service quality. Altaf et al. (2018) aimed to explore the impact of emergency medical service quality on the brand equity of cardiology institutes, using the industry-specific 5Qs medical service quality model. Through a survey of 393 patients across 12 cardiology institutes and data analysis using the Partial Least Squares Structural Equation Model (PLS-SEM), the study showed a weak relationship between medical service quality and hospital brand loyalty but a strong association with brand image and brand awareness. Additionally, brand image and brand loyalty were strongly linked to overall hospital brand equity, while the relationship between brand awareness and hospital brand equity was not significant. This was the first use of the 5Qs model to assess the quality of emergency medical care and its impact on the brand equity of private cardiology hospitals. Ketprapakorn and Kantabutra (2019) researched within a Thai social healthcare enterprise and developed a sustainable social enterprise model, testing the relationship between sustainable practices and sustainable performance outcomes. They found that leadership, stakeholder concern, resilience development, and shared practices are four predictors of enterprise sustainability,

which have direct or indirect positive impacts on brand equity, socio-economic performance, and environmental performance. The study also proposed a coherence theory based on the sufficiency economy philosophy, providing guidance for future research directions and management practices. Huang and Lai (2021) explored how hospital brand can be built through internal brand management practices and analyzed the formation mechanism of Employee Brand Equity (EBE) from employees' perspectives. Through the analysis of 453 questionnaires, the study showed that internal brand management effectively builds EBE, which in turn positively impacts employees' organizational citizenship behaviors and work performance. The results confirm the application effectiveness of EBE in the healthcare service environment, especially in influencing employee behaviors related to public engagement and organizational levels.

This study uses the perspective introduced by the United States Office of Technology Assessment in 1988, stating that medical service quality refers to the degree to which medical knowledge and technology are used under existing conditions to increase desired outcomes and reduce undesired outcomes for patients.

(4) The measurement of healthcare service quality

The measurement of healthcare service quality is critical for the development of the healthcare industry and the enhancement of patient experiences. Drawing upon the classic SERVQUAL model (Pekkaya et al., 2019) and its related studies, healthcare service quality can be comprehensively evaluated across five core dimensions: tangibles, reliability, responsiveness, assurance, and empathy.

Tangibles refer to the physical manifestations of healthcare facilities, equipment, and the environment. This includes the modernization of infrastructure, the sophistication of medical equipment, the cleanliness of facilities, and the overall comfort of the environment. A high-quality tangible environment not only enhances patients' sensory experiences but also strengthens their trust in healthcare institutions (Chen et al., 2024).

Reliability pertains to the consistency and stability of healthcare services, assessing whether medical institutions can fulfill their promises and provide consistently high-standard care. Examples of reliability include the accuracy of diagnoses, the effectiveness of treatments, and the timely resolution of patient issues. This dimension reflects the institution's ability to consistently deliver on its commitments to patients (Fatima et al., 2019).

Responsiveness evaluates the speed and proactivity with which healthcare institutions address patient needs. This includes not only the prompt responses of doctors and nurses to patient inquiries and requests but also the institution's ability to act swiftly in emergency

situations. High responsiveness indicates the institution's attentiveness to patient concerns and its commitment to patient care.

Assurance is a critical dimension that measures the professional competence of healthcare providers and the level of trust patients place in the institution. This includes the knowledge, technical skills, and attitudes of medical staff, as well as their ability to provide reliable medical advice and support. Assurance reflects the confidence patients have in the healthcare institution's expertise and professionalism (Ozretić Došen et al., 2020).

Empathy emphasizes the healthcare team's attention to the individualized needs of patients, highlighting their focus on patient experiences. This includes the ability of medical staff to consider issues from the patient's perspective, provide emotional support, and cater to personalized requirements. Empathy underscores the institution's efforts to foster meaningful and compassionate interactions with patients (Kazi et al., 2024).

By assessing these five dimensions collectively, healthcare institutions can gain a comprehensive understanding of their strengths and areas for improvement in service quality. Such evaluations not only help in identifying precise directions for optimization, improving service processes, and enhancing patient satisfaction but also bolster the institution's competitiveness within the industry (Ng & Luk, 2019). Ultimately, these efforts contribute to elevating the overall quality of the healthcare sector.
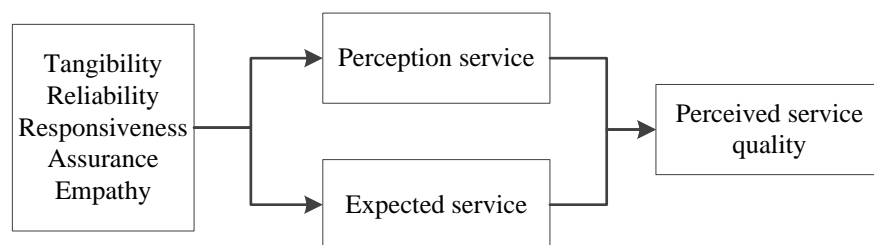
Figure 2.3 SERVQUAL model

Source: adapted from (Fatima et al., 2019)

2.1.2 Brand

2.1.2.1 The concept of brand

A brand is an important and widely discussed concept in the business world, representing not only the name or symbol of a product or service but also a cognitive and image-based presence established in the minds of consumers (Melewar et al., 2020). A brand is more than just a symbol or a logo; it encompasses the collective cognition, perception, and emotions of consumers towards a product or service. Brands hold significant importance in the business world, playing a crucial role in a company's competitiveness and market position. Scholars

have conducted in-depth research and discussions on branding from various perspectives, leading to multiple concepts and theories about brands. Kotler (2012) emphasizes the brand as a noun that differentiates products or services and positively impacts a company's competitiveness. Kotler believes that brands not only help companies stand out in the market but also enhance their competitive advantages and attract more consumers. Lan (2014) defines a brand as an intangible asset that is gradually built in consumer cognition. Lan highlights the importance of brand cognition and the cognitive process in the branding effort. Consumer cognition and experience directly influence the formation and development of a brand. Wang (2015) further emphasizes the establishment of a brand in consumers' minds, closely related to their experiences and cognition. A successful brand needs not only to be well-known in the market but also to resonate with consumers' experiences and perceptions, thus establishing trust and loyalty towards the brand.

In the field of brand theory, Keller (1993) provides a systematic framework for understanding the core sources of brand equity and its mechanisms. This model identifies brand awareness and brand image as its two central dimensions, emphasizing that brand equity is derived from consumers' subjective perceptions. These perceptions—encompassing cognitive, emotional, and behavioral responses to the brand—collectively determine the value of brand equity. Keller posits that brand awareness determines whether consumers can recognize and recall a brand. High brand awareness ensures that a brand is more likely to be included in consumers' consideration sets, becoming a priority in their decision-making process. Specifically, brand awareness comprises two forms: brand recall and brand recognition. Brand recall refers to a consumer's ability to actively retrieve a brand from memory when prompted by a product or service category, while brand recognition denotes the ability to associate a brand's logo or name with its corresponding product or service upon exposure. Aaker (1991) further underscores the critical role of brand awareness in brand equity, highlighting that it is not only a fundamental component of brand equity but also significantly influences a brand's growth potential and market competitiveness. High-awareness brands tend to attract greater consumer attention and occupy a more advantageous position in the market. For instance, well-known brands leverage advertising, word-of-mouth, and social influence to establish a solid cognitive foundation among consumers, making them the preferred choice during purchase decisions. Moreover, brand awareness enhances consumer trust and reduces perceived risks associated with trying new products. In addition, brand awareness plays a pivotal role in supporting brand extension strategies. When launching new products or entering new markets, highly recognizable brands

can capitalize on existing awareness to reduce marketing costs and accelerate market penetration (Ahmed, 2022).

The second core dimension of the CBBE model is brand image, which reflects consumers' subjective perceptions of a brand, encompassing associations, emotions, and evaluations. Keller argues that building brand image relies on the quality, quantity, and uniqueness of brand associations. These associations may originate from intrinsic brand attributes (e.g., product features, quality) or external factors (e.g., advertising, cultural influences) (Keller, 1993). A positive brand image enhances consumer preference and loyalty. The establishment of a strong brand image is crucial for enhancing a brand's competitiveness. Research suggests that consumers are more likely to choose brands that resonate with their values or fulfill their emotional needs. For example, Apple Inc. has cultivated an "innovative, premium, and stylish" brand image through cutting-edge technology and minimalist design, attracting a global base of loyal users. This distinctive brand image not only elevates consumers' perceived value but also enables the brand to stand out in a highly competitive market (Chou et al., 2019). Furthermore, brand image directly influences consumer purchasing behavior. A company with a favorable brand image is more likely to build consumer trust and loyalty, forming a strong brand equity foundation. Aaker (1991) asserts that brand image affects brand equity by influencing consumers' perceived value, emotional attachment, and purchase intentions. These factors contribute to the accumulation of brand equity and the consolidation of the brand's market position (Zia et al., 2021).

Consumers' cognition and image of a brand directly affect their buying behavior and brand loyalty. Kotler and Keller (2006) further note that in branding strategy, Brand Awareness and brand image are crucial. By establishing a positive brand image and enhancing Brand Awareness, companies can stand out in a competitive market, attract more consumers, increase market share, and improve profitability.

First, the concept of brand image.

Brand Image refers to consumers' perceptions, cognitions, and evaluations of a brand, representing the unique image and impression of the brand in the minds of consumers. Closely related to brand recognition, Brand Image stems from the brand recognition created earlier and represents how the brand manifests in consumers' minds. This image is built through the company's brand identity strategies and market (Iglesias et al., 2019) .

In the contemporary business environment, the development and maintenance of brand image and its impact on corporate performance is an area of ongoing exploration. This is particularly critical in the healthcare industry where strategic brand management is crucial for

small to medium-sized enterprises (SMEs) as it directly impacts their survival and growth in a competitive market. Baharun et al. (2019) aimed to explore the brand dimensions of SMEs in the Malaysian market and how these dimensions affect business performance. By integrating qualitative and quantitative methods, the study gathered data from 67 participants, including owners, health professionals, and customers at a healthcare center, finding that effective brand positioning is crucial to enhancing healthcare performance. This research provides new insights into the influence of brand marketing knowledge and dimensions for healthcare SMEs. Al-Hasan (2024) investigated how hospitals' marketing activities on social media platforms like Instagram affect their brand equity and ultimately their financial performance. Analyzing data from a random sample of 728 residents in Kuwait, along with online/offline survey data and hospital financial data using structural equation modeling, the study discovered that posts based on educational content, patient stories, and recent news significantly enhance brand awareness, perceived brand quality, brand associations, and brand loyalty, thereby strengthening perceived brand equity. Moreover, brand equity was shown to positively and significantly impact the hospital's financial performance, underscoring the importance of creating engaging, educational, and personalized content. Kim et al. (2011) discussed how marketing strategies could be applied to recruitment marketing in the hospital industry, aiming to use marketing to help hospitals create a positive corporate image to attract superior doctors. The study demonstrated that a hospital's sustained competitive advantage, marketing strategies, and employment brand equity can influence doctors' job intentions. Yu et al. (2021) examined the role of the WeChat public platform in health communication practices at Municipal Hospital A and its impact on the hospital's brand. Conducting an online survey from October to November 2019, using a Likert five-point scale to assess hospital brand equity, a Hotelling t2 test was utilized to compare differences in brand equity between users who followed and those who did not follow WeChat health communications. Results showed that followers scored higher on all brand equity dimensions, indicating that WeChat health communications could significantly enhance all aspects of the hospital's brand. The study suggests that WeChat's health communications offer a new pathway for building brand equity in municipal hospitals. Joachimsthaler and Aaker (1997) discussed how market fragmentation, the rise of new media channels, and customers bypassing advertisements affect traditional marketing. The study analyzed how several European companies adopted alternative brand-building methods in the post-mass media era. For instance, Nestlé promoted the Buitoni brand by teaching British people to cook Italian food, The Body Shop gained loyalty by supporting environmental and social causes, and Häagen-Dazs enhanced its brand

image by opening high-end ice cream parlors and featuring its brand on the menus of select restaurants. The research provides guidelines for successful brand building and highlights the importance of core brand identity. Kim et al. (2012) explored the shortcomings of traditional human resources management in adopting marketing methods to create a positive corporate image and attract superior employees. The study found that marketing can help hospitals create an effective image and position themselves as excellent workplaces. By analyzing recruitment marketing in the hospital industry, it was discovered that the hospital's sustainable competitive advantage, marketing strategies, and employment brand equity could influence doctors' career intentions. This research offers strategic suggestions for hospitals on how to attract and retain talented doctors through marketing strategies. Medina et al. (2016) analyzed the strategic impact of social media networks on disseminating hospital brand architecture. The study examined Facebook profiles of 400 hospitals in the United States to check if they used ten recommended brand architecture indicators. The results showed that 94% of leading hospitals had active profiles on Facebook, but only three to five of the recommended indicators were used. This suggests that while most hospitals utilize social media, there is still a need to deepen professional management and strategic positioning, especially in using corporate videos and results-oriented strategies. Oh et al. (2016) based on the Efficient Market hypothesis, posited that stock prices should reflect the full value of corporate advertising. However, research from 1995 to 2015 found that advertising expenditures often led to abnormal stock returns the following year, particularly in the consumer goods and services industries, where brand equity building can carry over from one year to the next. For advertising in healthcare, industrial goods, or retail, no significant differences were found. These results may assist marketing managers in justifying advertising budgets that benefit future periods but may compromise current profits.

There is a close relationship between brand image and brand identity. Brand identity represents the desired state of the brand as communicated by the company; it is the degree to which the brand is recognized and identified in the market. Brand image, on the other hand, is the perception and evaluation of brand identity by customers, constituting the specific impressions and images that consumers hold about the brand. The establishment and shaping of brand image are based on brand identity and are influenced by various market activities, product quality, service experiences, and other factors, which collectively form the overall impression of the brand in the minds of consumers.

The impact of brand image is significant, as it directly influences consumers' trust in the brand, their loyalty, purchasing behavior, and the company's performance. Consumers'

perceptions and evaluations of brand image directly affect their purchasing decisions and behaviors, subsequently impacting the brand's market position and competitive advantage. Therefore, companies should prioritize the shaping and management of brand image to enhance consumers' trust and loyalty, thereby improving the company's market performance and competitiveness. A well-established brand image can provide the company with broader market opportunities and growth potential.

Second, the concept of brand awareness.

Brand Awareness refers to the degree to which consumers recognize and recall a particular brand. According to Rossiter and Percy (1987) and Yoo and Donthu (2000), Brand Awareness can be divided into two dimensions: brand recognition and brand recall. Brand recognition refers to consumers' ability to recognize a brand's logo and recall its name and related information after prolonged exposure to the brand. Brand recall, on the other hand, refers to consumers' ability to remember a brand, including its name, product features, and other related details, when a need arises.

Brand awareness is a critical metric for assessing consumers' recognition and recall of a brand, reflecting its position in the market and the degree to which consumers are familiar with it. As a core component of brand equity, brand awareness plays a pivotal role in influencing consumer purchasing decisions. By establishing and maintaining high levels of brand awareness, companies can enhance their market competitiveness and attract a larger base of potential customers. Rossiter and Percy (1987) define brand awareness as the ability of consumers to identify and remember a brand. They further categorize it into two key dimensions: brand recognition and brand recall. Brand recognition refers to a consumer's ability to recognize a brand when exposed to its logo, name, or tagline. This dimension primarily reflects a consumer's visual or auditory reaction to brand symbols and is a crucial goal during the early stages of brand building. In contrast, brand recall refers to a consumer's ability to actively retrieve a brand from memory in a specific consumption context. For instance, when a consumer intends to purchase a smartphone, the ability to first think of Apple or Samsung illustrates the concept of brand recall. Percy and Rossiter (1992) further highlight that brand awareness can be measured through the degree of consumer familiarity with a brand. Higher familiarity corresponds to stronger brand awareness. Familiarity depends not only on the frequency of brand exposure but also on the clarity, memorability, and distinctiveness of the brand's messaging. Building brand awareness requires companies to adopt effective strategies in market promotion, ensuring that the brand resonates with its target audience. Zhuang (2007) emphasizes the significance of brand awareness from a

market impact perspective, stating that it directly reflects a brand's influence and popularity in the market. High-awareness brands can achieve broader market coverage and capture greater consumer attention, providing a substantial competitive advantage. During brand promotion efforts, well-known brands are often more likely to gain consumer trust and preference compared to emerging brands.

In summary, brand awareness serves as the foundation for building brand equity and establishing a competitive edge in the marketplace. By strengthening consumer recognition and recall, companies can enhance their market influence, attract a broader consumer base, and stand out in an increasingly competitive environment. High-awareness brands not only increase market share but also foster strong brand associations in consumers' minds, ultimately cultivating long-term brand loyalty (Bernarto et al., 2020).

Additionally, the psychological activities related to Brand Awareness are critical in forming consumers' brand impressions. According to Han et al. (2014), consumers engage in psychological activities when exposed to brand information, including brand recognition and brand recall processes, which shape their impressions and attitudes towards the brand. These psychological activities directly influence consumers' level of brand recognition and recall, ultimately affecting their brand preference and purchasing behavior.

Jain and Singh (2019) conducted a study evaluating the marketing effectiveness of 12 hospitals over a two-year period. These hospitals each had at least 100 beds and 5 intensive care units and had been in operation for at least five years. The study revealed that some hospitals engaged in marketing at the local and state levels, while others expanded their efforts to national and even global scales. The research emphasized that healthcare facilities should not be advertised like other commodities, as they involve matters of life and patient trust. Sudirman et al. (2020) aimed to investigate the impact of public hospital brand equity on customer lifetime value and further explored the key indicators constituting the measurement variables of public hospital brand equity. The study focused on residents of Makassar, South Sulawesi Province, Indonesia, using cluster random sampling. The validity and reliability of the brand equity measurement variables were tested through confirmatory factor analysis, and in-depth interviews were conducted to deepen the understanding of the results. The findings indicated that all indicators were valid and reliable in measuring brand equity. Kauer and Berkowitz (1997) analyzed why strategic positioning is critical for healthcare organizations struggling in a managed care environment and what the sources of value are. In the first part, the authors discussed four sources of value—assets, price/performance, distribution, and ultimate capabilities and brand equity—during the market

evolution from fee-for-service to managed care. In this study, the authors further explored how marketing and financial challenges in a managed care market scenario influence organizational positioning and performance.

2.1.2.2 Measurement of brand

(1) The dimensions of brand image

The dimensions of brand image indicators in both Chinese and foreign literature suggest that brand image is composed of multiple dimensions.

First, Kapferer's six-brand prism model.

Research on brand image indicates that it is a multidimensional construct. Kapferer's Six-Brand Prism Model (Spiga & Cardebat, 2024) dividesbrand identity into six facets: physique, personality, culture, relationship, responsiveness, and self-image, emphasizing the multifaceted structure of brand image. This model posits that brand image encompasses not only physical characteristics but also includes aspects such as brand personality, cultural connotations, and interpersonal relationships, forming an organic whole. From this perspective, consumers' perception of a brand extends beyond its external features to include their perceptions of the brand's culture and relationships. Therefore, companies need to shape and manage their brands from multiple angles, not only focusing on the product's appearance but also on brand personality and cultural content. Kapferer's Six-Brand Prism Model provides a systematic framework for analyzing brand image, helping companies to gain a deeper understanding of the components and influencing factors of their brand image, thereby guiding brand management practices. This theory offers significant theoretical support for brand image research, enriching the understanding of brand perception and providing a comprehensive and in-depth perspective on brand management for companies (Zheng, 2008).

Second, Keller's brand image model.

Keller proposed a brand image model by analyzing brand associations and their components, providing crucial guidance for brand management. He categorizes brand associations into three elements: attributes, benefits, and attitudes, and asserts that benefits and attitudes are the key components of brand image. Benefits include functional, experiential, and symbolic aspects, reflecting consumers' expectations and perceptions of the brand. Functional benefits cover the practicality and functional features of the product, experiential benefits emphasize the pleasure and enjoyment consumers derive from using the product or service, while symbolic benefits relate to the personal or social values represented by the product or service. Attitudes express consumers' emotional attitudes toward the brand,

including their level of liking, trust, and loyalty. Additionally, Keller emphasizes the indirect impact of non-product-related attributes on consumer purchasing behavior, including attributes such as price, packaging, and user imagery. This view is supported by Jiang and Cao, whose research underscores the importance of non-product-related attributes in shaping brand image and influencing consumer purchasing behavior. Therefore, in addition to attributes, benefits, and attitudes, companies should also pay attention to pricing strategies, product packaging, and the communication and marketing of brand image, as these factors significantly impact brand image and consumer behavior (Jiang & Cao, 2003).

Third, Bell's three-dimensional model.

Bell's three-dimensional (Kent, 2003) brand image model is based on consumer associations, summarizing the main sources of brand image and breaking them down into three dimensions: corporate image, user image, and product image. This model provides a systematic framework for understanding brand management. Corporate image is one of the crucial components of brand image, including elements such as innovation and historical continuity (Balmer & Podnar, 2021). The establishment of corporate image is not only based on the company's products and services but is also closely related to its culture, values, and social responsibility. Second, user image encompasses the demographic characteristics of brand users as well as soft characteristics like personality and values. Consumers' perceptions and attitudes toward the brand are often influenced by other users, making the shaping and management of user image critical. Product image corresponds to the functional and beneficial aspects of the product, including origin, packaging, and product performance. Consumers' perceptions and expectations of the product directly influence the formation and maintenance of brand image. Bell's research highlights the importance of the three dimensions—corporate, user, and product image—in brand image, providing a multidimensional understanding framework. This model helps companies better understand and manage the sources of brand image, thereby formulating more effective brand management strategies (Fan & Chen, 2022).

Fourth, a. Belen model.

The Belen model (Hossain et al., 2020) is an empirical study developed specifically for brand image, aiming to quantify its different dimensions. This model includes four key constructs: product quality, personality, social identity, and social status. These four constructs reveal the main dimensions of brand image, providing a comprehensive framework for evaluating brand image. The product quality dimension focuses on the quality level and performance of the products offered by the brand, emphasizing the direct relationship between

brand image and product quality. The personality dimension involves the brand's personality traits and uniqueness, highlighting the importance of a distinctive and personalized brand image in the market. The social identity dimension considers the emotional connection and social identity between the brand and consumers, including the degree of consumer identification with the brand and the emotional bond between the brand and consumers. The social status dimension emphasizes the brand's position and influence at the societal level, including the brand's recognition, reputation, and status in society.

Fifth, Chinese research on brand image dimensions.

In recent years, Chinese research on brand image dimensions has gradually gained attention, showing a trend toward diversification and systematization, inspired by relevant foreign theories. Luo (2001) provided a detailed definition of brand elements from the perspective of brand identity, dividing brand image into aspects such as brand essence, extended identity, and brand attributes. Luo Ziming categorized the dimensions of brand image into four areas: brand cognition, product attributes, brand associations, and brand value, providing a significant theoretical foundation for Chinese brand image research.

Professor Fan (2022) built upon Luo's work and proposed a more comprehensive brand image evaluation model, which includes product, corporate, humanized, and symbolic dimensions. Fan Xiucheng's research drew upon relevant international studies, aiming to construct a more complete and multidimensional brand image evaluation system, emphasizing the diversity and complexity of brand image. Chinese research on brand image is gradually evolving from single theoretical explorations to multidimensional and systematic approaches. Although it started relatively late, Chinese scholars have actively drawn from international research and continuously explored both theory and practice, injecting new vitality and momentum into the development of Chinese brand image research. As research deepens and accumulates, Chinese studies on brand image dimensions will become more enriched and mature, providing more effective brand management strategies and practical guidance for companies.

(2) Dimensions of brand awareness

The dimensions of brand awareness are a crucial component of brand equity research, shedding light on the different levels of consumer recognition and providing a theoretical foundation for brand management and marketing strategies. Building on the work of Yoo and Donthu (2001), Sun (2018) further explored and quantified brand awareness. He simplified the MBE (Meaning, Brand, Equity) model and developed a single-dimensional scale comprising four core items. This streamlined and efficient measurement approach is

particularly suitable for studying brand recognition in diverse scenarios.

Sun's research is notable for its innovation, as he extended the practical application of the MBE model by incorporating insights from marathon contexts. Beyond examining brand awareness itself, his study analyzed its interaction with online reviews, offering a distinctive perspective within the field of brand research. This is especially relevant in today's digital consumer environment, where online reviews have become a critical factor influencing brand awareness. For instance, positive reviews can significantly enhance brand recall and recognition, while negative reviews may erode a brand's market image (Kucuk, 2008). By introducing this dimension, Sun provided a novel angle for understanding the measurement and application of brand awareness.

In addition, the China Statistical Information Service Center conducted an in-depth investigation into the relationship between brand awareness and online reviews (Yang et al., 2022). Taking a broader statistical perspective, their study examined the interaction between brand awareness and related variables, employing subgroup analysis to uncover the mechanisms through which online reviews impact brands with varying levels of awareness. The subgroup analysis revealed significant differences in the effects of online reviews on high-awareness and low-awareness brands. For high-awareness brands, positive reviews further reinforce consumer recognition of the brand, while for low-awareness brands, online reviews play a pivotal role in spreading brand information and shaping consumer perceptions (Chakraborty, 2019).

Collectively, these studies enrich the theoretical dimensions of brand awareness. They not only simplify and enhance the practical application of measurement methods but also reveal new directions in the study of the interplay between brand awareness and digital interactions. These findings offer valuable insights for corporate brand management and the development of digital marketing strategies, emphasizing the critical role of online engagement in shaping consumer brand perceptions (Ansari, 2019).

2.1.3 Patient involvement

(1) Concept of patient involvement

Patient involvement refers to the degree of an individual's engagement and participation in health-related matters, encompassing their cognitive, emotional, and behavioral responses to healthcare services and health management (Graffigna et al, 2015). As a critical concept in the healthcare field, patient involvement reflects not only an individual's attention to health issues but also their active participation in medical decision-making, health behaviors, and

information processing. With the ongoing shift in healthcare models toward patient-centered care, the study of patient involvement has garnered increasing attention (Timmermans, 2020).

First, definition and theoretical foundations.

The concept of patient involvement originates from the broader theory of involvement in psychology. According to Krugman (1965), involvement arises from an individual's perceived relevance of an issue to their personal life. Health-related matters, which directly affect patients' daily lives and quality of life, are deeply intertwined with their personal circumstances. Krugman posited that the closer the connection between health issues and an individual's life, the higher their level of attention and participation. For example, individuals with chronic illnesses often exhibit greater attention to the details of health management during prolonged treatment, as these activities directly influence their well-being and health outcomes. This perspective underscores the critical role of practical life needs in driving patient involvement.

Rothschild (1984) expanded the concept of involvement by emphasizing that it encompasses not only the effort and attention an individual invests in health-related matters but also the psychological arousal triggered by motivation and interest. This suggests that patient involvement is not solely manifested in observable behaviors but also involves intrinsic psychological processes. In a medical context, this psychological arousal is evident in patients actively seeking health information, carefully evaluating treatment options, and emotionally engaging in medical decision-making. For instance, cancer patients choosing a treatment plan often demonstrate high levels of involvement, as they diligently review relevant materials, communicate extensively with their healthcare providers, and incorporate their personal needs into the development of a tailored treatment strategy.

In the context of patient involvement, Chinese scholars have placed greater emphasis on the role of emotions and interests, arguing that it reflects an individual's emotional connection to health-related matters and their level of interest in those matters. This perspective highlights the importance of patients' psychological needs, suggesting that involvement is driven not only by their cognitive understanding of the significance of health issues but also by their emotional and motivational states (Dijk et al., 2020).

Second, core elements of patient involvement.

Patient involvement is a multidimensional concept that can be analyzed through three key aspects: cognitive, emotional, and behavioral dimensions (Han et al., 2019).

The cognitive dimension of patient involvement refers to the patient's understanding of health-related matters and their ability to process information. Patients with high cognitive

involvement typically exhibit a strong demand for information and a proactive willingness to acquire medical knowledge. These patients actively engage in the healthcare process by thoroughly researching treatment recommendations provided by physicians and asking informed questions tailored to their needs (Muscat et al., 2021). For instance, chronic disease patients, when faced with medication choices, may investigate drug side effects, efficacy, and costs to make the most optimal decisions. This dimension highlights the role of knowledge acquisition and analytical thinking in patient engagement (Szumacher, 2019).

The emotional dimension reflects the attitudes and emotional experiences of patients regarding health-related matters. Patients' emotional connection to their health is often closely linked to the severity of their illness and changes in their quality of life (Marzban et al., 2022). For example, chronic disease patients may experience anxiety about disease management, but as they build trusting relationships with healthcare providers, they are likely to become more positive and engaged in health-related activities. Emotional support from medical professionals, such as empathetic communication and reassurance, plays a crucial role in enhancing this aspect of patient involvement. By addressing the emotional needs of patients, healthcare providers can foster a supportive environment that encourages active participation.

The behavioral dimension of patient involvement encompasses the patient's proactivity and engagement in health-related activities. This includes actions such as adhering to regular health check-ups as recommended by physicians, following prescribed medication regimens, and participating in health education programs. These behaviors indicate the patient's commitment to health management and directly influence treatment outcomes and overall health (Forsythe et al., 2019). Highly involved patients often demonstrate strong self-discipline, actively participate in the diagnostic and treatment processes, and maintain close collaboration with healthcare teams.

Thrid, levels of patient involvement.

The concept of patient involvement has been explored at various levels by different scholars, revealing its multidimensional nature and complex nature. From psychological activities and motivational mechanisms to external behavioral responses, these studies provide valuable insights into the dynamics of patient involvement and its implications in healthcare (Halabi et al., 2019).

Cohen (1983) defined involvement as the level of attention an individual devotes to health-related matters, emphasizing its role as a reflection of internal psychological activity. This view posits that the allocation of attention to health issues is a key indicator of involvement. For example, a patient focusing on the details of a specific health intervention

can have their involvement assessed by measuring the degree of attention given to those details. Cohen's definition highlights the cognitive and information-processing aspects of involvement, laying the groundwork for subsequent research in this area. Rothschild (1984) expanded the concept by proposing that involvement arises from a motivation-driven state of psychological arousal, directly influencing how individuals process health-related information. This arousal reflects the importance an individual places on health matters and is closely tied to the intensity of their motivation. For instance, a highly motivated individual seeking to prevent disease is more likely to proactively acquire health information and actively participate in medical decision-making. Rothschild's perspective underscores motivation as a core driver of involvement, providing critical theoretical support for understanding patient behavior. Andrews et al. (1990) described involvement as an activation state triggered when individuals face health-related matters, emphasizing its dynamic nature. They argued that involvement is not merely a psychological condition but also a response pattern in dealing with health issues. For instance, when patients engage with a new treatment plan, those exhibiting a high activation state may optimize their decision-making process through proactive questioning and discussion. This perspective highlights involvement as an active psychological mechanism that facilitates better healthcare outcomes. Toncar and Munch (2001) focused on the role of task context in determining the level of involvement, defining it as the amount of attention an individual allocates to a specific task. They noted that different health-related tasks and contexts significantly influence patient involvement. For instance, complex treatment decisions may require patients to invest substantial attention and cognitive resources, whereas routine health check-ups may elicit relatively lower levels of involvement. This research provides practical guidance for healthcare providers in designing targeted health interventions, emphasizing the need to tailor engagement strategies based on task complexity and context. More recently, Sakulsaengprapha et al. (2022) expanded the application of patient involvement by analyzing the use of social media by the top 100 highest-revenue hospitals in the United States. Their study explored the relationship between social media activity, patient experience ratings, and hospital reputation. They found significant variation in the use and effectiveness of social media across institutions, with limited correlation between social media metrics and patient experience rankings. These findings suggest that healthcare institutions need to better manage social media strategies to enhance patient involvement and improve patient experiences. For example, through personalized content and interactive engagement, hospitals can encourage patients to actively participate (Newman et al., 2021) in health-related matters, thereby boosting satisfaction and trust in healthcare services.

Despite differences in how various scholars define and interpret involvement, all highlight its strong connection to individuals' internal psychological states and the allocation of attention. This relationship is evident not only in patients' focus on health information but also in their proactivity and depth of participation in health-related decisions. Patients with higher levels of involvement often demonstrate more active health behaviors, such as asking questions, engaging with physicians, and adhering (Palumbo et al., 2021). . In contrast, patients with lower levels of involvement may exhibit passive or indifferent attitudes toward health matters, which can adversely impact health management and clinical outcomes. Understanding the levels of patient involvement provides healthcare providers with actionable insights for enhancing patient engagement. By addressing the cognitive, motivational, and behavioral aspects of involvement, healthcare systems can foster a more participatory approach to care, ultimately improving both patient satisfaction and health outcomes.

The second group of scholars focuses on the relationship between involvement and commodity value. Hsu and Lee (2003) define involvement as the time and effort a consumer invests in the purchasing decision process, including the extent of searching, evaluating, and selecting product information. Furthermore, a consumer's level of involvement with a product or service is influenced by its perceived value. Assis and Vilela (2024) analyzed the impact of social media marketing by doctors and dentists on consumer purchase intentions, particularly through perceived value co-creation, brand equity, and consumer brand engagement. The study used Partial Least Squares Structural Equation Modeling (PLS-SEM) to test hypotheses, showing that social media marketing positively influences perceived value co-creation and enhances purchase intentions through brand equity. This provides new insights into social media marketing strategies in the healthcare industry. Tuan (2014) analyzed 417 questionnaire responses from clinical staff using Structural Equation Modeling to explore how corporate social responsibility (CSR) drives the formation of hospital brand equity through clinical governance effectiveness. The study found that CSR is a strong predictor of clinical governance effectiveness, and effective clinical governance can improve patient care quality and ultimately enhance hospital brand equity. This research provides insights into how CSR can activate clinical governance mechanisms, showing CSR's critical role in improving healthcare quality and hospital brand equity. Generally, high-involvement products have strong self-relevance, social evaluation, and high prices, while low-involvement products do the opposite. This indicates that consumers' level of involvement in the decision-making process is closely related to the perceived value and relevance of the product or service (Hickmann et al., 2022).

The third category of scholars integrates evaluations from the first two categories, proposing a more comprehensive theory of involvement. This line of research not only focuses on the internal psychological activities associated with involvement but also emphasizes its multidimensional nature and the influence of contextual factors. Hu and Zhang (2007) argue that involvement reflects the degree of association between individuals and specific issues, with this association being a manifestation of subjective cognition and emotion while also significantly influenced by external environments and situational factors. For instance, an individual's level of involvement in health matters may vary depending on the severity of the illness, the quality of healthcare services, and the patient's psychological state. Laczniak et al. (1989), from the perspective of advertising, define involvement as a motivational state triggered by specific situations or advertising content. This perspective underscores the role of situational triggers, suggesting that involvement encompasses emotional and cognitive components while also being driven by external stimuli. For example, promotional content about health management in medical advertisements may draw attention to an individual's own health status, prompting active engagement in health-related matters. This theoretical perspective provides a novel explanatory framework for understanding individual decision-making in specific contexts and positions involvement as a dynamic psychological state (Malterud & Elvbakken, 2020).

Taken together, the third category of scholars conceptualizes involvement as a complex, multidimensional construct encompassing emotional, cognitive, and contextual dimensions. This theoretical framework not only offers a more comprehensive perspective for involvement research but also provides practical guidance for its application. In the healthcare industry, patient involvement manifests in their attention to health issues, depth of processing medical information, and level of participation in treatment processes (Rowland et al., 2019). Highly involved patients tend to prioritize the quality of medical services, the professionalism of healthcare teams, and the hospital's brand reputation. They actively gather medical information, engage in in-depth communication with healthcare providers, and participate in treatment decisions. In contrast, low-involvement patients are more influenced by external factors such as cost and location, exhibiting lower willingness to participate and less active decision-making. Patient involvement significantly impacts healthcare-seeking behavior and the choice of medical institutions. On the one hand, highly involved patients often exhibit greater health awareness (Bergerum et al., 2019) and are more likely to choose healthcare providers offering superior service quality and strong brand reputations. On the other hand, low-involvement patients tend to focus on convenience and cost, opting for nearby or

lower-priced healthcare services. Understanding patient involvement characteristics helps healthcare institutions optimize service strategies. For highly involved patients, providers can meet their informational needs and participation expectations by offering detailed medical information, personalized health management plans, and transparent decision-making processes. For low-involvement patients institutions can focus on enhancing service convenience, cost-effectiveness, and simplifying overall processes to increase their willingness to seek care (Greenhalgh et al., 2019). Moreover, research on patient involvement holds significant implications for healthcare branding and service optimization. Highly involved patients often exhibit stronger loyalty, serving not only as stable customers but also as key sources of word-of-mouth promotion. Simultaneously, by increasing the involvement of low-involvement patients, healthcare institutions can expand their service reach and enhance market competitiveness. Developing targeted service strategies based on involvement theory not only improves patient satisfaction but also provides a solid foundation for the long-term development of healthcare institutions. In summary, involvement research offers valuable theoretical insights and practical guidance for the healthcare sector in improving patient experiences, optimizing service processes, and advancing brand development (Holmes et al., 2019).

(2) Measurement of patient involvement

Researchers have developed various scales to measure involvement, aiming to distinguish the different levels of involvement participants have in specific activities or topics. These scales have been widely adopted and are highly regarded in research. The following two scales are among the most frequently used:

First, the vaughn scale:

The Vaughn Scale, developed by Vaughn (1986), is a tool designed to determine the quadrant of a product within the FCB Grid Model. This model categorizes products into four quadrants based on two dimensions: "high-low involvement" and "cognitive-affective." Each quadrant represents a different type of purchasing decision. The Vaughn Scale includes three subscales: involvement, cognition, and affect. The involvement subscale contains three items designed to measure the degree of consumer involvement with the product. The model explains the consumer decision-making process and introduces the concept of "involvement," deepening the understanding of this process. The Vaughn Scale has been widely applied in practice, particularly in considering product attribute characteristics to classify quadrants, helping to understand the features of purchasing behavior, and assessing the impact of factors such as the magnitude of loss and the amount of information on the decision-making process.

Therefore, the Vaughn Model, by enhancing the explanatory power of the decision-making process, provides valuable tools and perspectives for marketing research and practice.

Second, the personal involvement inventory (PII):

Zaichkowsky (1985) developed the Personal Involvement Inventory in the early 1980s, a scale measuring emotional and cognitive involvement, providing a robust tool for understanding individual involvement in the consumption process. Emotional involvement emphasizes an individual's subjective feelings, while cognitive involvement focuses on the level of cognitive processing activation. These two dimensions reflect the psychological state and cognitive process of individuals during consumption activities, which are crucial for deeply understanding consumer behavior and decision-making processes (Ree et al., 2019). Each of the emotional and cognitive involvement subscales contains five items, covering consumers' experiences and perceptions in these areas. For example, items on the emotional involvement scale might include terms such as "interesting" and "pleasant," while items on the cognitive involvement scale might include terms like "attention-grabbing" and "engaging." These items aim to assess the degree of emotional and cognitive engagement during purchasing behavior, thus providing a comprehensive understanding of involvement in specific consumption contexts. The research by McQuarrie and Munson (1987) played a significant role in the development of the Personal Involvement Inventory. Their findings indicated that the scale has high reliability and validity, accurately assessing individual involvement levels in specific situations. Additionally, the study found that an individual's emotional state and level of cognitive processing significantly influence the degree of involvement, further validating the scale's effectiveness and accuracy (McQuarrie & Munson, 1987).The emotional and cognitive involvement items effectively reflect individuals' feelings and cognitive processes during consumption activities, providing researchers with a comprehensive tool to understand individual involvement. This scale has been extensively used not only in academic research but also in marketing practice. By utilizing the Personal Involvement Inventory, marketers can better understand consumers' psychological characteristics and behavioral tendencies, allowing them to develop more targeted marketing strategies and campaigns, thereby enhancing the market competitiveness of products and services.

The above review indicates that while there are multidimensional scales for measuring patient involvement, this study opts for a unidimensional scale based on the following considerations. First, a unidimensional scale ensures reliability and validity while simplifying the measurement process, making it more suitable for large-scale healthcare surveys and

enhancing the feasibility of the study. Second, Zaichkowsky's revised Patient Involvement Inventory (PII) has been widely validated and effectively assesses patients' engagement and attention in medical services; therefore, adopting this scale ensures scientific rigor and applicability. Third, a unidimensional scale reduces respondents' cognitive load and response fatigue, thereby improving the quality of questionnaire responses. This approach is particularly advantageous in healthcare research, where minimizing respondent burden is essential for obtaining accurate data.

2.1.4 Brand equity

(1) Concept of brand equity

Both academics and marketing practitioners have reached a consensus on the importance of brands, recognizing brand equity as a significant asset for companies (Ishaq & Di Maria, 2020). Aaker defines brand equity as a set of assets and liabilities associated with a brand, brand name, and symbol that add to or subtract from the value provided by a product or service to a company or its customers. Similarly, Simon et al. (1993) and Lassar et al. (1995) assert that brand equity encompasses all tangible and intangible elements of a brand that contribute to sustained profit growth. The concept of brand equity has been widely discussed across various fields such as finance, accounting, and marketing, with differing definitions in each field. This study focuses specifically on brand equity within the marketing domain. In the academic field, brand equity has been primarily defined from two perspectives: consumer and corporate.

First, from the consumer perspective:

Brand equity is viewed as the unique impression of the brand in the consumer's mind, emphasizing cognition, emotion, and attitude. The concept of brand equity based on consumer cognition was first proposed by Aaker (2009), who described brand equity as a set of assets and liabilities related to a company's brand, which reflects the value a product or service brings to the company and its customers. Swani and Yoo (2010) explored the interactive effects of price and price discounts, particularly examining how consumer behavioral intentions change when high-price and low-price brands offer discounts. Through a two-factor experimental design, they tested two existing brands and a fictitious brand. The results confirmed that the effect of price discounts varies depending on the brand's price level: for high-price brands, discounts negatively impact behavioral intentions (brand equity, brand loyalty, and purchase intentions), whereas for low-price brands, discounts positively influence these behavioral intention variables. The study suggests that high-price brands should avoid

offering discounts, while low-price brands can benefit from them. Subsequently, Keller (2019) described brand equity as the "added value" given to products in the minds, conversations, and actions of consumers, which companies can leverage in various ways to achieve higher profits or lower costs. Guha et al. (2023) defined medical tourism brand equity through a newly developed scale measuring dimensions such as brand awareness, perceived quality, loyalty, and associations. Their empirical analysis showed that these dimensions are crucial in assessing brand equity in emerging markets for medical tourism. Leelavathi et al. (2023) focused on the Technology Acceptance Model, indirectly addressing brand equity by discussing how customer acceptance of telemedicine applications affects perceptions of brand value, particularly in terms of usefulness and ease of use, which are components of brand equity.

Second, from the corporate perspective:

Brand equity is considered a resource that can generate cash flow or other financial value for a company, helping to establish a sustainable and differentiated strategic advantage in a competitive market. Simon and Sullivan (1993) define brand equity as the incremental present value of future cash flows that a brand-name product generates for a company compared to a product with identical functional attributes but without a brand name. Ishaq et al. (2014) define brand equity as the reputation and power of a brand that impacts an organization's financial performance. Wang and Sengupta (2016) argue that brand equity is largely viewed as the strategic outcome of branding, reflecting the strategic advantage a brand holds over its competitors. Parrish and Nevins (2023) discussed in their healthcare industry study how large-scale personalization strategies build brand equity in healthcare. They defined brand equity as the differential impact of brand knowledge on consumer responses to brand marketing. Their findings indicate that customized healthcare solutions can enhance consumers' perceptions of brand value and drive higher brand equity. Al-Hasan (2024) focused on how social media marketing enhances hospital brand equity. The empirical results show that effective social media marketing significantly improves brand equity by increasing brand awareness, brand associations, perceived quality, and ultimately customer loyalty. Srivastava (2012) proposed a hybrid model for understanding brand equity, combining traditional dimensions of brand equity (such as brand loyalty, awareness, perceived quality, and associations) with emerging digital influence dimensions, such as e-service quality and online customer reviews. The results highlight the complexity of brand equity in the modern business environment, emphasizing the need for brands to effectively manage both online and offline demands.

A review of the literature reveals that past studies have defined brand equity from both consumer and corporate perspectives, with a shared core understanding: brand equity represents the differentiated reflection of a brand in consumers' minds or market performance, which can enhance a company's consumer attention or market power. Thus, the choice of definition should depend on the specific scope of the research subject.

(2) Measurement of brand equity

Since research on the concept of brand equity is divided between consumer and corporate perspectives, the dimensions used to measure brand equity also vary depending on the perspective taken.

First, from the consumer perspective:

Aaker (2009) proposed that brand equity consists of five dimensions: brand awareness, brand associations, brand loyalty, perceived quality, and other proprietary brand equity. Netemeyer et al. (2004) suggested evaluating brand equity through four dimensions: willingness to pay a price premium, uniqueness, cost value, and perceived quality. Later, Tang et al. (2021), based on the Chinese cultural context, incorporated Confucian relational ties into the study of brand equity. They developed a brand equity measurement scale within the behavioral category, including dimensions such as belief in interaction, intimate interaction, emotional expression, happiness and joy, and inclusiveness. This approach broke away from the previous research paradigm centered on psychological and emotional constructs. Srivastava (2012) divided the measurement dimensions of brand equity into four main aspects: brand friendliness, emotionality, brand trust, and alignment with brand personality. These dimensions collectively form a multidimensional measurement framework for brand equity, aimed at exploring the contribution of brand equity to brand value from a consumer-based perspective.

Second, from the corporate perspective:

Simon and Sullivan (1993) advocated measuring brand equity through market capitalization by distinguishing the portion of stock market value driven by tangible assets from that driven by intangible assets. They further isolated the brand-driven portion of intangible assets by removing elements such as patents, which are unrelated to brand equity, to calculate the stock market value driven by individual brands. The international brand consultancy Interbrand measures brand value based on financial outcomes, primarily using indicators such as brand strength and brand net profit.

Both perspectives on measuring brand equity have their advantages and disadvantages. The consumer perspective emphasizes cognitive and emotional aspects, reflecting the core

source of brand equity, but it does not provide straightforward monetized value data. The corporate perspective focuses on market performance and sales outcomes, highlighting the impact of brand equity, but due to the numerous factors influencing metrics like stock price and cash flow, the data correlation can be somewhat limited. Therefore, this study chooses the consumer perspective as the method for measuring brand equity.

In the measurement of brand equity, the choice of measurement method directly affects the reliability and validity of research findings. Therefore, this study carefully considers the advantages and limitations of existing measurement tools and adapts them to the specific characteristics of private hospital healthcare services. Existing brand equity measurement tools primarily include Aaker's five-dimensional brand equity model and Netemeyer et al.'s four-dimensional brand equity model. While these models have been widely applied across various research fields, their applicability to the healthcare sector remains limited. For instance, Aaker's brand equity model is primarily designed for the fast-moving consumer goods industry, and its indicators may not fully capture the complex relationship between patients and hospital brands in a healthcare context. Similarly, Netemeyer et al.'s model focuses primarily on cost value and economic benefits, with less emphasis on patients' emotional and personalized needs. To address these limitations, this study adopts Srivastava et al.'s brand equity scale as its foundation and further refines it to align with the unique characteristics of private hospitals. Ultimately, four key dimensions—brand friendliness, emotionality, brand trust, and alignment with brand personality—were selected, comprising a total of 15 measurement items. This approach ensures a more comprehensive assessment of the key components of brand equity in private hospitals. The selection of this measurement method not only enhances the relevance of the study but also provides a more practical evaluation tool for brand management in private hospitals.

(3) Related research on brand equity

First, in the construction and management of brand equity:

In the healthcare and wellness industries, the construction and management of brand equity are crucial. Through a series of innovative studies, scholars have explored how to protect brand reputation in global supply chains, how to enhance medical tourism brand equity through the integration of culture and infrastructure, and how to optimize brand management in complex healthcare environments through strategic and empirical research. These studies emphasize a multidimensional perspective in constructing brand equity, including building brand equity through physician referral programs, enhancing brand acceptance through medical remanufacturing systems, and influencing physicians'

prescription behavior through effective marketing strategies.

Enyinda and Tolliver (2009) focused on the risks of counterfeit drugs infiltrating the global pharmaceutical supply chain and explored measures to prevent counterfeit drugs from entering legitimate supply chains. Considering patient welfare and the escalating costs of healthcare, this is a critical public health issue. The study revealed that while counterfeit drugs are a problem in both developing and developed countries, they are more prevalent in Nigeria. Effective partnerships and multilayered strategies are key to reversing this trend and closing the weak links in the supply chain. Ensuring the integrity and distribution of pharmaceuticals is not only crucial for brand equity and corporate reputation but also a matter of life and death. Guha et al. (2023) aimed to propose and validate a customer-based brand equity (CBBE) scale for the medical tourism sector in emerging economies. The study employed an extensive literature review and conducted empirical analysis and model validation using the lavaan package in R. The results introduced new observational variables and developed "infrastructure" and "culture" as new components of the CBBE scale, with "culture" serving as a moderating variable for "perceived quality." This provides a new theoretical perspective for evaluating brand equity in medical tourism. Mortezaei et al. (2021) sought to develop a model for health tourism brand equity in Iran. The study began with a meta-synstudy of previous research and then applied a mixed-methods approach for data analysis, including both qualitative and quantitative methods, using theory-based analysis and fuzzy analytic hierarchy process (Fuzzy AHP). The findings indicated that hospital brand equity is directly influenced by factors such as brand awareness, brand associations, and perceived quality, offering strategic guidance for Iran's ambition to become a leading global health tourism destination. Roy et al. (2018) focused on customer-based brand equity (CBBE) in Indian medical tourism, a topic of global interest. Through content analysis, the study generated a brand equity scale for medical tourism and explored the dimensions of brand equity under social, economic, and market influences. Research questions included how cultural and economic indicators, such as infrastructure/superstructure, are utilized in medical tourism. Supportive analysis of variables was conducted through questionnaire interviews from the literature review. The study analyzed content from two large hospitals in eastern India, examining why patients from Western countries and the Middle East choose other medical tourism destinations over India. Friedrich and Witt (1996) explored how hospitals attract physicians to join their networks through physician referral programs, particularly in the context of managed care and healthcare reform, where the relationship between hospitals and physicians has evolved. The study conducted an exploratory analysis of marketing strategies

used by 12 healthcare organizations representing 25 hospitals in a large city, with strategies ranging from practice acquisition to practice promotion. The findings indicated that healthcare providers might adopt consumer product branding strategies to secure market share, build brand equity, and increase profitability. The study provided insights into how hospitals can adapt and leverage marketing strategies in the current healthcare environment. Akano et al. (2021) analyzed and ranked the key factors influencing customer acceptance and use of remanufactured medical systems. Using the Analytic Hierarchy Process (AHP) model for pairwise comparisons, a structured decision hierarchy was subsequently established. The results indicated that product quality is the most critical factor influencing the acceptance of remanufactured equipment, followed by price, warranty, brand equity, available information, value-added services, and environmental friendliness. These findings provide a foundation for medical device remanufacturers to improve customer acceptance. Srivastava and Bodkhe (2020) explored the impact of brand equity on doctors' prescription behavior in India. Data were collected through a structured questionnaire from 261 respondents, revealing that brand equity plays a crucial role in influencing doctors' prescription decisions. Most doctors showed loyalty to branded generics due to their availability, low cost, and satisfactory efficacy. The study also highlighted that doctors tend to value promotional literature, including clinical trial results, offering the pharmaceutical and healthcare industries an opportunity to revisit traditional marketing strategies. Hui et al. (2022) conducted research on sustainable marketing policies and strategies and their impact on brand equity and sustainability in the healthcare sector. The study indicates that healthcare institutions can enhance their brand value and market performance through sustainable practices. Adhyka et al. (2019) evaluated the various dimensions of brand equity and the impact of word-of-mouth on customer purchase intentions in the healthcare sector. The study surveyed 115 patients at Ropanasuri Specialty Surgery Hospital in Padang, Indonesia, using convenience sampling and a cross-sectional design, and tested hypotheses using structural equation modeling (SEM). The results revealed that brand awareness, brand associations, perceived quality, and brand loyalty are crucial dimensions in constructing brand equity. Furthermore, brand equity and word-of-mouth significantly influence patients' purchase intentions. These findings highlight the importance of building strong brand equity dimensions in the highly competitive hospital services market. Rahman et al. (2022) aimed to explore the relationship between destination brand equity and tourists' revisit intentions in health tourism destinations, examining the mediating role of destination brand associations between destination brand equity and revisit intentions. Using covariance-based structural equation modeling (SEM) to analyze data from 246 respondents,

the study empirically found that destination brand equity influences tourists' revisit intentions through destination brand associations. Additionally, factors such as tourists' trust, reliability, and other soft factors moderated the relationship between destination brand equity and brand associations. This provides practical insights for brand management in health tourism destinations. Kumar et al. (2013) studied the impact of brand experience on hospital brand equity and assessed the effects of various brand equity dimensions on overall customer-based hospital brand equity. Through in-depth interviews with patients using hospital services in India, measurement items for each variable were developed, and 902 valid data points were analyzed using structural equation modeling (SEM). The study found that brand experience is a critical factor influencing hospital brand equity. The different dimensions of brand experience (sensory, emotional, behavioral, and intellectual) positively impact the five dimensions of brand equity (brand awareness, brand associations, perceived quality, brand trust, and brand loyalty).

Talarposhti et al. (2022) aimed to propose a model for health brand building from the perspective of service providers. The study encompassed both qualitative and quantitative phases, involving 20 academic and organizational experts as well as 415 service providers from healthcare centers. Using confirmatory factor analysis and structural equation modeling with EQS software, the results revealed that the health brand factor structure, based on six key themes (competitive position, brand equity, brand accessibility, brand consolidation in customers and markets, brand strategy, and consumer-brand relationship), demonstrated a good fit. The study emphasized that adopting and reinforcing these factors can achieve a competitive advantage in health brand building, enabling the provision of high-quality and profitable health services.

Elrod and Fortenberry (2018) explored the importance of brand building in the health services industry, particularly how hospitals can enhance brand equity through non-traditional brand expressions. By analyzing the extensive branding efforts of the Willis-Knighton Health System over several decades, the study detailed how the system promoted its brand through identity opportunities beyond traditional brand expressions. Specifically, it highlighted the development of the iconic Willis Bear mascot, created to promote labor and delivery services. This demonstrates that focusing on non-traditional brand elements can effectively enhance a hospital's market competitiveness. Karbalaei et al. (2013) identified five factors that influence the creation of brand equity through successful customer relationships: trust, customer satisfaction, relationship commitment, brand loyalty, and brand awareness. Through empirical testing with 318 customers of hospitals in the Tehran region and data analysis using structural

equation modeling (SEM), the results showed that trust, customer satisfaction, and relationship commitment positively impact brand loyalty and brand awareness. Additionally, these factors have a significant positive effect on the hospital's image. Kumar et al. (2018) proposed and empirically tested a new improved framework for creating customer-based brand equity (CBBE), advocating that CBBE should be created through customer experience (CE) rather than directly through market activities. The study involved qualitative interviews with patients and used structured questionnaires to interact with respondents and collect data. The findings indicated that CE is the central mediating variable in the relationship between market activities and CBBE. This work aids managers in creating service CBBE in trust services by designing appropriate activities to implement experiential marketing. Roy et al. (2018) aimed to create a unified, customer-focused brand equity (CBBE) scale for comparison in the global medical tourism market, particularly within BRICS and SAARC countries. The study conducted an extensive literature review, building on previous research and adding culture and infrastructure/superstructure as new comparative dimensions. Quantitative analysis using R revealed that culture (environment index) and infrastructure/superstructure (industry/economic index) are correlated in the CBBE scale for medical tourism. The study's limitations include the fragmentation of literature due to the international scope and diversity of medical tourism destinations and service types. This work laid the foundation for developing the CBBE scale for medical tourism in India and provided new directions for future research, such as fine-tuning new dimensions and brand assessment.

In summary, the aforementioned studies demonstrate that brand equity is not only an integral part of business strategy but also a core element of service quality and patient trust in healthcare institutions.

Second, application and impact of brand equity

The application of brand equity and its impact on organizational performance is a focal point of current research. Key issues include how brand equity translates into customer loyalty, improves service quality, and ultimately influences the financial performance of institutions in various healthcare settings. The literature covers topics ranging from how corporate social responsibility enhances hospital brand equity, to the role of brand experience in private healthcare institutions, and how social media strengthens brand awareness and promotes health applications. Additionally, it explores the role of brand equity in healthcare mergers, marketing strategies, and the re-semantization of social distancing during the pandemic.

Tuan (2012) analyzed the relationship between corporate social responsibility (CSR), leadership, and brand equity in Vietnamese hospitals. Through variance analysis and

structural equation modeling, the study found that transactional leadership is associated with legal and economic CSR, while transformational leadership fosters ethical CSR, which in turn positively impacts brand equity. The study also detected a direct link between transformational leadership and brand equity, providing new insights into the relationship between CSR, leadership, and hospital brand equity. Mahasuar (2019) analyzed the brand journey of Horlicks in India and the evolution of the Health Food Drink (HFD) category. By exploring the key reasons behind the slowdown of the HFD category and the decline of the Horlicks brand, the study traced nearly 100 years of strategic decisions and actions by its parent company, GlaxoSmithKline Consumer Healthcare. The study highlighted critical mistakes in distribution networks, brand extensions, and other areas that may have eroded Horlicks' brand equity. It offered insights into common pitfalls in brand development strategies and how to avoid them. Fong and Goh (2021) investigated the antecedents and outcomes of brand experience in private healthcare institutions, based on Aaker's brand equity model. Data collected through convenience sampling were analyzed using SPSS and Smart PLS. The study proposed six antecedents of brand equity, three of which were supported: perceived quality, brand loyalty, and brand attitude significantly and positively influenced brand equity. The study also confirmed that brand equity positively impacts customers' purchase intentions for health services in private healthcare institutions in Penang. Wang et al. (2011) aimed to create a hospital brand equity index, exploring why customers are willing to pay more for one hospital over another when both provide the same services. Drawing from brand equity literature and following index construction procedures, the study found that a concise five-indicator brand equity index could effectively capture the overall brand equity. The study also demonstrated the distinction between index construction and scale development, providing hospital managers with a highly accurate and practical tool for measuring brand equity. Salameh and Ali (2020) explored the impact of social media activities, such as personalized services and electronic word-of-mouth, on enhancing brand awareness of mobile health applications among Saudi citizens. By analyzing data from social media platforms like Twitter, Snapchat, and Facebook, the study found that personalization and electronic word-of-mouth positively and directly influence user awareness of mobile health applications. This indicates that social media activities are crucial for enhancing brand equity (brand awareness) and offer strategic guidance for marketing in the health industry. Mehra and Mishra (2021) discussed how the Indian healthcare market is expected to reach $372 billion by 2022, according to predictions by the India Brand Equity Foundation. Despite significant growth in the number of private hospitals in recent years, many struggle to attract

enough patients due to poor service quality, a lack of skilled healthcare workers, and unethical medical practices. This study surveyed 626 patients across three cities in northern India to explore their perceptions of doctor communication and how it influences doctor recommendations. The study found that good doctor communication leads to positive recommendations, with perceived impact and patient satisfaction playing significant roles in this process. Agarwal and Agrawalla (2017) examined the market mix strategies of Patanjali, a rapidly growing fast-moving consumer goods (FMCG) brand in India. Patanjali positioned itself as an authentic Ayurvedic brand with ancient Indian roots, leveraging the brand equity of Baba Ramdev. The brand's diversified entry into various market segments, such as beauty products, baby care, and sports products, showcased its strategic decisions in the FMCG industry. The study also explored how controversies involving Baba Ramdev could potentially impact Patanjali's brand equity and the brand's future without him, offering deep insights into brand management and market strategies in the FMCG sector. Kalhor et al. (2021) highlighted the challenge hospitals face in maintaining their status among patients in a highly competitive environment. This cross-sectional study aimed to identify the factors influencing hospital brand equity. After determining the effective factors on brand equity through expert panel meetings, a questionnaire survey was conducted with 450 inpatients in Kazin City. The causal relationships between variables were evaluated using structural equation modeling (SEM) with AMOS22 software. The results indicated a positive relationship between brand trust, brand loyalty, and brand equity.

Nair and Ahmad (2023) investigated the relationship between brand trust, customer brand engagement, and brand equity in private hospitals, and examined the moderating role of service quality during significant events. Data were collected through an online survey and analyzed using Smart PLS and SPSS software. The results indicated that in Malaysian private hospitals, brand trust is significantly related to customer brand engagement, which in turn significantly impacts brand equity. These findings provide insights for policymakers, the healthcare industry—particularly private hospitals—and academia, to identify and address influencing factors in the industry, thereby maintaining strategic competitiveness. Srivastava (2012) discussed the role of brand equity in pharmaceutical mergers and acquisitions, analyzing the cases of Daiichi-Ranbaxy and Pfizer-Wyeth. The "RKS" model and Inter-brand model were used to calculate brand equity, and the analysis results were applied to financial decision-making. The study demonstrated that although merger strategies are costly, they can quickly yield returns, such as entering new markets or securing a stronger position in existing markets. The research suggests that managers should exercise greater rationality when making

merger decisions. Haghbin et al. (2022) pointed out that during the coronavirus crisis, social distancing was re-semantized and globally legitimized to alleviate the strain on healthcare systems. This study explored the process of re-semantizing social distancing by creating brand value in the post-pandemic period. Through a mixed-method analysis of 124 brands from 2019 to 2021, the research revealed that although brand designers attempted to increase brand value through the re-semantization of social distancing, some aspects of brand discourse were overlooked. Sudirman and Sidin (2018) explored the impact of brand equity, value assets, and retention assets on customer lifetime value in public and private hospitals. The sample was drawn from Hasanuddin University Hospital (representing public hospitals) and Ibn Sina Hospital (representing private hospitals) in Makassar, Indonesia. The results indicated that brand equity is the primary variable for enhancing customer lifetime value in public hospitals, whereas in private hospitals, these factors did not show significant differences in their impact on customer lifetime value. This suggests that public and private hospitals exhibit different characteristics in market responsiveness, providing important guidance for strategy formulation and resource allocation. Kim et al. (2008) highlighted the unique challenges faced by global healthcare marketers, particularly in the context of the healthcare sector's contribution to public welfare. Marketing in South Korean hospitals is especially challenging due to legal restrictions that prohibit any form of advertising, forcing hospitals to rely heavily on customer relationship management (CRM). The study identified five factors that contribute to brand equity through successful customer relationships: trust, customer satisfaction, relationship commitment, brand loyalty, and brand awareness. Empirical testing indicated that if hospitals manage their customer relationships effectively, they can successfully create a positive brand image and brand equity. This provides practical strategies for hospitals to enhance brand value by strengthening customer relationship management (Dacan, 2019).

These studies collectively reveal that brand equity not only enhances a hospital's market competitiveness but also plays a critical role in maintaining long-term sustainability.

Third, research on the association with other variables

Service quality plays a central role in the construction and maintenance of brand equity, particularly in the healthcare services industry (Zameer, 2019). High-quality service not only enhances customer satisfaction but also strengthens brand reputation and customer loyalty, thereby directly influencing the growth of brand equity. Talarposhti et al. (2021) aimed to create a healthcare service brand model based on customer expectations. Using a mixed research method, the qualitative phase involved selecting 20 academic and institutional experts through snowball sampling and Delphi techniques, while the quantitative phase

included 830 healthcare center service recipients. Data were analyzed using confirmatory factor analysis and structural equation modeling with EQS software (Talarposhti et al., 2021). The results indicated that the brand-building model, based on the perspective of healthcare service customers, demonstrated a good fit, highlighting the importance of competitive position, brand equity, brand accessibility, brand consolidation, brand strategy, and consumer-brand relationships. AlSaleh (2019) explored the role of technological services in establishing brand equity in Kuwait's private hospitals. The study designed a survey questionnaire based on dimensions such as ease of use, electronic responsiveness, electronic environment, security, and personalization. The results showed that electronic responsiveness and security had a strong and direct impact on brand equity, while ease of use, electronic environment, and personalization had no significant positive effect on brand equity. This provides a potential model for hospital managers to establish brand equity by managing online service levels. Khosravizadeh et al. (2017) aimed to comprehensively review the factors of brand building in the healthcare services sector. The study retrieved relevant literature through various databases and assessed the quality of analytical studies using the SCORB checklist. A total of 54 study were selected for review, and the findings were reported based on three categories: dimensions, processes/strategies, and outcomes/benefits. The study concluded that brand equity is the most important dimension of brand building, brand positioning stability is the most critical process, and optimizing marketing development is the most significant outcome. Górska-Warsewicz (2022) sought to analyze the determinants of hospital brand equity from the perspective of consumers or patients, employing a systematic review and meta-analysis following the PRISMA statement. The study covered six databases and selected 32 studies for analysis. It was found that brand loyalty, perceived quality, brand associations, brand awareness, and brand image are traditional factors of hospital brand equity. Specific healthcare-related factors included patient satisfaction, service quality, perceptions of the treatment process, and the performance of medical staff. These results provide hospital managers with a deeper understanding of consumer behavior when choosing hospitals (Górska-Warsewicz, 2022).

Brand image is a critical element in constructing and maintaining brand equity, especially in highly competitive markets. A clear and positive brand image can significantly enhance consumer recognition and loyalty, thereby strengthening overall brand equity. Jawahar and Muhammed (2022) analyzed the relationship between the image of Ayurvedic tourism products in Kerala and destination brand equity, while also examining the influence of destination image (DI) and hospital brand image (HBI) and the mediating role of the overall

experience (TEX). Through primary data analysis of 342 tourists visiting Kerala for Ayurvedic treatment, the study found that product-place image (PPI) and DI significantly influenced brand equity, but HBI did not have a significant impact on brand equity. Although HBI did not directly affect Kerala's brand equity, it was strongly correlated through TEX. This study offers practical guidance for destination marketing organizations and tourism management authorities in formulating strategies for creating destination image. Jannah et al. (2024) aimed to analyze the impact of green brand image and green satisfaction on green brand equity among outpatient patients at hospitals in East Java, mediated by green trust. Using a quantitative method and explanatory research, the study conducted a survey with 100 patients selected through purposive sampling. Data analysis was performed using structural equation modeling (SEM), and the results indicated that green brand image and green satisfaction significantly and positively influenced green brand equity through green trust. This is significant for enhancing public awareness of green hospitals, helping to understand environmentally-friendly hospitals, and providing competitive advantages and long-term social stability for enterprises.

Brand awareness plays a crucial role in shaping and enhancing brand equity. High brand awareness not only increases consumer recognition but also serves as the foundation for building brand trust and loyalty. In a highly competitive market environment, brand awareness is essential for maintaining and enhancing brand equity. Das and Mukherjee (2016) aimed to develop a consumer-based brand equity (CBBE) measurement scale for medical tourism destinations (cities/hospitals). Through the traditional market construct development process (qualitative research, purification research, and validation research), the study evaluated two large and independent sample groups to assess the dimensions of the measurement. The results produced a well-validated measurement scale that integrates brand awareness, perceived quality, brand loyalty, and authenticity into four dimensions for evaluating the CBBE of medical destinations. This study provides guidance for healthcare administrators/managers to increase reliability, responsiveness, and tangibility to attract medical tourists.

In the field of brand management, the interaction between service quality, brand image, and brand equity constitutes the core of enhancing consumer trust and loyalty. In the healthcare industry, the interplay of these factors is directly related to the overall value and market performance of a medical institution's brand. Understanding these dynamic relationships helps private healthcare institutions formulate more effective branding strategies in a competitive market environment. Chahal and Bala (2012) examined three important

components of service brand equity—perceived service quality, brand loyalty, and brand image—and their relationships with each other and with brand equity. Through factor analysis and path modeling of data collected from 206 respondents in Jammu, India, the study found that service brand equity in the healthcare sector is greatly influenced by brand loyalty and perceived quality, while brand image indirectly influences service brand equity through brand loyalty. This study provides direction for healthcare service providers to create, enhance, and maintain service brand equity through service quality and brand loyalty, to maintain a competitive advantage.

2.2 Related theories

2.2.1 Health human capital theory

The theory of health human capital (Schultz et al., 2002) is an extension and application of human capital theory within the field of health. Based on the concept of health capital, it emphasizes that health, as a critical form of capital, changes in value and stock over time and with individual health behaviors. Health capital represents not only the physical well-being of individuals but also the foundation for labor productivity, quality of life, and societal contributions. Grossman (1972) pioneered the health human capital demand model in the field of health economics, providing a theoretical framework to understand the dynamic changes in health capital and its mechanisms of influence.

The concept of health capital (Schneider-Kamp, 2020) treats health as an investable and accumulable resource. Grossman (1972) argued that the stock of health capital is influenced not only by genetic factors but also by individual health behaviors that can either enhance or diminish it. For instance, positive lifestyle choices such as regular exercise, balanced nutrition, and avoiding smoking and excessive alcohol consumption can increase the stock of health capital. Conversely, unhealthy habits such as prolonged inactivity, heavy drinking, and smoking can lead to its depletion. Furthermore, the accumulation of health capital is time-dependent, with early investments in health having a more pronounced impact on future health status, underscoring the importance of health education and preventive health behaviors (Francis et al., 2023). The theory of health human capital views healthcare services as a fundamental form of health investment, with the aim of improving and maintaining the stock of health capital. Activities such as vaccination, routine health check-ups, or medical treatments are considered direct investments in health capital. This perspective provides an

economic explanation for medical behaviors, emphasizing the scarcity of health resources and the importance of their efficient utilization (Wang et al., 2019).

Grossman's health human capital demand model posits that an individual's stock of health capital is closely related to their quality of life, labor productivity, and life expectancy. Individuals invest in health capital through activities such as purchasing healthcare services, engaging in physical exercise, and improving their diet. The model frames health decisions as rational behaviors (Grossman, 2022), where individuals determine the level of health investment based on the marginal effects of health capital on their labor income and quality of life. For example, a working individual may choose to actively invest in health capital during their youth, such as participating in fitness programs, purchasing health insurance, and undergoing preventive screenings, as improved health capital directly enhances their work capacity and income potential. For older adults, health investments are more focused on disease management and maintaining quality of life. This characteristic of health capital illustrates that health investment behaviors vary across age groups and occupational backgrounds (Halliday et al., 2019).

Fuchs (1966) further extended the theory of health human capital, emphasizing that while healthcare services play a critical role in health, they are not equally effective for all illnesses. He noted that approximately 80% of diseases are self-limiting, meaning they can resolve without medical intervention, such as the common cold or mild gastrointestinal ailments. For such conditions, the role of medical services is limited. In contrast, the utility of medical technologies is more pronounced in treating severe or chronic illnesses. For instance, advanced medical interventions such as surgery and chemotherapy are primarily used for serious conditions and significantly improve the health capital of patients. This classification of the effectiveness of medical services explains why the allocation of medical resources should prioritize critically ill and high-risk populations. For self-limiting diseases, promoting health education and encouraging healthy behaviors may be more efficient than excessive reliance on medical services. Fuchs's research also highlighted the concept of "cost-benefit balance" in health investment, emphasizing that individuals and societies should allocate resources judiciously, prioritizing health issues with the highest returns on investment (Fuchs, 1966).

However, healthcare services, as a unique type of good, differ significantly from ordinary goods, with their most prominent characteristic being information asymmetry. This asymmetry primarily arises from the complex professional knowledge inherent in the medical field and the knowledge gap between physicians and patients. Li et al. (2020) pointed out that

the advantage of physicians in medical knowledge and diagnostic skills renders patients unable to effectively evaluate the quality of healthcare services. Patients often have limited understanding of their own health conditions, making it challenging for them to determine whether the healthcare services provided are necessary or meet expected outcomes. This phenomenon exacerbates the principal-agent relationship between physicians and patients, leaving patients in a passive position within the healthcare system.

Chi and Zhang (2024) further emphasized the issue of insufficient medical information disclosure, which makes patients' understanding of healthcare service quality and pricing even more ambiguous. In practice, patients largely rely on physicians' professional judgment when selecting treatment plans. However, physicians' recommendations may not solely be based on the health needs of the patient but can also be influenced by the interests of healthcare institutions or their own professional preferences. For instance, in highly commercialized healthcare systems, physicians may be inclined to recommend more profitable treatments, potentially leading to over-medicalization or resource wastage. Due to a lack of sufficient information and expertise, patients exhibit significant passivity in their demand for healthcare services. This passivity not only affects their medical decision-making but can also undermine their trust in healthcare institutions and physicians (Baim‑Lance et al., 2019).

From the perspective of health investment, the unique characteristics of healthcare services as a critical source for enhancing health human capital are particularly significant. According to Zhang and He (2024), health investment, by improving health human capital, generates not only substantial personal health benefits but also broader economic and social returns. For example, individuals who receive high-quality healthcare services and adopt healthy behaviors can achieve longer lifespans and greater labor productivity. At the societal level, improving public health can reduce the burden of medical expenditures and promote sustained economic growth. Health investment is not merely an individual responsibility but requires collective societal engagement. Healthcare providers, such as physicians and medical institutions, play a vital role in this process, as the quality of their services directly determines the efficiency and outcomes of health investment.

The distinctiveness of healthcare services lies in the fact that their quality and effectiveness depend not only on technical proficiency but also on the effects of information asymmetry and patient passivity. Patients' perceptions of healthcare service quality are often built on trust in physicians' professional competence, making physicians' service quality critical to health outcomes. Yükselm (2024) highlighted the importance of physicians' professional competence and ethics, noting that high-quality healthcare services have

long-term implications for patient health. Competent and ethically driven physicians can develop scientifically sound and tailored treatment plans based on patients' actual needs, thereby maximizing the value of health human capital. Conversely, if physicians lack professional competence or fail to prioritize patient interests, the quality of healthcare services can decline, potentially compromising patients' health capital (Søvold et al., 2021).

The issue of information asymmetry in healthcare services also poses challenges to the equity and efficiency of the medical system. When patients lack professional knowledge and the ability to make informed judgments, healthcare institutions and policymakers must adopt measures to mitigate the negative impacts of information asymmetry (Molina-Mula & Gallo-Estrada, 2020). Strengthening transparency in medical information and enhancing patient education to improve health literacy and decision-making capacity are crucial steps to alleviate the passivity of demand. Additionally, the introduction of independent third-party evaluation systems to provide objective assessments of healthcare service quality can offer patients more reliable sources of information. At the same time, governments and healthcare institutions should further promote the standardization and regulation of the healthcare industry (Sun & Medaglia, 2019). This includes developing standardized service procedures and strengthening oversight of physician behavior to reduce the occurrence of malpractice at a systemic level. Within the framework of health investment, the role of healthcare services extends beyond the treatment of diseases and maintenance of health to the long-term enhancement of the value of health human capital. Improving the quality of healthcare services requires not only technological advancements but also the establishment of a patient-centered care model. This necessitates comprehensive optimization of the healthcare system in terms of technology, ethics, and information transparency to ensure the maximum benefits of health investment (Pastorino et al., 2019).

2.2.2 Relationship marketing theory

Relationship marketing theory is a customer-centric marketing concept that emphasizes enhancing business performance by establishing and maintaining long-term, stable customer relationships (Hunt et al., 2006). As an integral part of modern marketing theory, relationship marketing has evolved from focusing on single transactions to emphasizing the long-term value of customer relationships. Its core objective is to enhance customer loyalty, thereby improving a firm's competitiveness and economic benefits.

In terms of its theoretical foundation, Berry (1983) was the first to define relationship marketing, arguing that its essence lies in maintaining and strengthening customer

relationships to ensure long-term loyalty. He emphasized that relationship marketing differs from traditional transaction-based marketing by prioritizing the overall value of the customer lifecycle over immediate transactional value. This perspective shifts the marketing focus from short-term gains to long-term benefits, laying a critical foundation for the development of relationship marketing theory. Morgan and Hunt (1994) further deepened the theoretical basis of relationship marketing by exploring the concepts of economic and social exchange. They identified trust as the core element of relationship marketing, highlighting its role in fostering emotional connections between customers and businesses, reducing customer uncertainty about products or services, and ultimately enhancing loyalty. For instance, in the service industry, customer trust stems not only from the quality of products or services but also from the transparency, reliability, and consistency demonstrated by businesses in their operations. Trust is a cumulative process, requiring companies to deliver consistently high-quality services and engage actively with customers to build and maintain it (Nemati et al., 2020).

Christopher et al. (2005) argued that the central idea of relationship marketing is to maximize customer loyalty, with improved service quality being a key factor in enhancing loyalty. High-quality services can exceed customer expectations, thereby increasing satisfaction and trust, which gradually transforms into loyalty. For example, in the hospitality industry, excellent customer service not only improves the customer experience but also encourages repeat patronage and fosters long-term brand advocacy. There is a significant causal relationship between service quality and customer loyalty. On the one hand, superior service enhances customer satisfaction, fostering greater trust in the company's performance. On the other hand, increased customer loyalty leads to more active recommendations of the company's services to others, attracting new potential customers. Christopher et al. (2005) noted that this loyalty driven by service quality not only helps businesses retain their existing customer base but also optimizes customer acquisition costs, thereby strengthening their market competitiveness.

In terms of the multifaceted value of customer loyalty, Wongsansukcharoen et al. (2022) further expanded on its role in relationship marketing. They argued that customer loyalty not only strengthens the bond between customers and businesses but also promotes widespread acceptance and support within the customer base. This loyalty contributes to business performance in several ways. First, it increases repeat purchase rates. Loyal customers are more likely to exhibit higher repeat purchase intentions, driven by their trust and satisfaction with the business (Afifi & Amini, 2019). They are less susceptible to competitors' pricing or promotional strategies. For example, in the retail industry, loyal customers maintain consistent

purchasing behavior and may even increase their purchasing frequency and expenditure over time. Second, loyalty enhances brand advocacy. Loyal customers often become brand ambassadors, influencing others' purchasing decisions through word-of-mouth recommendations. In the digital age, their reviews and endorsements on social media platforms significantly amplify brand exposure and reputation. Third, loyalty reduces customer attrition rates. By strengthening customer loyalty, businesses can significantly lower churn rates. Retaining existing customers is typically more cost-effective than acquiring new ones. The loss of loyal customers not only results in direct revenue losses but can also negatively impact brand image (Abbas et al., 2021) and market share. Therefore, enhancing customer loyalty is essential for ensuring the long-term stability and growth of a business.

In the practice of relationship marketing, implementing effective strategies requires businesses to adopt a customer-centric approach, designing marketing initiatives to meet the diverse needs of their clients (Čavlin et al., 2024). For example, companies can foster long-term customer relationships by offering personalized services, establishing robust feedback mechanisms, and launching loyalty reward programs. However, the implementation of relationship marketing is not without challenges. It demands consistent investment of time and resources to maintain customer relationships and requires the development of scientific evaluation systems to measure the actual contribution of customer loyalty to business performance (Khan et al., 2022). Additionally, in highly competitive markets, customers' expectations for products and services are continually rising. Businesses must maintain their capacity for service innovation to adapt to changing customer needs. For instance, e-commerce platforms enhance customer experience and satisfaction through personalized recommendations and tailored customer support, yet these advancements place higher demands on companies' data analytics capabilities and technological infrastructure (Felix & Rembulan, 2023).

In the healthcare industry, the importance of relationship marketing is particularly pronounced. As a service-oriented sector, healthcare not only needs to address patients' health needs but also relies on strong doctor-patient relationships to build trust and loyalty. Such relationships are based not only on physicians' professional expertise but also on the care and responsibility demonstrated during the service process by both doctors and healthcare institutions. With the rapid development of the healthcare industry, particularly amid the increasingly intense competition faced by primary healthcare providers, relationship marketing has become a critical strategy for enhancing institutional competitiveness and brand influence.

Brand equity plays an increasingly significant role in the healthcare industry (Fong & Goh, 2021). Zhu (2024) highlights that brand equity is a key factor influencing the utilization of primary healthcare services. Building strong brand equity can significantly enhance patients' trust and loyalty to healthcare services, thereby improving the competitive position of healthcare institutions. For primary healthcare providers with relatively limited resources, establishing brand equity is especially crucial. A healthcare institution with a strong brand image can attract and retain patients more effectively. For example, when selecting healthcare services, patients are often inclined to choose institutions with a strong reputation and brand influence, reflecting the value of brand equity. However, building brand equity is a long-term process that requires sustained effort and the consistent delivery of high-quality services. The unique characteristics of the healthcare market make trust a central element in the development of brand equity. Due to the technical and professional nature of healthcare services, patients' understanding and evaluation of the medical process often depend on their trust in doctors and healthcare institutions. This trust stems not only from physicians' professional competence but also from the institution's service attitude, transparency in diagnosis and treatment, and follow-up care (Wu et al., 2022).

The issue of information asymmetry, a common challenge in the healthcare industry, exacerbates the tension in doctor-patient relationships. Information asymmetry refers to the knowledge and professional gaps between doctors and patients, which prevent patients from fully understanding the content, effectiveness, and necessity of medical services. This imbalance not only heightens conflicts in doctor-patient interactions but also negatively impacts patients' healthcare experiences and decision-making. Liu et al. (2022) point out that patients' desire for medical information and informed participation is key to reducing uncertainty and fostering engagement. When patients lack sufficient information or have doubts about their treatment plans, they may experience anxiety or dissatisfaction. Furthermore, Wang et al. (2016) studied the negative impact of dissatisfaction on healthcare service experiences, revealing that patients' dissatisfaction with service quality often causes irreversible damage to the brand image of healthcare institutions. In today's fast-paced information dissemination environment, negative events can quickly spread through social media, triggering a chain reaction that undermines the reputation of healthcare providers. Thus, addressing information asymmetry through effective communication and transparent healthcare services is a priority for healthcare institutions within their relationship marketing efforts (Major, 2019).

In the field of healthcare services, the application of relationship marketing is not only a

means to improve service quality but also a critical strategy for addressing information asymmetry and building trust. Healthcare institutions can effectively implement relationship marketing through the following approaches (Fatima et al., 2019): First, improving service quality. High-quality healthcare services form the core foundation of relationship marketing. Superior service enhances patient satisfaction and trust, thereby promoting patient loyalty. For instance, optimizing diagnostic and treatment processes, improving the attitudes of medical staff, and reducing waiting times can all enhance patients' service experiences. Second, building brand equity. Healthcare institutions need to enhance their brand image through consistent high-quality services, successful treatment cases, and proactive social responsibility initiatives. For example, some institutions hold health seminars (Hariyanti et al., 2023) and offer free medical consultations to strengthen public recognition of their professional competence and social responsibility, thereby accumulating brand equity. Third, transparency and communication. By increasing information transparency and improving doctor-patient communication, healthcare institutions can effectively mitigate the negative impact of information asymmetry on patient decision-making and experiences. Physicians can provide detailed explanations of treatment plans, associated risks, and expected outcomes to help patients better understand and participate in the medical process (Stewart, 2024). This not only enhances patients' right to information but also strengthens their trust in doctors. Fourth, increasing patient engagement. Patient involvement is one of the key factors for successful relationship marketing. By enhancing patients' sense of participation and recognition in healthcare services, institutions can further improve patient satisfaction and loyalty. For instance, physicians can invite patients to participate in decision-making when developing treatment plans and listen to their opinions and needs. This sense of involvement fosters a sense of ownership among patients, making them more willing to establish long-term relationships with physicians and healthcare institutions (Holmes et al., 2019).

2.2.3 Consumer perspective-based brand equity theory

(1) Aaker's brand equity model

Aaker (1991) proposed the five-dimensional model of brand equity, comprising brand associations, perceived quality, brand loyalty, brand awareness, and other proprietary brand assets. This model systematically identifies the components of brand equity and captures its multidimensional attributes from the consumer's perspective.

First, brand associations.

Brand associations refer to the thoughts, memories, and perceptions that consumers

develop when encountering a brand. These associations may include functional attributes, emotional values, or social imagery. Brand associations enhance consumer recognition of the brand and establish its unique positioning. For example, Nike's "Just Do It" slogan has created strong associations with athletic spirit, deeply embedding its brand image in consumers' minds.

Second, perceived quality.

Perceived quality refers to the consumer's subjective evaluation of a brand's product or service quality. Aaker identified perceived quality as a core component of brand equity because it directly influences consumer purchase decisions and satisfaction. For instance, Apple has established strong brand equity in the electronics sector through its exceptional perceived quality, which resonates with its customers.

Third, brand loyalty.

Brand loyalty reflects the consumer's tendency to consistently choose a particular brand over competitors. Highly loyal customers not only provide stable revenue streams but also attract new customers through word-of-mouth advocacy. For example, Starbucks' loyal customer base plays a critical role in sustaining its brand equity, as repeat customers not only make frequent purchases but also actively promote the brand.

Fourth, brand awareness.

Brand awareness represents the extent to which consumers recognize and recall a brand. It serves as the foundation of brand equity since familiar brands are often prioritized during purchase decisions. Coca-Cola, for example, maintains a dominant position in the beverage market through its high global brand awareness.

Fifth, other proprietary brand assets.

This dimension encompasses intangible assets such as patents, trademarks, and distribution channels that influence brand equity. Although these assets do not directly reflect consumer perceptions or behaviors, they provide significant support for brand performance in the market. For instance, Louis Vuitton's trademarks and design patents are vital components of its brand equity in the luxury sector.

Aaker's brand equity model has several strengths, including its rich content and clear structure, which comprehensively reveal the different dimensions of brand equity. It captures consumers' emotional, cognitive, and behavioral responses to brands, offering researchers and brand managers a multifaceted framework to understand the sources of brand value. For example, brand associations and perceived quality reflect consumers' emotional and cognitive perceptions of the brand, while brand loyalty and awareness represent their behavioral

responses. By integrating these dimensions, the model provides a systematic tool for brand management. Furthermore, Aaker's model emphasizes the importance of brand associations and perceived quality in shaping brand equity. Brand associations, by imbuing a brand with unique emotional or functional value, help it stand out in competitive markets. Perceived quality establishes a foundation of trust between the brand and its consumers, fostering brand loyalty.

Despite its widespread application, Aaker's model has several limitations. First, it lacks operational specificity, as it does not provide concrete scales or metrics for measuring brand equity. Researchers often need to develop additional tools to measure brand equity, increasing the complexity of its practical application. Second, the model does not fully account for industry-specific variations. The composition of brand equity may differ across industries; for instance, brand awareness might be crucial in fast-moving consumer goods (FMCG), while brand associations and perceived quality may play a more significant role in luxury goods. Consequently, the model's generalizability may be limited in industry-specific brand studies (Dacan, 2019). Finally, Aaker's model focuses predominantly on the consumer perspective and pays less attention to relationships with other stakeholders, such as suppliers and distributors. This consumer-centric approach may result in a narrow evaluation of brand equity in complex business environments, failing to comprehensively reflect a brand's true market value.

(2) Keller's brand equity model

Keller (1993) proposed the Customer-Based Brand Equity (CBBE) model, representing a significant advancement in brand equity theory, by defining the core of brand equity as consumers' knowledge of a brand. He argued that brand equity originates from the brand knowledge stored in consumers' minds, which primarily consists of brand associations and brand awareness. This model emphasizes that brand associations and awareness are not only critical components of brand equity but also key factors influencing consumer purchase decisions and brand preferences.

Brand awareness refers to the extent to which consumers recognize and recall a brand. Keller (1993) posited that brand awareness is the foundation of brand equity, as consumers must first be familiar with a brand before they can form associations with it. Awareness can be enhanced through advertising, promotions, and social influence. For instance, Coca-Cola has achieved exceptionally high brand awareness through its global advertising campaigns and frequent market exposure. Brand associations refer to the impressions and connections consumers have with a brand, encompassing functional, emotional, and symbolic attributes.

For example, Apple's brand associations include not only its high-tech image but also attributes like minimalist design, innovation, and user-friendliness. Keller highlighted that strong and unique brand associations can create a differentiated advantage for brands, increasing consumer preference and loyalty.

Keller (2001) further elaborated that brand knowledge shapes consumer responses to a brand and is a core element of brand equity. He subsequently introduced the Brand Equity Pyramid model, which provides a detailed explanation of the brand-building process. This model divides brand building into four stages, each with a distinct goal: Brand Identity—the base of the pyramid focuses on establishing brand awareness, aiming to ensure that consumers can recognize and recall the brand. This stage emphasizes the visibility and memorability of the brand, achieved through prominent logos, slogans, and promotional activities. Brand Meaning—at this stage, the brand conveys its core values and functional and emotional benefits to consumers. Building brand meaning is accomplished by shaping consumers' associations with the brand. Brand Response—this stage addresses consumers' attitudes and evaluations of the brand, including perceptions of quality, satisfaction, and trust. High-quality products and services enhance consumer satisfaction, strengthening brand equity. Brand Resonance—at the top of the pyramid, brand resonance signifies the establishment of a deep emotional and psychological connection between the brand and consumers. This represents the ultimate goal of brand building, marked by brand loyalty. Manifestations of brand resonance include repeat purchases, active recommendations, and emotional attachment to the brand (Sastrina et al., 2023).

Keller's brand equity model holds significant theoretical value. First, it systematically identifies the sources of brand equity, emphasizing the pivotal role of brand awareness and associations in consumer decision-making. Second, the pyramid model offers a clear pathway for brand building, guiding firms to optimize their brand strategies step-by-step from brand identity to brand resonance. However, the model also has certain limitations in practice. Keller (2001) did not provide explicit operational scales, making it challenging to measure brand equity accurately. For instance, determining the depth and strength of brand associations or quantifying brand resonance requires additional tools developed by researchers and businesses. Furthermore, the model does not fully account for industry and cultural differences. In the fast-moving consumer goods (FMCG) sector, brand awareness may hold greater importance than brand associations, whereas in the luxury goods industry, consumers are more focused on the unique values conveyed by brand associations.

(3) Yoo and Donthu's brand equity model

Yoo and Donthu (2001) proposed the three-dimensional model of brand equity, which has made significant theoretical contributions to the field of brand research. Based on empirical studies, the model identifies perceived quality, brand awareness, and brand loyalty as the three core dimensions of brand equity. Compared to earlier brand equity theories, Yoo and Donthu's model integrates these essential elements into a more practical framework and provides tools for quantitatively measuring brand equity, making it a critical model in brand research and management.

Regarding perceived quality, this dimension represents consumers' overall evaluation of the quality of a brand's products or services. Yoo and Donthu argue that perceived quality is a core component of brand equity because it directly influences consumer trust and satisfaction (Aaker, 1991). For example, consumers' positive perceptions of the quality of Sony electronics reinforce its brand image and enhance its brand equity. Similarly, Zeithaml (1988) highlights that perceived quality drives consumer purchase intentions and loyalty, serving as a key factor in building brand equity.

In terms of brand awareness, this dimension reflects the extent to which consumers recognize and recall a brand, making it a foundational element of brand equity. Yoo and Donthu emphasize that brand awareness is closely linked to brand associations, together shaping consumer memory and preference for the brand. For instance, Coca-Cola has solidified its high global brand awareness through continuous advertising and marketing activities. Keller (1993) also points out that brand awareness lays the groundwork for brand associations and loyalty by increasing brand exposure and deepening consumer recognition.

As for brand loyalty, it reflects consumers' tendency to repeatedly choose a specific brand over competing alternatives, making it a vital component of brand equity (Oliver, 1997). Yoo and Donthu note that brand loyalty not only directly enhances the value of brand equity but also amplifies the brand's market influence through repeat purchases and word-of-mouth recommendations. For example, Apple has cultivated a large base of loyal customers whose repeat purchases and advocacy significantly strengthen the brand's competitive position. Chaudhuri and Holbrook (2001) further argue that loyalty is a core element of brand equity because it ensures stable growth in competitive markets.

Yoo and Donthu developed a comprehensive brand equity measurement scale in their research, encompassing specific indicators for these three core dimensions. This scale provides a highly actionable tool for quantifying brand equity, enabling researchers to empirically assess its strength and impact on consumer behavior. For example, their scale systematically evaluates brand equity by examining consumers' perceived quality, recognition

of the brand name, and loyalty tendencies. This innovation has been widely acknowledged for its theoretical and practical significance.

The Yoo and Donthu brand equity model offers notable advantages in both theoretical and practical applications. First, it simplifies the structure of brand equity by focusing on the three core dimensions of perceived quality, awareness, and loyalty, making the model more intuitive and applicable. Second, the measurement scale developed by Yoo and Donthu provides a reliable tool for quantitative brand equity research, addressing the lack of practical application in many theoretical models. Additionally, the incorporation of a cross-cultural perspective enhances the model's broader applicability, offering valuable insights for international brand management. However, the model also has certain limitations. For instance, it does not fully address the impact of emerging brand touchpoints in the digital age, such as social media. Furthermore, the role of brand associations is relatively underemphasized in the model, despite their importance for brand differentiation and emotional connection with consumers (Keller, 2001).

The three brand equity models each have distinct characteristics. The model of Aaker (1991) is comprehensive, emphasizing the importance of brand associations and perceived quality. However, it lacks practical measurement scales and does not fully account for industry-specific differences. The model of Keller (2011) focuses on the impact of brand knowledge and highlights the hierarchical nature of brand building, as elaborated in his Brand Equity Pyramid. This model provides a detailed step-by-step process for brand development. Nevertheless, like Aaker's model, Keller's framework also faces the challenge of lacking actionable measurement scales. The model of Yoo and Donthu (2001), on the other hand, establishes effective measurement tools through empirical research and emphasizes the roles of perceived quality and brand loyalty. It further refines the dimensions of brand equity measurement and considers the influence of cultural differences on brand evaluation, making it highly practical and quantifiable. Each brand equity model is suited to different research domains and practical applications. Researchers can select the most appropriate model for measuring and managing brand equity based on their specific needs and contexts.

2.3 Critical literature review

Existing research provides rich theoretical and empirical support for the areas of healthcare service quality, brand image, brand awareness, brand loyalty, brand equity, and patient involvement in the context of private hospitals. A substantial body of literature explores how

these factors individually influence hospital brand development and patient behavior. For instance, studies show a significant positive relationship between healthcare service quality and patient satisfaction, with improvements in service quality directly enhancing patients' recognition and loyalty towards the hospital brand. At the same time, brand image and brand awareness are considered crucial components of brand equity. A positive brand image can increase patients' trust and preference for the hospital, while higher brand awareness attracts more patients, thereby enhancing the hospital's competitiveness. Furthermore, brand loyalty is regarded as a key driver of brand equity, as a loyal patient base not only boosts the hospital's brand value but also contributes to long-term profitability and growth. Regarding patient involvement, research indicates that emotional and cognitive engagement plays a significant role in healthcare decision-making. These studies provide a theoretical framework and empirical evidence for hospital brand management, laying the foundation for a deeper understanding of the mechanisms underlying hospital brand equity formation.

Despite the rich perspectives offered by existing literature on private hospital brand equity, there are certain gaps in the comprehensive analysis of the relationships between healthcare service quality, brand image, brand awareness, brand loyalty, and brand equity. Much of the existing research tends to focus on the influence of individual factors, such as healthcare service quality or brand image, on brand equity, without systematically analyzing the interactions between multiple dimensions of brand equity. For instance, there is limited exploration of how healthcare service quality, brand image, brand awareness, and brand loyalty collectively contribute to the formation of brand equity. The lack of such an integrated theoretical framework limits the practical applicability of the findings, especially in the context of hospital brand strategy development, where balancing the influence of various brand equity dimensions has not been sufficiently explored.

Moreover, most studies neglect the moderating role of patient involvement in the relationships between healthcare service quality, brand image, brand awareness, brand loyalty, and brand equity. Patient involvement, as a crucial factor influencing patient behavior, may play a key moderating role in the process of brand equity formation. However, existing literature lacks in-depth analysis of this aspect, particularly in terms of how different levels of patient involvement might alter the impact of brand image, brand loyalty, and other factors on brand equity. The absence of clear theoretical hypotheses and empirical evidence on this issue presents an opportunity for this research to address this gap.

To fill the gaps in the existing literature, this study adopts a more comprehensive and systematic research framework, integrating the relationships among healthcare service quality,

brand image, brand awareness, brand loyalty, and brand equity, while also exploring the moderating role of patient involvement in these relationships. The study constructs an integrated hypothesis model to examine how healthcare service quality, brand image, brand awareness, and brand loyalty jointly influence brand equity, and how patient involvement moderates these relationships. Compared to previous research, the innovation of this study lies in its focus not only on the independent effects of each dimension of brand equity but also on the interactions between these dimensions, providing a more holistic theoretical guide for hospital brand management.

In summary, by integrating the relationships between healthcare service quality, brand image, brand awareness, brand loyalty, and brand equity, and exploring the moderating role of patient involvement, this study addresses the limitations in multi-dimensional analysis found in existing literature. Through this research, the study not only expands the theoretical framework of hospital brand management but also provides scientific support for the practical development of brand strategies in private hospitals.

Chapter 3: Hypotheses and Construction of the Research Model

3.1 Research hypotheses

3.1.1 The relationship between private hospital service quality and brand equity

Parasuraman (1985) found that service quality not only influences customer satisfaction but also significantly enhances customer loyalty. Specifically, consumer loyalty tends to strengthen as service quality improves, indicating that service quality directly impacts consumers' long-term preference and loyalty toward a brand. For private hospitals, delivering high-quality medical services aids in establishing stable brand equity, leading to increased patient preference for the hospital's brand in future choices. Similarly, Frederick (1996) suggested that improved service quality can help firms secure more loyal customers, a finding equally applicable to the healthcare sector, where high-quality services effectively bolster patient brand loyalty and brand image.

Kandampully (1998) argued that high-quality service significantly enhances customer loyalty, which is particularly critical for private hospitals as patient loyalty serves as a key determinant of their long-term competitiveness. This is because patients' choice and reliance on a hospital are often built on their service experience, and exceptional service can generate positive word-of-mouth, further strengthening the hospital's brand influence.

Service quality indirectly contributes to the growth of hospital brand equity by increasing patient satisfaction and loyalty. Zeithaml (1996) highlighted that service quality significantly impacts patients' brand preferences and loyalty. A high-quality service experience not only enhances patients' trust in the hospital but also guides them toward forming positive brand intentions. For example, when patients perceive superior performance in terms of professional expertise, service attitude, and facility quality, they are more likely to select the hospital as their first choice and continue using its services. These positive brand intentions ultimately translate into contributions to the hospital's brand equity, enabling the institution to secure a competitive advantage.

Butcher (2000) further validated the positive correlation between service quality and brand loyalty through empirical research. His findings demonstrated that high-quality service not only improves patient loyalty but also plays a crucial role in building and reinforcing hospital brand equity. For private hospitals, this effect is particularly pronounced. By

delivering superior medical services, hospitals can earn patients' trust and satisfaction, creating a stable customer base through loyal behaviors. In the highly competitive private healthcare market, this loyalty serves as a vital foundation for building brand reputation and ensuring sustainable development.

Specifically, the impact of service quality on brand equity can be observed in the following aspects:

First, high-quality service enhances a hospital's brand image. A hospital's brand image reflects patients' overall perception of the institution, which largely stems from their service experiences. Factors such as the professionalism of medical staff, the friendliness of service attitudes, and the comfort of hospital environments directly influence patients' perceptions of the brand. By continuously improving these service elements, private hospitals can establish a professional and trustworthy brand image in the minds of patients (Hoşgör & Sevim, 2022).

Second, service quality strengthens patient loyalty, thereby stabilizing the foundation of brand equity. Loyalty is not only reflected in patients' repeat visits but also in their word-of-mouth promotion through social networks. Satisfied patients are more likely to recommend the hospital to others, and this word-of-mouth effect effectively expands the hospital's brand influence, attracting more potential patients (Akbolat et al., 2021).

Finally, improved service quality facilitates the transformation of patient brand intention. Brand intention refers to patients' inclination to choose the hospital for future services. When patients form positive evaluations of a hospital's service quality, they are more likely to choose the hospital again when needed. This inclination provides a stable source of revenue for the hospital over the long term and contributes to the development of robust brand equity (Pina & Dias, 2021).

Research has shown a significant positive relationship between service quality and hospital brand equity. By enhancing service quality, private hospitals can not only directly meet patient needs but also elevate brand value through multiple channels. Measures such as optimizing medical service processes, improving patient experiences, and providing personalized services can significantly enhance patients' trust and loyalty toward the hospital. This increase in brand value is reflected not only in the growth of patient numbers but also in the overall improvement of the hospital's market competitiveness (Gok & Burckin, 2020).

In summary, high-quality service is the core driving force behind the establishment of brand equity for private hospitals. By continuously optimizing service quality, private hospitals can stand out in the competitive market and create a strong brand value network. This network is built not only on patient loyalty but also on their recognition and

recommendations of the hospital's brand, ultimately driving sustainable development for the institution (Cham et al., 2022).

Therefore, this study proposes the following hypothesis:

H1: Medical service quality of private hospitals has a significant positive impact on brand equity.

3.1.2 The relationship between brand image and brand equity in private hospitals

Brand image plays a crucial role in the development of brand equity for private hospitals. Kim et al. (2008) emphasized that a strong brand image significantly enhances patients' recognition of hospital services, while also improving their trust and loyalty. Brand image is not merely an external representation of the hospital but also directly influences patients' trust and long-term commitment, which are critical components of brand equity. Patient trust and loyalty are essential for the sustainable growth of a hospital's brand, as high levels of loyalty contribute to building robust brand equity.

Lee et al. (2015) highlighted the direct positive impact of brand image on patients' trust and commitment. A high-quality brand image strengthens patients' emotional connection with the hospital, fostering greater loyalty and trust during their decision-making process. This emotional connection establishes a solid foundation for the accumulation of hospital brand equity.

The construction of a strong brand image is a multidimensional process that encompasses not only service quality but also the hospital's reputation, public image, and patients' emotional experiences. Service quality is a core element in brand image building, as it directly shapes patients' perceptions through the provision of professional, efficient, and compassionate medical care (Asnawi et al., 2019). Meanwhile, the hospital's reputation and public image also play vital roles. Factors such as transparency in handling medical incidents, participation in social welfare initiatives, and protection of patient rights add significant value to the hospital's brand image. A strong brand image enhances the hospital's standing in the minds of patients, thereby increasing their trust and loyalty, and contributing to the growth of brand equity (Iglesias et al., 2019).

Rousta et al. (2015) further emphasized the importance of relationship quality between patients and hospitals in shaping brand image. In the healthcare sector, relationship quality reflects the interactive experiences between patients and the hospital while also indicating patients' satisfaction and trust in the hospital's services. Relationship quality is a critical foundation for brand image building, as high-quality relationships significantly enhance

patients' sense of recognition and belonging toward the hospital. For instance, effective communication between medical staff and patients, attention to patients' emotional needs, and personalized medical services improve relationship quality (Burgener, 2020). The strength of a hospital's brand equity directly influences patients' long-term behavioral choices, as a strong brand image often encourages patients to consistently select the same hospital for ongoing medical care. Such long-term selection behavior not only stabilizes the hospital's patient base but also ensures the sustained accumulation of brand equity.

Maulana and Ayuningtyas (2023) further validated the key role of brand image in enhancing patients' trust and satisfaction. They argued that a strong brand image builds patients' trust in the hospital, directly influencing their willingness to seek care. For instance, when a hospital establishes a professional and trustworthy image among its patients, they are more likely to choose the hospital for future treatments. This trust not only improves patient satisfaction but also enhances the hospital's market appeal, forming a strong foundation for brand equity.

The strength of a hospital's brand image directly impacts its market competitiveness. A stronger brand image enables a hospital to attract more potential patients while retaining the loyalty of existing ones. For instance, in the high-end healthcare market, hospitals with a robust brand image are often perceived as symbols of professional service, advanced facilities, and superior patient experiences, earning higher recognition among patients (Ariffin et al., 2022). Moreover, a strong brand image fosters emotional connections with patients, enhancing their loyalty and willingness to recommend the hospital, thereby attracting additional prospective customers.

In addition, brand image can further enhance brand equity through word-of-mouth effects. Satisfied patients are more likely to recommend the hospital to friends and family, generating positive word-of-mouth that expands the hospital's brand awareness and reinforces its brand image. For example, in contexts where medical incidents are frequent and patient trust is generally low, hospitals with a strong brand image stand out, attracting patients who are particularly sensitive to the quality and safety of medical services. This accumulation of trust helps hospitals establish a unique competitive advantage in a highly competitive market and ensures the sustained growth of their brand equity (Pandiangan et al., 2021).

For private hospitals, shaping and maintaining a strong brand image is a critical factor in enhancing brand equity. A positive brand image not only improves patients' trust and satisfaction but also strengthens the hospital's market competitiveness, enabling it to secure a favorable position in a highly competitive market. By cultivating a positive brand image,

hospitals can effectively increase patient loyalty, thereby achieving a sustainable advantage in the marketplace (Vimla & Taneja, 2020).

H2: Brand image of private hospitals has a significant positive impact on brand equity.

3.1.3 The relationship between brand awareness and brand equity in private hospitals

Research has shown that variations in brand awareness influence consumers' decision-making processes and brand perceptions. When brand awareness is high, consumers tend to trust the brand more, while perceived risks are relatively lower. In the private hospital sector, enhancing brand awareness can strengthen patients' trust in the quality of hospital medical services, thereby increasing both brand loyalty and brand equity. Samiee (1994) pointed out that when patients are less familiar with a brand, they tend to hold higher evaluations of well-known hospitals, increasing the likelihood of choosing these hospitals. Wu (2005) also found that high brand awareness signals greater perceived quality and lower functional risks, thereby increasing patients' willingness to choose a hospital.

High brand awareness not only reduces patients' psychological burden but also enhances their brand loyalty, which is crucial for the accumulation of hospital brand equity. Nie (2015) demonstrated that brand awareness significantly reduces patients' perceived risks. When selecting medical services, patients often face a degree of perceived risk due to a lack of sufficient understanding of medical quality and the service process. Hospitals with high brand awareness, supported by broad social recognition and a strong market reputation, provide patients with greater trust assurance. This trust assurance makes patients more inclined to rely on well-known hospital brands, thereby reducing psychological uncertainty (Limbu et al., 2020).

Liu (2018) emphasized that high brand awareness significantly improves patients' perceived value. In the healthcare sector, patients often view high-awareness hospitals as symbols of high-quality services. This perceived value strengthens patients' trust and loyalty toward the hospital. For instance, when patients choose a well-known hospital, they are more likely to associate it with advanced medical technologies and professional healthcare staff, making them more willing to accept its services. This heightened value perception not only alleviates patients' psychological burdens but also enhances their psychological comfort during medical visits, ultimately leading to higher satisfaction and loyalty. Satisfied patients are more likely to return to the same hospital and promote it through positive word-of-mouth, attracting additional potential patients and further expanding the hospital's brand equity (Górska-Warsewicz, 2022).

Zhang (2021) supported this perspective, finding that high brand awareness significantly improves patient satisfaction and stimulates their willingness to return. This increased satisfaction stems not only from patients' recognition of the hospital's service quality but also from their trust and psychological reliance on well-known brands. In the private healthcare market, patients often prioritize hospitals with a strong brand image and broad market coverage, as these hospitals inspire a greater sense of reassurance and reliability. Patient satisfaction directly influences their repeat visit behavior, which is one of the core factors driving the accumulation of brand equity.

Moreover, Wu et al. (2022) further explored the relationship between brand awareness and brand equity from the perspective of interactive experiences. They found that high brand awareness enhances patients' interaction experiences with hospitals, thereby improving patient engagement and satisfaction. For instance, well-known hospitals often excel in patient education, service process optimization, and the design of interactive activities. These factors significantly enhance patient engagement and the quality of their experiences (Lee, 2019). When patients establish a positive interactive relationship with a hospital, their loyalty to the hospital's brand deepens further. This interactive pathway not only fosters the growth of hospital brand equity but also attracts more patients through word-of-mouth promotion and recommendation effects, driving the sustained development of the hospital's brand. The contribution of brand awareness to hospital brand equity is also evident in its market competitiveness (Moise et al., 2019). Recognized brands can leverage their high visibility and market reputation to attract greater patient traffic.

In summary, brand awareness plays a critical role in the formation and development of brand equity for private hospitals. By reducing patients' perceived risks, enhancing their perceived value and satisfaction, and strengthening their interactive experiences with the hospital, brand awareness significantly increases patients' loyalty and trust in the hospital. Furthermore, the word-of-mouth effects and market competitive advantages associated with high brand awareness provide strong momentum for the continuous growth of hospital brand equity (Moise et al., 2019). Private hospitals should prioritize enhancing brand awareness in their brand management strategies. Through multi-channel promotion and service quality optimization, hospitals can strengthen patients' brand recognition and loyalty, thereby achieving comprehensive improvements in brand equity.

H3: Brand awareness of private hospitals has a significant positive impact on brand equity.

3.1.4 The relationship between brand loyalty and brand equity in private hospitals

Brand loyalty is a critical component of hospital brand equity, particularly in the competitive environment of private healthcare, where enhancing loyalty plays an essential role in the accumulation of brand equity and the growth of brand value. Kim et al. (2008) argue that brand equity significantly enhances patient loyalty, encompassing both attitudinal loyalty—patients' positive attitudes toward the hospital—and behavioral loyalty, such as repeat visits and recommendations. Strengthening brand equity fosters deeper emotional identification among patients, thereby increasing their loyalty to the hospital (Sinuraya et al., 2021).

First, brand loyalty and hospital reputation have a mutually reinforcing relationship that significantly impacts brand equity. In the healthcare sector, patient loyalty not only directly affects hospital performance but also exerts a profound influence on reputation and brand equity through word-of-mouth effects. Loyalty and brand equity form a dynamic interplay, where they reinforce each other and drive the hospital's sustained development. Górska-Warsewicz (2022) highlights that loyal patients significantly enhance a hospital's reputation. Loyal patients often develop emotional dependence on the hospital based on positive healthcare experiences and are more likely to recommend it to others (Górska-Warsewicz, 2022). This positive word-of-mouth promotion serves as a core driver of reputation enhancement. For instance, when patients consistently select a particular hospital as their primary healthcare provider, they increase the hospital's visibility in the market and establish a benchmark of trust for other potential patients. This reputational boost directly contributes to brand equity, as reputation is one of its core components. A strong reputation further consolidates the hospital's market leadership, attracting more patients and creating a virtuous cycle of brand equity accumulation (Mahmood & Bashir, 2020).

Additionally, increased loyalty can significantly enhance brand awareness and favorability. Loyal patients act as witnesses and promoters of a hospital's service quality and brand value, offering positive evaluations and recommendations that increase the hospital's visibility and recognition in the market. In the private healthcare market, for example, loyal patients often share firsthand experiences regarding the hospital's service quality and professional standards. Such authentic feedback effectively attracts other potential patients (Tosyali et al., 2019). As more patients develop positive perceptions of the hospital, its brand equity continues to grow.

Angela and Adisasmito (2019) emphasize the critical role of brand equity in fostering patient loyalty. Hospitals can stimulate brand loyalty by strengthening their brand image,

enhancing brand awareness, and optimizing service quality. High-end private hospitals, for instance, often focus on cultivating a distinctive brand image characterized by advanced medical technologies, premium patient services, and comfortable healthcare environments. This brand image not only attracts first-time patients but also strengthens trust among existing patients, fostering their loyalty. Increased loyalty means that patients are more likely to choose the hospital for long-term care and may reject competitors' services, enabling the hospital to secure a competitive edge in a highly contested market (Shie et al., 2022).

Wang et al. (2011) further validated the close relationship between brand equity and patient retention rates. They argued that strong brand equity can significantly enhance patient retention, which is critical for the long-term development of hospitals. Improved patient retention not only reduces the costs associated with acquiring new patients but also provides a stable revenue stream for hospitals. For instance, hospitals with strong brand equity often enjoy a positive reputation among patients, which encourages them to continue choosing the hospital as their primary healthcare provider. By maintaining this stable and loyal patient base, hospitals can effectively enhance their market competitiveness while simultaneously increasing the value of their brand equity (Kalhor et al., 2021).

The reciprocal relationship between brand loyalty and brand equity is also evident in hospitals' market expansion capabilities. As loyal patients consistently spread the hospital's positive reputation, the brand's influence expands. This growing brand influence not only increases the hospital's market share in existing markets but also facilitates entry into new market segments. For example, renowned private hospitals have leveraged the positive word-of-mouth of loyal patients to gain widespread recognition in different regions, and even internationally. This expansion effect elevates brand equity across multiple dimensions, including brand awareness, brand image, and brand loyalty (Azzari & Pelissari, 2020).

From the patient's perspective, the formation of loyalty typically depends on the hospital's ability to consistently deliver high-quality service experiences. Patient satisfaction is the foundation of loyalty, and satisfaction itself is both a beneficiary and a driver of brand equity. As hospitals enhance service quality and strengthen their brand image, patient satisfaction improves, which in turn solidifies their loyalty to the hospital. This creates a virtuous cycle of brand equity growth (Aladwan et al. 2021).

Second, loyalty formation is influenced by various factors, with quality and credibility being key. Chahal and Bala (2010) emphasized that patient loyalty is significantly affected by service quality and brand credibility. High-quality medical services and a strong brand reputation enhance patients' trust in the hospital, making them more likely to choose these

hospitals for their healthcare needs. Loyal patients tend to repeatedly seek care from the same hospital and recommend its services to others. Such loyalty behaviors not only improve patient retention rates but also attract more potential patients through word-of-mouth, further reinforcing the hospital's brand equity (Marintan & Ulfah, 2020).

The relationship between loyalty and brand equity is clearly cyclical. Increased loyalty provides sustained support and trust for the hospital's brand, establishing a solid foundation for the growth of brand equity. As an intangible asset, brand equity reflects the hospital's overall competitiveness in the market and directly influences its attractiveness and ability to acquire patients. As brand equity grows, it further strengthens patient loyalty. For instance, hospitals with strong brand equity are often able to gain patient trust more quickly, converting them into loyal patients and injecting new momentum into the accumulation of brand equity. This dynamic relationship provides hospitals with a stable framework for long-term development while enhancing the capacity for sustained brand value growth.

Sinuraya et al. (2021) further emphasized that brand equity has a significant impact on patient loyalty. Strong brand equity not only attracts new patients but also continually enhances the loyalty of existing patients. Hospitals that cultivate robust brand equity—by strengthening brand image, optimizing service experiences, and increasing brand awareness—can significantly boost patients' emotional engagement. This emotional engagement manifests in patients' willingness to choose the hospital as their long-term healthcare provider and their active promotion of the hospital's services to others (Lee, 2019).

The enhancement of brand loyalty also increases the hospital's market appeal. In the context of increasingly competitive healthcare markets, hospitals with high patient loyalty possess a significant competitive advantage. Loyal patients are not only key contributors to hospital revenue but also natural advocates for the hospital's brand influence. Positive patient reviews and recommendations attract additional potential patients, making word-of-mouth marketing a critical component of the hospital's market attractiveness. Moreover, increased brand loyalty helps hospitals navigate market fluctuations and competitive pressures by maintaining a stable patient base and a trust network that preserves market share (Afifi & Amini, 2019).

The interactive relationship between strong brand equity and patient loyalty is crucial for the long-term development of hospitals. On the one hand, improved brand equity effectively fosters the growth of patient loyalty. On the other hand, increased patient loyalty contributes to brand equity through higher patient retention rates and expanded word-of-mouth advocacy. This reciprocal relationship provides critical guidance for hospital brand management: By

optimizing service quality, enhancing brand credibility, and strengthening emotional connections with patients, hospitals can achieve simultaneous improvements in brand loyalty and brand equity, thereby securing a more advantageous position in the competitive healthcare market (Górska-Warsewicz, 2022).

In summary, brand loyalty and hospital brand equity are closely interrelated and mutually reinforcing. Enhanced brand equity strengthens patient loyalty, while increased loyalty further consolidates brand equity, forming a robust brand foundation. This dynamic relationship enables hospitals to achieve a sustainable competitive advantage in highly contested markets, enhancing their brand attractiveness and market share (Uner et al., 2020).

H4: Brand loyalty of private hospitals has a significant positive impact on brand equity.

3.1.5 The moderating role of patient involvement in the relationship between medical service quality and brand equity in private hospitals

Patient involvement refers to the degree of attention and participation patients exhibit in the medical service process, playing a crucial moderating role between private hospital service quality and brand equity. Highly involved patients typically demonstrate a greater willingness to engage in medical processes and higher expectations, significantly influencing the accumulation of hospital brand equity through their focus on service quality and brand image.

Studies indicate that highly involved patients tend to pay close attention to various aspects of medical services provided by hospitals, including diagnostic accuracy, the professionalism of healthcare staff, and the efficiency of service processes (Gong & Liang, 2014; Niu & Li, 2016). These patients, with their high levels of engagement in the medical experience, actively seek relevant information and evaluate hospital services. Improvements in service quality and brand image can significantly enhance brand loyalty among highly involved patients. A positive service experience not only increases their likelihood of repeatedly choosing the hospital but also motivates them to recommend its services through word-of-mouth, thereby driving the growth of hospital brand equity.

The presence of highly involved patients fosters further development of hospital brand equity. These patients' heightened demands for service quality and brand development encourage hospitals to continually optimize their services and management models (Niu & Li, 2016). For example, personalized medical services and communication mechanisms tailored to highly involved patients can improve their satisfaction and trust. At the same time, these patients often act as active promoters of the hospital's brand image. Their positive feedback can help the hospital establish stronger brand recognition among potential patients, thereby

expanding its market influence.

Conversely, low-involvement patients exhibit less concern for service quality and brand image, making these factors relatively less appealing to them. Such patients are more likely to base their choices on price, convenience, or external recommendations. When faced with negative word-of-mouth or service shortcomings, their willingness to choose a hospital decreases significantly. This phenomenon highlights that while low-involvement patients contribute less to brand loyalty, their behavior can still affect the stability of brand equity. Therefore, hospitals must strike a balance between high- and low-involvement patients by developing differentiated service strategies (Fernandes et al., 2019).

The critical role of highly involved patients between service quality and brand equity is further reflected in the depth and breadth of their experiences. These patients often associate their medical service experience closely with the hospital's brand image. Their higher expectations regarding medical technology, service attitude, and facility environment require hospitals to meet their needs with elevated standards. Enhancements such as optimizing patient care processes, providing transparent diagnostic information, and strengthening doctor-patient communication can effectively improve the service experience of highly involved patients, fostering deeper psychological and emotional trust and reliance on the hospital. This reliance ultimately translates into brand loyalty, underpinning sustained growth in brand equity.

To address the needs of highly involved patients, private hospitals can adopt more tailored service strategies in their branding efforts (Kuipers et al., 2019). For instance, establishing feedback mechanisms to gather input from highly involved patients and incorporating their needs into service process improvements can effectively enhance their loyalty. Moreover, highly involved patients are more receptive to the use of digital tools, such as online appointment scheduling, teleconsultations, and electronic health record management. These tools not only enhance service convenience but also provide more personalized medical experiences, thereby further strengthening the hospital's brand image and competitive edge (Nguyen et al., 2021).

Although low-involvement patients contribute less directly to brand equity, hospitals must still optimize basic services to earn their trust. Enhancing the convenience of infrastructure and improving the quality of basic services can attract low-involvement patients to some extent and mitigate the negative impact of poor word-of-mouth on brand equity.

In conclusion, patient involvement serves as a vital moderator between service quality and brand equity in private hospitals. Highly involved patients, through their intense focus on

and participation in service quality and brand-building efforts, provide core momentum for brand equity growth. Hospitals should deliver high-quality, personalized services to this group while optimizing basic services to maintain their appeal to low-involvement patients. Through this dual strategy, hospitals can effectively enhance their overall brand equity, achieving sustainable development in the highly competitive healthcare market (Górska-Warsewicz, 2022).

H5: Patient involvement amplifies the relationship between medical service quality of private hospitals and brand equity.

3.1.6 The moderating role of patient involvement in the relationship between brand image and brand equity in private hospitals

In recent years, patient involvement has been widely recognized as a critical moderating variable between brand image and brand equity in private hospitals. Patient involvement refers to the degree of attention and participation that patients exhibit toward hospital services and brands during their medical experiences, significantly influencing the transformative effect of brand image on brand equity. Specifically, highly involved patients strengthen the positive impact of brand image on brand equity through more active interaction and participation, particularly in enhancing brand loyalty (Phan et al., 2021).

The mechanism of patient involvement can be understood through its role in brand communication and identification. Tosyali et al. (2019) highlighted that patients who share their personal treatment experiences on social media and other platforms not only enhance the hospital's brand image but also increase the trust of potential patients in the hospital's service quality. For instance, positive evaluations and recommendations from highly involved patients on social platforms can rapidly expand brand awareness and deepen public brand identification, thereby fostering strong brand loyalty. This process drives the growth of hospital brand equity, as brand loyalty is a critical component of brand equity and a core indicator of brand value stability.

Sukawati (2021) found that patient involvement significantly amplifies the word-of-mouth effect of brand image. When hospitals provide high-quality medical services and cultivate a positive brand image, highly involved patients are more likely to choose and recommend the hospital. This recommendation behavior, rooted in personal experience, is essential for enhancing brand equity. At the same time, Wu (2011) argued that brand image contributes directly to brand equity by improving patient satisfaction and trust. In this process, highly involved patients act as moderators, with their higher expectations and demands

driving hospitals to continuously optimize service quality and innovate, further reinforcing the positive effects of brand image.

Palamutçuoğlu et al. (2016), through meta-analysis, demonstrated that patient involvement plays a vital moderating role between brand image and brand loyalty. Highly involved patients tend to exhibit greater trust and dependence on hospital brands. This trust not only strengthens the relationship between patients and hospitals but also enhances patients' perceptions of brand loyalty. The improvement in brand loyalty is not only critical for patient retention but also attracts potential patients through positive word-of-mouth, facilitating the sustained growth of brand equity.

Lee et al. (2015) further supported this perspective, showing that higher patient involvement amplifies the impact of brand image on patient trust and loyalty. When patients pay more attention to and actively engage with hospital services and brand interactions, they are more likely to perceive the core values and distinctive features of the hospital's brand image. This perception translates into stronger trust and loyalty toward the hospital. The higher the level of patient involvement, the stronger the positive effect of brand image on brand loyalty and brand equity.

In summary, patient involvement plays a crucial moderating role between brand image and brand equity by influencing patients' identification with the brand image and fostering brand loyalty. Highly involved patients, through their increased participation and higher demands, drive hospitals to continuously improve service quality and innovate brand strategies. This not only enhances the effectiveness of brand image but also promotes the growth of brand equity.

Thus, patient involvement not only deepens patients' identification with the hospital's brand image but also enhances the overall competitiveness of the hospital's brand equity by increasing trust and satisfaction. This suggests that private hospitals should prioritize improving patient involvement as part of their brand-building efforts. Doing so not only strengthens the positive influence of brand image on brand equity but also enhances the market appeal and competitiveness of the brand.

H6: Patient involvement amplifies the relationship between the brand image of private hospitals and brand equity.

3.1.7 The moderating role of patient involvement in the relationship between brand awareness and brand equity in private hospitals

Patient involvement, as a critical variable influencing brand management, plays a significant

moderating role between brand awareness and brand equity in private hospitals. Brand awareness is a vital component of brand equity and a key factor influencing patients' choice of hospitals. Through active patient engagement and interaction, brand awareness is enhanced, which directly strengthens the hospital's brand equity.

Górska-Warsewicz (2022) highlighted that patient participation significantly boosts brand awareness, thereby enhancing the market value of the brand. Patients' cognition and involvement directly drive the growth of brand awareness. For instance, patient evaluations and recommendations of hospital services substantially increase the hospital's visibility within patient groups. This word-of-mouth effect plays a crucial role in expanding brand recognition. The improvement in brand awareness not only attracts more patients but also reinforces the loyalty of existing patients, thus contributing to the accumulation and growth of brand equity.

Palamutçuoğlu et al. (2023) emphasized the strong connection between patient brand preference and brand choice, particularly under conditions of high patient involvement. Highly involved patients are typically more attentive to the brand's image and reputation, and their choices and preferences enhance the brand's market influence. For example, highly involved patients are more likely to choose hospitals with well-known brands and recommend them to friends and family. Such behavior not only elevates brand awareness but also fosters increased patient loyalty and trust, thereby promoting the growth of brand equity.

Tosyali et al. (2019) further pointed out that social media interaction is a crucial pathway for enhancing brand awareness, where patient involvement plays a pivotal role. Highly involved patients often share their healthcare experiences on social media platforms, increasing the brand's visibility and establishing trust and goodwill among potential patients. For instance, positive social media interactions allow more individuals to encounter the hospital's brand information, thereby raising its awareness among potential patients and expanding its market influence. This social media-driven dissemination injects new momentum into the accumulation of brand equity.

Pauly and Selvakumar (2018) highlighted the strong relationship between brand awareness and brand preference, noting that increased awareness significantly enhances patients' likelihood of selecting a particular brand. Patient involvement further amplifies this effect by improving brand recognition and fostering greater loyalty and trust. For instance, when hospitals promote their brand through advertising, publicity, or patient recommendations, highly involved patients are more likely to develop trust and reliance on the hospital. This trust ultimately translates into loyal behaviors such as repeat visits and

active recommendations, driving the growth of brand equity.

Wu (2011) emphasized the close connection between patients' brand perception and brand awareness. An increase in brand awareness not only boosts patients' loyalty to the hospital but also significantly contributes to the sustained growth of brand equity. Patient involvement plays a critical moderating role in this process by directly enhancing loyalty and trust through improved brand awareness. For example, highly involved patients are more likely to participate in brand-related activities and actively disseminate brand information, further solidifying the hospital's market position and brand equity.

In conclusion, patient involvement plays a crucial moderating role between brand awareness and brand equity. Highly involved patients not only enhance brand awareness through their cognition and participation but also drive the growth of brand equity by fostering loyalty and trust. In the competitive private healthcare market, highly involved patients are often key drivers of brand promotion and value creation. Their word-of-mouth recommendations and brand advocacy help hospitals secure more advantageous market positions. Moreover, the differentiation in patient involvement provides hospitals with a tiered approach to brand management. By optimizing services and communication for highly involved patients, hospitals can achieve accelerated growth in brand equity.

Therefore, private hospitals should prioritize enhancing patient involvement in their brand management strategies. By increasing brand interactivity and service transparency, hospitals can further strengthen the positive impact of brand awareness on brand equity. This approach not only helps hospitals establish a robust competitive advantage in the market but also provides sustainable momentum for the long-term development of their brand.

H7: Patient involvement amplifies the relationship between the brand awareness of private hospitals and brand equity.

3.1.8 The moderating role of patient involvement in the relationship between brand loyalty and brand equity in private hospitals

Patient involvement is a crucial factor influencing brand management in private hospitals, serving as a significant moderator between brand loyalty and brand equity. Brand loyalty is one of the core components of brand equity, and patient involvement, by deepening and broadening loyalty, further drives the accumulation and growth of brand equity.

Wu (2011) demonstrated that brand image directly affects patient loyalty, and the enhancement of patient loyalty significantly promotes brand equity growth. In this process, patient involvement plays a pivotal role. Highly involved patients tend to exhibit stronger

brand dependence and emotional connections. They not only demonstrate a higher level of recognition for the brand's services and values but also maintain the hospital's market advantage through active participation and interaction. For example, satisfied, highly involved patients often proactively recommend or share positive feedback about the hospital, reinforcing brand loyalty and driving brand equity growth through word-of-mouth effects.

Angela and Adisasmito (2019) further emphasized that highly involved patients strengthen their emotional connection with the hospital brand, significantly enhancing brand loyalty and contributing to brand equity growth. Highly involved patients are more likely to develop a dependency on the hospital brand, reflected not only in their continuous utilization of hospital services but also in their active role in maintaining the brand's image. By enhancing loyalty, these patients become key drivers of brand equity. In competitive healthcare markets, highly involved patients support the hospital's market position through repeat visits and active recommendations, attracting more potential patients.

Sinuraya et al. (2021) also highlighted the centrality of brand loyalty in brand equity. Highly involved patients increase loyalty in various ways, directly contributing to the accumulation of brand equity. These patients exhibit stronger brand dependence and are more willing to engage in brand-related activities, such as online reviews, surveys, and social media promotion. Through these behaviors, highly involved patients enhance market awareness and trust in the hospital brand, providing continuous support for brand equity growth.

Patient involvement also fosters a bidirectional relationship between emotional connection and brand interaction, positively influencing both brand loyalty and brand equity. Highly involved patients often develop stronger emotional ties to the hospital brand, actively providing feedback on their experiences and offering constructive suggestions for brand improvement. This emotional connection strengthens the relationship between patients and the brand, solidifying loyalty. Additionally, the active participation of highly involved patients enhances the quality of brand interactions. For example, their engagement on social media and positive reviews amplifies the brand's market influence, attracting more loyal patients and ultimately contributing to steady brand equity growth.

Furthermore, the behavior of highly involved patients has a notable demonstrative effect. Their participation and recommendations extend the positive impact of brand loyalty to other potential patients. For instance, when highly involved patients promote the hospital brand through social media or word-of-mouth, they inspire trust and goodwill among other patients, expanding the loyal patient base. This ripple effect not only strengthens the role of brand loyalty but also further consolidates the accumulation of brand equity.

In conclusion, patient involvement serves as a critical moderating factor between brand loyalty and brand equity in private hospitals. Highly involved patients enhance emotional connections, deepen brand dependence, and facilitate brand interaction, significantly boosting brand loyalty. In turn, enhanced loyalty drives brand equity growth through repeat utilization, word-of-mouth promotion, and brand recommendations. Therefore, private hospitals should prioritize increasing patient involvement in their brand management strategies by optimizing service experiences, enhancing interaction, and fostering long-term emotional connections. By leveraging patient involvement as a moderating factor, hospitals can achieve mutual reinforcement of brand loyalty and brand equity. This approach not only helps hospitals consolidate their existing market positions but also attracts more loyal patients, enhancing competitiveness in the healthcare industry and laying a solid foundation for long-term brand development.

H8: Patient involvement amplifies the relationship between the brand loyalty of private hospitals and brand equity.

Based on the above analysis, summarize the research hypotheses as shown in Table 3.1:

Table 3.1 Summary of research hypotheses

Hypotheses	Content
H1:	Medical service quality of private hospitals has a significant positive impact on brand equity.
H2:	Brand image of private hospitals has a significant positive impact on brand equity.
H3:	Brand awareness of private hospitals has a significant positive impact on brand equity.
H4:	Brand loyalty of private hospitals has a significant positive impact on brand equity.
H5:	Patient involvement amplifies the relationship between medical service quality of private hospitals and brand equity.
H6:	Patient involvement amplifies the relationship between the brand image of private hospitals and brand equity.
H7:	Patient involvement amplifies the relationship between the brand awareness of private hospitals and brand equity.
H8:	Patient involvement amplifies the relationship between the brand loyalty of private hospitals and brand equity.

3.2 Conceptual model

Medical service quality, as a direct manifestation of perceived quality, has a significant positive impact on brand equity. High-quality services enhance patient satisfaction, which in turn boosts brand loyalty and brand associations such as safety and professionalism, key elements in building a strong brand.

The strength of the brand itself, such as brand image and brand awareness, directly elevates consumer brand perception, forming a differentiated competitive advantage for the

brand. Hospitals with a positive brand image are more likely to gain consumer trust, influencing patients to opt for hospitals with favorable brand images when choosing medical services.

Patient involvement serves as a moderating variable in this model, playing a pivotal role. Higher patient involvement indicates that patients are more attentive and invested in their treatment process, which heightens the sensitivity of brand equity to service quality. When patients are deeply involved, they are more sensitive to every detail of the service, thus, high-quality service has a more pronounced positive impact in their perception, thereby enhancing brand equity more effectively.

Health human capital plays a central role in the relationship between medical service quality, brand image, brand awareness and loyalty, brand equity, and patient involvement. High-quality medical services rely on the professional skills, experience, and service awareness of healthcare personnel, which directly influence a hospital's brand image and patient trust, thereby enhancing brand awareness and loyalty. Medical institutions with high health human capital are better equipped to provide personalized and precise medical services, improving the patient experience and further strengthening brand equity. Additionally, a highly skilled healthcare team can effectively communicate with patients, enhance their health literacy and decision-making capabilities, and thereby increase patient involvement, encouraging more active participation and interaction in the medical process. Therefore, health human capital not only serves as the foundation for medical service quality but also acts as a driving force in brand development and patient behavior influence mechanisms.

In summary, medical service quality directly influences brand equity through enhanced perceived quality, while the overall brand image strengthens this effect through brand awareness and brand associations. The level of patient involvement moderates the impact of both on brand equity, with highly involved patients showing a more pronounced response to service quality, significantly boosting brand equity. This theoretical model provides private hospitals with strategic directions to optimize brand equity by enhancing service quality and strengthening brand building.

Based on the research hypotheses and the analysis above, the research model for this study is constructed as shown in Figure 3.1.
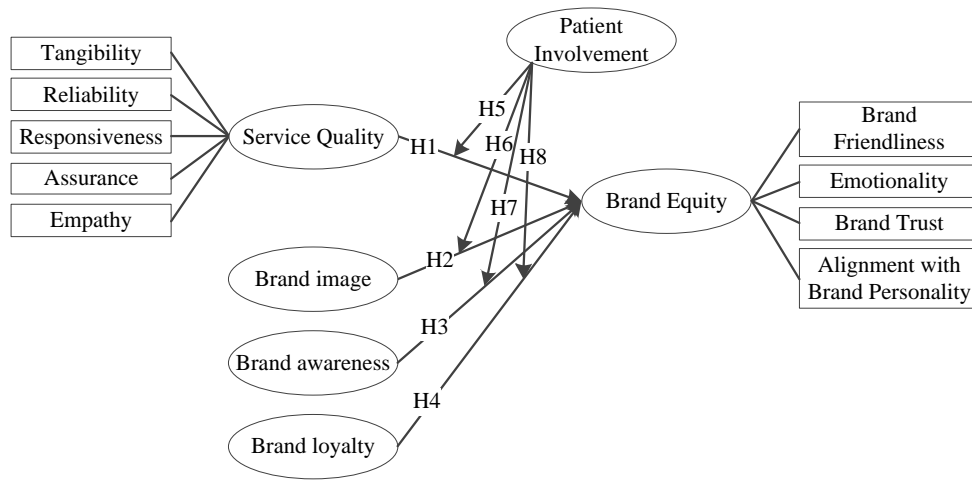
Figure 3.1 Research model

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Chapter 4: Research Design

4.1 Questionnaire design

A well-designed survey questionnaire requires the active engagement of respondents, as their complete and accurate answers are crucial to the success of the research. In designing the questionnaire for this study, careful consideration has been given to the research objectives, relevant literature, and the research framework. Generally, a survey questionnaire consists of three sections: the introduction, the main questionnaire, and background information. The introduction briefly outlines the purpose and content of the survey and includes expressions of gratitude to ensure respondents feel the researcher's sincerity, which is essential for cooperation and support.

The questionnaire is divided into primary and secondary sections. In the main part, scales are structured to measure six variables. Considering that the Likert scale offers higher reliability than other scales of similar length and that a five-point scale allows respondents to easily express varying levels of agreement, this study employs a five-point Likert scale, where each statement is followed by options from 1 to 5, increasing in level of agreement. To mitigate respondents' concerns about the balance of positive and negative items, all initial scale items are presented as positive statements. This approach encourages respondents to avoid cognitive laziness, reduces the likelihood of boredom, and promotes careful thinking, which helps maintain a logical flow and enhances the quality of responses.

This study utilizes a self-assessment format, with all items completed by respondents themselves. The questionnaire content is divided into three main sections: the introduction, basic demographic information, and the main survey. The introduction explains the purpose of the survey; the demographic section includes seven items regarding respondents' gender, age, education level, marital status, monthly income, and healthcare payment methods. The main survey section measures Service Quality, Brand Awareness, Brand Image, Brand Loyalty, Patient Involvement, and Brand Equity.

4.2 Determination of measurement scales

(1) Service quality scale

This study references the SERVQUAL model proposed by Parasuraman (1991) to evaluate the quality of healthcare services in private hospitals. The evaluation is based on five dimensions: tangibility, reliability, responsiveness, assurance, and empathy, encompassing a total of 22 items.

Table 4.1 Service quality scale

Dimension	Measurement Question
Tangibility	1. Private hospitals are equipped with modern medical facilities. 2. The exterior environment of private hospitals is appealing. 3. The attire and appearance of the staff in private hospitals are neat and tidy. 4. Private hospitals clearly mark their facilities and service processes.
Reliability	1. Private hospitals fulfill their commitments to patients punctually. 2. Staffs at private hospitals are enthusiastic about resolving patients' issues. 3. Private hospitals provide meticulous and correct services at a patient's first visit. 4. Private hospitals deliver services on time as expected. 5. Private hospitals accurately record patients' medical information.
Responsiveness	1. Staffs at private hospitals proactively inform patients about service and treatment processes and timelines. 2. Private hospital staff offer immediate and appropriate service. 3. Private hospital staff are willing to assist patients. 4. Private hospital staff do not neglect to answer patients' questions due to being too busy.
Assurance	1. The conduct of private hospital staff influences patients' confidence in the services. 2. Patients feel safe during their visits. 3. Staffs at private hospitals are courteous and friendly. 4. Private hospital staff possess sufficient knowledge to answer patients' inquiries.
Empathy	1. Private hospital staff give individual attention to different patients. 2. The outpatient hours at private hospitals meet the needs of patients. 3. Private hospitals have staff who care about individual patients. 4. Private hospitals prioritize the interests of their patients. 5. Staffs at private hospitals have a clear understanding of patients' special needs.

Source: Agarwal and Singh (2016)

(2) Brand scale

The brand image dimension draws upon the research findings of Xin (2021) and includes two items. The brand awareness dimension is based on the study by Sun (2018) and consists of four items. The brand loyalty dimension is developed from Zhang (2009)'s research and includes three items. Adjustments were made to these items to better align with the characteristics of private hospitals.

Table 4.2 Brand scale

Dimension	Measurement Question

Brand Awareness	1. Private hospitals are very famous 2. I am familiar with private hospitals 3. The characteristics of private hospitals are very obvious 4. I am familiar with the signs or symbols of private hospitals
Brand Image	1. Private hospitals excel in treatment technology 2. Doctors in private hospitals are well-known 3. I believe this hospital has an excellent reputation in the healthcare industry.
Brand loyalty	1. I consider myself loyal to this private hospital. 2. This private hospital would be my first choice. 3. Given the option to seek treatment at this private hospital, I would not consider other brands

Source: Al-Hasan (2024); Han et al. (2014); Heskiano et al., (2020)

(3) Patient involvement scale

The Patient Involvement Inventory (PII) was first introduced by Zaichkowsky (1985) to measure the degree of individual engagement in specific contexts. The original PII consisted of 20 semantic differential items assessing individuals' interest and emotional involvement in a given matter. Later, Zaichkowsky (1994) reduced the scale to 10 items, scored using a five-point Likert scale. The PII has demonstrated high reliability and validity, effectively capturing patients' sense of engagement and attention in healthcare services. Patients scoring above 35 on the PII are classified as highly involved, whereas those scoring below 25 are considered to have low involvement.

Table 4.3 Patient involvement scale

This thing for me is						
Unimportant	1	2	3	4	5	Important
Uninteresting	1	2	3	4	5	Interesting
Irrelevant	1	2	3	4	5	Relevant
Unexciting	1	2	3	4	5	Exciting
Meaningless	1	2	3	4	5	Meaningful
Unattractive	1	2	3	4	5	Attractive
Unattractive	1	2	3	4	5	Engaging
Worthless	1	2	3	4	5	Valuable
Uninvolved	1	2	3	4	5	Engaging
Unnecessary	1	2	3	4	5	Needed

Source: Laczniak et al. (1989)

(4) Brand equity scale

The brand equity scale is developed based on the measurement items proposed by Srivastava (2012) and adapted to the specific characteristics of private healthcare services and the objectives of this study. The final scale consists of four dimensions and 15 items.

Table 4.4 Brand equity scale

Dimension	Measurement Question
Brand Friendliness	1. I consider this brand as my friend 2. I like to associate with this brand 3. I feel that I will suffer a loss by leaving this brand

Emotionality	4. Association with this brand enhances my confidence 1. I like this brand very much 2. I can feel this brand whenever I use it 3. Whenever I go to the hospital, I think of my favorite brand 4. I like to see the brand advertisement of this hospital
Brand Trust	1. The quality of the brand is consistent 2. The credibility of the brand is very high 3. For different hospitals, I prefer to use this hospital brand
Alignment With Brand Personality	1. I am able to express myself with this brand 2. The characteristics of the brand match my personality traits 3. Using the brand gives me the identity I want 4. This brand represents my social class

Source: Parrish and Nevins (2023)

4.3 Research object

The subjects of this study are patients of medical services at private hospitals, particularly patients who place a high value on medical service quality and brand perception of the hospital. Specifically, these patients may include individuals who have received or are currently receiving medical services, as well as their family members or caregivers. This group demonstrates heightened sensitivity to service quality, hospital brand, and the additional value these attributes bring when selecting private hospital services. Various levels of "Patient involvement" are likely to influence their perceptions and evaluations of brand equity.

A survey questionnaire targeting private hospital patients was designed and distributed to assess their perceptions of medical service quality, hospital branding, brand equity, and their level of engagement with hospital services. The questionnaire was administered both online and offline—distributed in hospital settings, on patient social media platforms, or health applications—to ensure the collection of a representative sample.

4.4 Questionnaire pre-survey

To ensure the accuracy and validity of the study's results, a pilot test on a small sample was conducted before distributing the questionnaire on a larger scale. During the pre-survey stage, a single private hospital was selected as the research subject for the following reasons. First, before the formal implementation of the research instrument, a small-scale pilot study was conducted to assess the comprehensibility of the questionnaire, the applicability of the measurement items, and the feasibility of the overall survey process. By conducting a preliminary investigation in one hospital, the study was able to evaluate the reliability and validity of the questionnaire, identify potential comprehension biases, measurement blind

spots, or redundant items, and subsequently refine and optimize the questionnaire. Second, conducting a pre-survey in a single hospital helped reduce research costs and time investment, thereby improving the feasibility of the study. Additionally, this approach ensured that the questionnaire used in the formal survey phase was of higher quality, leading to more targeted and accurate data collection.

This pilot test allowed for an assessment of the questionnaire's validity and reliability based on reliability analysis and exploratory factor analysis of the small sample data. In September 2024, an initial pretest survey was conducted online, distributing 120 questionnaires to private hospital patients. A total of 92 valid responses were collected, resulting in a response rate of 76.7%. The collected data was then analyzed using SPSS 21.0 statistical software.

(1) Reliability test

This study used Cronbach's α coefficient to analyze reliability, which in measurement theory examines whether questionnaire results exhibit internal consistency and reliability. Generally, a Cronbach's α coefficient above 0.6 is considered acceptable. As shown in Table 4.5, the reliability coefficients for each factor variable exceed 0.6, indicating that the scale demonstrates acceptable reliability.

Table 4.5 Reliability analysis of pre-survey

	Scale	Cronbach's Alpha	Number of questions
Service Quality	Tangibility	.753	4
	Reliability	.747	5
	Responsiveness	.815	4
	Assurance	.822	4
	Empathy	.718	5
Brand image	-	.803	4
Brand awareness	-	.893	3
Brand loyalty	-	.858	3
Patient involvement	-	.785	10
Brand equity	Brand Friendliness	.741	4
	Emotionality	.718	4
	Brand trust	.743	3
	Alignment with brand personality	.736	4

Based on the results shown in Table 4.5, the data for the scales measuring Service Quality, Brand Image, Brand Awareness, Brand Loyalty, Patient Involvement, and Brand Equity are relatively reliable. Each factor's Cronbach's α reliability coefficient were all above 0.7, indicating a relatively high level of reliability across the scales according to the previously discussed criteria for reliability.

(2) Validity test

The validity test of the questionnaire refers to an assessment of its effectiveness. This analysis primarily examines two aspects: construct validity and content validity. Construct

validity, originally developed in the context of psychological therapy in the U.S., involves examining the primary test data, observing the effective data in relation to specific theoretical foundations, and identifying relevant factors that may influence the survey results. Content validity, on the other hand, is evaluated based on the consistency between the survey content and the characteristics of the subjects.

For this study, classic questionnaire examples were gathered and analyzed to design a questionnaire best suited to the research objectives, ensuring reliable validity and content validity.

To begin, the Kaiser-Meyer-Olkin (KMO) and Bartlett's tests were conducted to examine the relationships among variables. Generally, higher KMO values indicate stronger correlations among variables, with a KMO value above 0.8 suggesting that factor analysis is appropriate due to strong inter-variable relationships. A KMO below 0.5 indicates insufficient correlation among variables for factor analysis. When KMO values fall between 0.5 and 0.8, the validity test's accuracy decreases as the KMO value declines. The KMO and Bartlett's test results for this study are shown in Table 4.6.

Table 4.6 KMO and Bartlett's sphericity test of pre-survey

Kaiser-Meyer-Olkin		.794
Bartlett's sphericity test	Chi-square	372.174
	Df	35
	Sig.	.000

Based on the results shown in Table 4.6, the KMO value for this survey is 0.794, meeting the basic requirements for factor analysis. Additionally, the significance level of Bartlett's test of sphericity is 0.000, indicating a significant result. This suggests a high level of reliability in the questionnaire, allowing for formal research to proceed.

4.5 Distribution and collection of formal questionnaires

During the formal survey phase, this study expanded the scope to six private hospitals to ensure the representativeness of the data. The selection of these six hospitals was based on the following principles: First, regional representativeness—hospitals from different regions were selected to account for variations in economic development levels, healthcare policy environments, and patient consumption capacities, thereby enhancing the generalizability of the research findings. Second, diversity in hospital scale—given that brand equity may be influenced by hospital size, the study included hospitals of varying scales, such as large comprehensive private hospitals, medium-sized specialized hospitals, and small private clinics,

to ensure comprehensive data coverage. Third, differences in brand influence—both hospitals with high brand recognition and strong brand equity, as well as those with relatively weaker brand development, were included. This approach allowed for an examination of how hospitals at different stages of brand development construct their brand equity. By adopting this selection strategy, the study ensures the scientific rigor and validity of the collected questionnaire data.

The formal survey was conducted using an electronic questionnaire distributed via the Wenjuanxing platform to healthcare consumers in private hospitals. A convenience sampling method was employed to obtain the most authentic survey data. The questionnaire was administered in October 2024, spanning approximately nine days. To ensure effective reach to the target population, the study was conducted on-site at hospitals, where researchers guided patients to scan a QR code with their mobile phones to complete the survey. Patients could fill out the questionnaire independently while waiting for their appointments or after receiving medical services. This approach not only improved the response rate but also ensured that respondents' real-time medical experiences were accurately reflected in the survey results. A total of 710 questionnaires were collected, providing sufficient data for subsequent statistical analysis and ensuring the reliability and broad applicability of the research findings. The statistical results of the demographic variables of the formal sample are shown in Table 4.7.

Table 4.7 Summary of the statistical results of the demographic variables of the formal survey sample

Type	Classification	Number	Percentage%
Gender	Male	355	50.0
	Female	355	50.0
Age	18-25 years	76	10.7
	26-35 years	194	27.3
	36-45 years	302	42.5
	Over 46 years	138	19.4
Educational Background	College degree or below	220	31.0
	Bachelor's degree	400	56.3
	Master's degree or higher	90	12.7
Marital Status	Single	144	20.3
	Married	422	59.4
	Divorced	128	18.0
	Widowed	16	2.3
Monthly Income	Less than 3,000 CNY	127	17.9
	3,001-5,000 CNY	193	27.2
	5,001-10,000 CNY	225	31.7
	More than 10,001 CNY	165	23.2
Medical Expenses Payment Method:	Social medical insurance	392	55.2
	Commercial insurance	227	32.0
	Out-of-pocket	79	11.1
	Other	12	1.7

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Chapter 5: Empirical Analysis

5.1 Descriptive statistical analysis

The sample data of each variable was input into SPSS for descriptive statistical analysis, and the results are shown in Table 5.1.

Table 5.1 Descriptive statistical analysis results of each variable(n=710)

Dimensions	Min	Max	M	SD	Skewness	Kurtosis
Service Quality	1	5	3.823	0.745	-0.687	0.745
Brand image	1	5	3.297	0.841	-1.164	0.654
Brand awareness	1	5	3.975	0.687	-0.758	0.647
Brand loyalty	1	5	3.871	0.752	-0.874	0.776
Patient involvement	1	5	3.254	0.649	0.811	-0.785
Brand equity	1	5	3.169	0.748	0.785	-0.741

The mean score for Service Quality is 3.823, indicating a generally positive evaluation from patients regarding the Service Quality of private hospitals, close to a score of 4 on a 5-point scale. The skewness of -0.687 suggests a negatively skewed distribution, with most patient ratings concentrated in the higher score range. The kurtosis of 0.745 indicates a slightly more concentrated distribution compared to a normal distribution.

The mean score for Brand Image is 3.297, suggesting that patients' perception of Brand Image is moderately above average. A skewness of -1.164 indicates a stronger negative skew, with scores leaning towards higher values. The kurtosis of 0.654 reflects a distribution more concentrated than a normal distribution.

For Brand Awareness, the mean is 3.975, showing a relatively high level of Brand Awareness among patients. The skewness of -0.758 demonstrates a negative skew, with most ratings at the higher end. A kurtosis of 0.647 indicates a slightly concentrated distribution.

The mean score for Brand Loyalty is 3.871, indicating a high level of loyalty to the hospital brand. The skewness of -0.874 suggests that ratings for Brand Loyalty are concentrated in the higher range, with a negatively skewed distribution. The kurtosis of 0.776 shows a distribution slightly more concentrated than normal.

Patient Involvement has a mean of 3.254, indicating a moderate level of brand involvement among patients. A skewness of 0.811 shows a positive skew, with some patients having lower involvement. The kurtosis of -0.785 suggests a relatively flat distribution, indicating greater variability in Patient Involvement ratings.

The mean score for Brand Equity is 3.169, suggesting a moderate level of Brand Equity in patient perception. A skewness of 0.785 shows a positive skew, indicating that some patients rate Brand Equity lower. The kurtosis of -0.741 reflects a relatively flat distribution, demonstrating considerable variability in patients' evaluations of Brand Equity.

5.2 Reliability analysis

The reliability is analyzed by using Cronbach α consistency coefficient. Generally, a Cronbach α coefficient above 0.7 is acceptable. As can be seen from Table 5.2, the reliability coefficients of each factor variable are all greater than 0.7, indicating that the reliability of the scale is acceptable.

Table 5.2 Reliability analysis of the formal questionnaire

	Scale	Cronbach's Alpha	Number of questions
	Tangibility	.793	4
	Reliability	.757	5
Service Quality	Responsiveness	.762	4
	Assurance	.833	4
	Empathy	.876	5
Brand image	-	.824	4
Brand awareness	-	.895	3
Brand loyalty	-	.963	3
Patient involvement	-	.812	10
	Brand Friendliness	.869	4
Brand equity	Emotionality	.915	4
	Brand trust	.943	3
	Alignment with brand personality	.957	4

Based on the results shown in Table 5.2, the scales for Service Quality, Brand Image, Brand Awareness, Brand Loyalty, Patient Involvement, and Brand Equity exhibit relatively high reliability. Each factor's Cronbach's α reliability coefficient were all above 0.7. According to the criteria outlined previously, the reliability of these questionnaire scales is relatively high.

5.3 Validity analysis

5.3.1 Exploratory factor analysis

(1) Service quality scale

The KMO test value for the Service Quality questionnaire in this study is 0.794, indicating that most of the values in the correlation matrix are relatively small, making it suitable for factor analysis. Additionally, Bartlett's test of sphericity shows an x^2 statistic with

a significance probability of 0.000, which is less than 1%, suggesting that the data has sufficient correlation and is appropriate for factor analysis, as shown in Annex B Table b.1.

(2) Brand image scale

The KMO test value for the Brand image questionnaire in this study is 0.813, indicating that most of the values in the correlation matrix are relatively small, making it suitable for factor analysis. Additionally, Bartlett's test of sphericity shows an x^2 statistic with a significance probability of 0.000, which is less than 1%, suggesting that the data has sufficient correlation and is appropriate for factor analysis, as shown in Annex B Table b.2.

(3) Brand awareness scale

The KMO test value for the Brand awareness questionnaire in this study is 0.754, indicating that most of the values in the correlation matrix are relatively small, making it suitable for factor analysis. Additionally, Bartlett's test of sphericity shows an x^2 statistic with a significance probability of 0.000, which is less than 1%, suggesting that the data has sufficient correlation and is appropriate for factor analysis, as shown in Annex B Table b.3.

(4) Brand loyalty scale

The KMO test value for the Brand loyalty questionnaire in this study is 0.828, indicating that most of the values in the correlation matrix are relatively small, making it suitable for factor analysis. Additionally, Bartlett's test of sphericity shows an x^2 statistic with a significance probability of 0.000, which is less than 1%, suggesting that the data has sufficient correlation and is appropriate for factor analysis, as shown in Annex B Table b.4.

(5) Patient involvement scale

The KMO test value for the Patient involvement questionnaire in this study is 0.763, indicating that most of the values in the correlation matrix are relatively small, making it suitable for factor analysis. Additionally, Bartlett's test of sphericity shows an x^2 statistic with a significance probability of 0.000, which is less than 1%, suggesting that the data has sufficient correlation and is appropriate for factor analysis, as shown in Annex B Table b.5.

(6) Brand equity scale

The KMO test value for the Brand equity questionnaire in this study is 0.824, indicating that most of the values in the correlation matrix are relatively small, making it suitable for factor analysis. Additionally, Bartlett's test of sphericity shows an x^2 statistic with a significance probability of 0.000, which is less than 1%, suggesting that the data has sufficient correlation and is appropriate for factor analysis, as shown in Annex B Table b.6.

The above KMO and Bartlett's test of sphericity results indicate that the scales for Service Quality, Brand Image, Brand Awareness, Brand Loyalty, Patient Involvement, and

Brand Equity are suitable for further factor analysis.

Factor Analysis (FA) is a technique used to reduce the complexity of multiple variables, simplifying research by retaining as much original information as possible. This process allows for the replacement of the original variables with a few composite indicators. In this section, principal component analysis (PCA) is used as an exploratory factor analysis method, with factors extracted through orthogonal rotation.

(1) Factor analysis of service quality

The total variance explained by the principal component analysis for Service Quality is presented in Annex B Table b.7.

The SPSS output indicates five principal components with eigenvalues greater than 1, with a cumulative contribution rate of 78.41%, reflecting the information comprehensively. Therefore, five principal components were extracted, each with factor loadings above 0.6, and the assigned factors align with the five dimensions of Service Quality. The factor loadings for these five components are shown in Annex B Table b.8.

(2) Factor analysis of brand image

The total variance explained by principal component analysis is shown in Annex B Table b.9.

The SPSS output further indicates a single principal component with an eigenvalue greater than 1, and a cumulative contribution rate of 79.05%, adequately capturing the information. Thus, one principal component was extracted, with all factor loadings exceeding 0.6, aligning with the corresponding survey items. The factor loadings for this component are presented in Annex B Table b.10.

(3) Factor analysis of brand awareness

The total variance explained by principal component analysis is shown in Annex B Table b.11.

Additionally, SPSS output shows one principal component with an eigenvalue greater than 1 and a cumulative contribution rate of 78.23%, sufficiently reflecting the information. Therefore, one principal component was extracted, with all factor loadings above 0.6, consistent with the related items. The factor loadings for this component are shown in Annex B Table b.12.

(4) Factor analysis of brand loyalty

The total variance explained by principal component analysis is shown in Annex B Table b.13.

The SPSS output also indicates one principal component with an eigenvalue greater than

1 and a cumulative contribution rate of 72.07%, comprehensively representing the information. Accordingly, one principal component was extracted, with all factor loadings exceeding 0.6 and aligned with the corresponding survey items. The factor loadings for this component are shown in Annex B Table b.14.

(5) Factor analysis of patient involvement

The total variance explained by principal component analysis is shown in Annex B Table b.15.

Moreover, SPSS output shows one principal component with an eigenvalue greater than 1 and a cumulative contribution rate of 71.69%, capturing the information effectively. Therefore, one principal component was extracted, with all factor loadings above 0.6. The factor loadings are displayed in Annex B Table b.16.

(6) Factor analysis of brand equity

The total variance explained by principal component analysis is shown in Annex B Table b.17.

The SPSS output indicates four principal components with eigenvalues greater than 1 and a cumulative contribution rate of 72.49%, adequately reflecting the information. Thus, four principal components were extracted, with all factor loadings above 0.6, aligning with the respective survey items. The factor loadings for these four components are presented in Annex B Table b.18.

5.3.2 Confirmatory factor analysis

This section will use AMOS 22.0 software to conduct confirmatory factor analysis on the collected data to test the overall fit of the model, as shown in Table 5.3.

Table 5.3 Fit index of the overall model

Fitting index	CMIN/DF	RMSEA	RMR	AGFI	GFI	TLI	NFI	CFI
Fitting standard	<3	<0.08	<0.05	>0.90	>0.90	>0.90	>0.90	>0.90
Result	2.318	0.057	0.044	0.956	0.902	0.917	0.942	0.911

According to the fitting index in Table 5.3, the fitting effect is good. Therefore, it can be considered that the overall fit of the model and data proposed in this study is good.

5.4 Correlation Analysis

Correlation analysis is used to examine the relationships between random variables. In this study, Pearson correlation analysis is applied to measure the relationships between variables in the theoretical model, with a two-tailed test used to assess the significance of

these correlations and to validate the hypotheses. When the r-value falls between 0.3 and 0.7, it indicates a moderate positive correlation between variables; an r-value between 0.7 and 1 indicates a high positive correlation between variables. Detailed analysis is presented in Table 5.4.

Table 5.4 Variable Correlation

Dimensions	Tangibility	Reliability	Responsiveness	Assurance	Empathy	Brand image	Brand awareness	Brand loyalty	Patient involvement	Brand friendliness	Emotionality	Brand trust	Alignment with brand personality
Tangibility	1												
Reliability	.294**	1											
Responsiveness	.323**	.332**	1										
Assurance	.390**	.280**	.396**	1									
Empathy	.274**	.315**	.411**	.415**	1								
Brand image	.383**	.297**	.335**	.324**	.324**	1							
Brand awareness	.342**	.246**	.316**	.303**	.416**	.334**	1						
Brand loyalty	.175**	.311**	.279**	.301**	.331**	.415**	.340**	1					
Patient involvement	.452**	.345**	.263**	.312**	.304**	.328**	.332**	.351**	1				
Brand friendliness	.324**	.423**	.341**	.303**	.415**	.348**	.402**	.215**	.226**	1			
Emotionality	.223**	.302**	.248**	.278**	.321**	.205**	.388**	.307**	.302**	.342**	1		
Brand trust	.402**	.365**	.316**	.237**	.392**	.208**	.218**	.395**	.355**	.415**	.334**	1	
Alignment with brand personality	.319**	.293**	.248**	.341**	.265**	.198**	.241**	.285**	.343**	.310**	.268**	.311**	1

Note: **. Significant correlation at 0.01 level (bilateral)

Based on the data presented in Table 5.4, the following findings can be summarized:

(1) Correlation between dimensions of medical service quality and other variables

Tangibility, reliability, responsiveness, assurance, and empathy are the core dimensions of medical service quality. Their correlations are all statistically significant ($p < 0.01$), indicating strong interrelationships among these dimensions in evaluating medical service quality.

The correlation between tangibility and assurance (r = .390**) as well as responsiveness (r = .323**) is particularly high, reflecting the synergy between hospital infrastructure, service attitudes, and service capabilities.

Empathy demonstrates strong correlations with responsiveness (r = .411**) and assurance (r = .415**), indicating that patients place high importance on healthcare professionals' responsiveness to their needs and the emotional support provided.

(2) Relationship between brand-related variables and medical service quality

Brand image is significantly correlated with all five dimensions of service quality (ranging from tangibility r = .383** to reliability r = .297**). This suggests that high-quality service experiences contribute to a more positive brand image, particularly when patients perceive modern facilities and excellent service performance.

Brand awareness is significantly correlated with all dimensions of service quality, with the highest correlation observed with empathy (r = .416**). This indicates that patients' emotional experiences with hospital services can effectively enhance brand awareness.

Brand loyalty shows relatively weaker correlations with service quality (ranging from r = .175** to r = .331**), with the strongest correlations observed with reliability (r = .311**) and empathy (r = .331**). This highlights that patients' perceptions of consistent and personalized care are key factors in fostering loyalty.

(3) Relationship between patient involvement and other variables

Patient involvement is significantly correlated with all variables, with the strongest correlation observed with tangibility (r = .452**). This suggests that highly involved patients pay closer attention to the facilities, environment, and overall "visibility" of the healthcare services provided by the hospital.

Patient involvement is also significantly correlated with brand loyalty (r = .351**) and brand trust (r = .355**), indicating that highly involved patients are more likely to develop emotional attachment and trust in the hospital brand. This relationship plays a critical role in driving behavioral loyalty and word-of-mouth promotion.

(4) Correlation between brand dimensions and brand equity

Brand image, brand awareness, and brand loyalty are all significantly correlated (ranging from r = .334** to r = .415**). Brand trust shows strong correlations with brand loyalty (r = .395**) and brand friendliness (r = .415**), highlighting significant positive relationships between brand image, brand awareness, and brand loyalty.

Emotional aspects are significantly correlated with brand awareness (r = .388**) and brand loyalty (r = .307**). This indicates that patients' emotional experiences (e.g., feelings of empathy and safety) influence their brand perceptions and loyalty.

Brand personality consistency is significantly correlated with brand trust (r = .311**) and brand friendliness (r = .310**), suggesting that the personalized characteristics of hospital branding can enhance patient trust and recognition.

In conclusion, the results of the correlation analysis reveal significant relationships among these variables. These findings provide a solid foundation for conducting regression analyses on the six variables—medical service quality, brand image, brand awareness, brand loyalty, patient involvement, and brand equity—in private hospitals.

5.5 Regression analysis

(1) Relationship between service quality and brand equity

Using SPSS software, a correlation analysis was conducted to examine the significant relationship between Service Quality and Brand Equity. This section presents the regression analysis of these two variables, as shown in Table 5.5.

Table 5.5 Regression coefficient test results of Service Quality and Brand equity

| Model | Non standardized | | Standard | t | Sig. | Linear Statistics | |
	B	Std.Error				Tolerance	VIF
(Constant)	0.052	0.004		13.005	0.000		
Tangibility	0.511	0.024	0.414	21.292	0.000	0.425	2.353
Reliability	0.372	0.028	0.217	13.286	0.000	0.436	2.294
Responsiveness	0.319	0.058	0.221	5.502	0.000	0.363	2.755
Assurance	0.593	0.029	0.466	20.448	0.000	0.375	2.667
Empathy	0.464	0.012	0.415	5.269	0.000	0.432	2.315

Based on the standardized coefficient β values and Sig. values ($p < 0.001$) in Table 5.5, Service Quality has a significant positive impact on Brand Equity. Therefore, hypothesis H1 is supported.

(2) Relationship between brand image and brand equity

Using SPSS software, a correlation analysis was conducted to examine the significant relationship between Brand Image and Brand Equity. This section presents the regression analysis of these two variables, as shown in Table 5.6.

Table 5.6 Regression coefficient test results of Brand image and Brand equity

Model	Non standardized		Standard	t	Sig.	Linear Statistics	
	B	Std. Error				Tolerance	VIF
(Constant)	0.075	0.023		3.261	0.000		
Brand image	0.546	0.046	0.342	11.870	0.000	0.452	2.212

According to the standardized coefficient β values and Sig. values ($p < 0.001$) in Table 5.6, Brand Image has a significant positive impact on Brand Equity. Therefore, hypothesis H2 is supported.

(3) Relationship between brand awareness and brand equity

According to the standardized coefficient β values and Sig. values ($p < 0.001$) in Table 5.7, Brand Awareness has a significant positive impact on Brand Equity. Therefore, hypothesis H3 is supported.

Table 5.7 Regression coefficient test results of brand awareness and brand equity

Model	Non standardized		Standard	t	Sig.	Linear Statistics	
	B	Std. Error				Tolerance	VIF
(Constant)	0.069	0.012		5.750	0.000		
Brand awareness	0.311	0.061	0.215	5.098	0.000	0.316	3.165

(4) Relationship between brand loyalty and brand equity

According to the standardized coefficient β values and Sig. values ($p < 0.001$) in Table 5.8, Brand Loyalty has a significant positive impact on Brand Equity. Therefore, hypothesis H4 is supported.

Table 5.8 Regression coefficient test results of Brand loyalty and Brand equity

Model	Non standardized		Standard	t	Sig.	Linear Statistics	
	B	Std. Error				Tolerance	VIF
(Constant)	0.031	0.009		3.444	0.000		
Brand loyalty	0.534	0.047	0.335	11.362	0.000	0.461	2.169

(5) Analysis of the moderating role of patient involvement

Wen et al. believe that when the independent variable, dependent variable, and moderating variable are continuous variables, the moderation effect can be tested using a regression model with a product term and hierarchical regression analysis. Firstly, the dependent variable Y is regressed against the independent variables X and M to obtain the determination coefficient $R1^2$; Secondly, the regression of the dependent variable Y with the independent variables X, M, and the product term XM yields $R2^2$. If the $R2^2$ value is significantly greater than $R1^2$, the moderation effect is significant. In this study, the moderating effect of patient involvement on brand equity was analyzed using hierarchical regression with Service Quality, Brand image, Brand awareness, and Brand loyalty as independent variables.

When conducting a moderation analysis, it is generally necessary to center the independent and moderating variables. If the independent variable is a categorical variable, transformation is needed to create dummy variables. Since demographic variables such as gender, age, and monthly income are categorical and not continuous, this study uses the group with the most significant variance in each demographic category as the reference group before including them in the regression model using forced entry. After centering and transforming variables into dummy forms, the independent and moderating variables are entered stepwise into the equation, and the interaction term between the independent variables and the moderating variable is used to examine the moderating effect of Patient Involvement on the relationships between Service Quality, Brand Image, Brand Awareness, Brand Loyalty, and Brand Equity.

First, the moderating effect of patient involvement on service quality and brand equity.

Table 5.9 Regression analysis of patient involvement as a moderating variable (independent variable: Service Quality)

Predictor variables	Brand equity			
	Model1	Model2	Model3	Model4
Gender	0.237	0.142	0.537	0.052
Age	0.045*	0.016*	0.035*	0.036*
Monthly income	0.041*	0.028*	0.054*	0.035*
Service Quality		0.297***	0.248***	0.205***
Patient involvement			0.642***	0.711***
Service Quality*Patient involvement				0.279*
R^2	0.019	0.125	0.283	0.297
Adjusted R^2	0.021	0.082	0.281	0.276
F	0.502	23.475	67.742	82.455
$\triangle$F		23.475	44.267	14.713
$\triangle R^2$		0.106	0.158	0.014

Note: * represents $p<0.05$, ** represents $p<0.01$, *** $p<0.001$

The analysis results indicate that Brand Equity is the dependent variable for testing the moderating role of Patient Involvement. In the first model, control variables-gender, age, and monthly income-were entered into the equation using the forced entry method (enter), with the results displayed in the table. Gender, age, and monthly income each have a positive impact on Brand Equity, with an R^2 value of 0.008, indicating that these variables and Service Quality together explain 0.8% of the variance in Brand Equity.

Building on the baseline model, Model 2 adds Service Quality as an independent variable, resulting in an F-value of 21.043 for the regression equation, which is significant. Model 2's R^2 value is 0.106, representing 0.098 increases over the baseline Model 1, showing that Service Quality explains 9.8% of the variance in Brand Equity. In Model 3, Patient Involvement is added to Model 2. After adding Patient Involvement, its impact on Brand

Equity is significant (β=0.845, p=0.000), and the model's significance improves.

Model 4 further builds on Model 3 by including the interaction term between Service Quality and Patient Involvement as an independent variable. Model 4 demonstrates a significant improvement over Model 3 ($\triangle$F=2.088), with an F-value of 76.114 for the regression equation, which is significant, and an R^2 increase of 0.011. This indicates that Patient Involvement moderates the relationship between Service Quality and Brand Equity. Therefore, hypothesis H5 is supported.

Second, the moderating effect of patient involvement on brand image and brand equity.

Table 5.10 Regression analysis of patient involvement as a moderating variable (independent variable: brand image)

| Predictor variables | Brand equity | | | |
	Model1	Model2	Model3	Model4
Gender	0.241*	0.148	0.529*	0.058
Age	0.047	0.015*	0.034	0.033**
Monthly income	0.039	0.03*	0.053*	0.036
Brand image		0.292***	0.251***	0.203***
Patient involvement			0.639***	0.719***
Brand image*Patient involvement				0.281**
R^2	0.02	0.128	0.287	0.301
Adjusted R^2	0.023	0.085	0.278	0.279
F	0.495	23.492	67.75	82.46
$\triangle$F		23.492	34.258	24.71
$\triangle R^2$		0.108	0.159	0.014

Note: * represents *p*<0.05, ** represents *p*<0.01, *** *p*<0.001

The analysis results indicate that Brand Equity serves as the dependent variable to examine the moderating effect of Patient Involvement. In the first model, control variables-gender, age, and monthly income-were entered into the equation using the forced entry method (enter), with the results displayed in the table. Gender, age, and monthly income each have a positive impact on Brand Equity, with an R^2 value of 0.02, indicating that these variables and Brand Image together explain 2% of the variance in Brand Equity.

Building on the baseline model, Model 2 adds Brand Image as an independent variable, resulting in an F-value of 23.492 for the regression equation, which is significant. Model 2's R^2 value is 0.128, representing a 0.108 increase over the baseline Model 1, indicating that Brand Image explains 10.8% of the variance in Brand Equity. In Model 3, Patient Involvement is added to Model 2. After adding Patient Involvement, its impact on Brand Equity is significant (β=0.639, p=0.000), and the model's significance improves.

Model 4 further builds on Model 3 by including the interaction term between Brand Image and Patient Involvement as an independent variable. Model 4 demonstrates a significant improvement over Model 3 ($\triangle$F=24.71), with an F-value of 82.46 for the

regression equation, which is significant, and an R^2 increase of 0.014. This indicates that Patient Involvement moderates the relationship between Brand Image and Brand Equity. Therefore, hypothesis H6 is supported.

Third, the moderating role of patient involvement in brand awareness and brand equity.

Table 5.11 Regression analysis of patient involvement as a moderating variable (independent variable: brand awareness)

Predictor variables	Brand equity			
	Model1	Model2	Model3	Model4
Gender	0.23*	0.155	0.55	0.065*
Age	0.051	0.019*	0.039*	0.04*
Monthly income	0.038*	0.032	0.058	0.043
Brand awareness		0.31***	0.26***	0.22***
Patient involvement			0.665***	0.725***
Brand awareness *Patient involvement				0.291*
R^2	0.018	0.135	0.29	0.31
Adjusted R^2	0.02	0.089	0.285	0.28
F	0.51	24.164	71.220	83.015
$\triangle$F		24.164	47.056	11.795
$\triangle R^2$		0.117	0.155	0.02

Note: * represents $p<0.05$, ** represents $p<0.01$, *** $p<0.001$

The analysis results indicate that Brand Equity serves as the dependent variable for testing the moderating role of Patient Involvement. In the first model, control variables-gender, age, and monthly income-were entered into the equation using the forced entry method (enter), with the results displayed in the table. Gender, age, and monthly income each have a positive impact on Brand Equity, with an R^2 value of 0.018, indicating that these variables and Brand Awareness together explain 1.8% of the variance in Brand Equity.

Building on the baseline model, Model 2 adds Brand Awareness as an independent variable, resulting in an F-value of 24.164 for the regression equation, which is significant. Model 2's R^2 value is 0.135, representing a 0.117 increase over the baseline Model 1, indicating that Brand Awareness explains 11.7% of the variance in Brand Equity. In Model 3, Patient Involvement is added to Model 2. After adding Patient Involvement, its impact on Brand Equity is significant (β=0.665, p=0.000), and the model's significance improves.

Model 4 further builds on Model 3 by including the interaction term between Brand Awareness and Patient Involvement as an independent variable. Model 4 demonstrates a significant improvement over Model 3 ($\triangle$F=11.795), with an F-value of 83.015 for the regression equation, which is significant, and an R^2 increase of 0.02. This indicates that Patient Involvement moderates the relationship between Brand Awareness and Brand Equity. Therefore, hypothesis H7 is supported.

Fourth, the moderating effect of patient involvement on brand loyalty and brand equity.

Table 5.12 Regression analysis of patient involvement as a moderating variable (independent variable: brand loyalty)

Predictor variables	Brand equity			
	Model1	Model2	Model3	Model4
Gender	0.245*	0.16	0.57*	0.06*
Age	0.043*	0.014*	0.033	0.035*
Monthly income	0.045	0.029	0.06*	0.037
Brand loyalty		0.315***	0.27***	0.21***
Patient involvement			0.695***	0.705***
Brand loyalty*Patient involvement				0.216*
R^2	0.017	0.13	0.285	0.3
Adjusted R^2	0.022	0.079	0.28	0.275
F	0.498	15.62	67.81	76.19
△F		15.62	52.19	8.38
△R^2		0.113	0.155	0.015

Note: * represents $p<0.05$, ** represents $p<0.01$, *** $p<0.001$

The analysis results indicate that Brand Equity serves as the dependent variable for testing the moderating effect of Patient Involvement. In the first model, control variables-gender, age, and monthly income-were entered into the equation using the forced entry method (enter), with the results displayed in the table. Gender, age, and monthly income each have a positive impact on Brand Equity, with an R^2 value of 0.017, indicating that these variables and Brand Loyalty together explain 1.7% of the variance in Brand Equity.

Building on the baseline model, Model 2 adds Brand Loyalty as an independent variable, resulting in an F-value of 15.62 for the regression equation, which is significant. Model 2's R^2 value is 0.13, representing a 0.113 increase over the baseline Model 1, indicating that Brand Loyalty explains 10.9% of the variance in Brand Equity. In Model 3, Patient Involvement is added to Model 2. After adding Patient Involvement, its impact on Brand Equity is significant (β=0.695, p=0.000), and the model's significance improves.

Model 4 further builds on Model 3 by including the interaction term between Brand Loyalty and Patient Involvement as an independent variable. Model 4 demonstrates a significant improvement over Model 3 (△F=0.017), with an F-value of 76.19 for the regression equation, which is significant, and an R^2 increase of 0.015. This indicates that Patient Involvement moderates the relationship between Brand Loyalty and Brand Equity. Therefore, hypothesis H8 is supported.

To validate the robustness of the above data analysis results, the model was estimated using partial least squares (PLS) structural equation modeling (SEM) (Hair et al., 2017). The analyses proceeded in two steps (Hair et al., 2017), first estimating and evaluating the measurement model's reflective aspects and then the structural model (i.e., structural relationships among the constructs). Thus, empirically robust measures were calculated for

the connections both between items and constructs (i.e., measurement models) and between constructs (i.e., structural model). Service Quality and Brand Equity were treated as second order constructs. To test the moderation hypothesis, in particular, multi-group analysis was conducted using SmartPLS software. A new binary variable was created based on the average of the Patient Involvement Scale items: Low (less than 3) and High (3 or more).

Next, the structural model's path coefficients were examined. A coefficient's significance depends on the standard error obtained using bootstrapping (i.e. 5,000 iterations), which facilitated the calculation of the t- and p-values.

The path coefficients indicate the strength of the direct relationships between variables. The results provide support for hypotheses H2, H3 and H4. In the overall model, Brand Awareness is not statistically significant in explaining Brand Equity. Perceived Service Quality is the dimension with the strongest effect on behavioral intentions.

Table 5.13 Overall sample analysis results

	Coeficient	T statistics	P values
Brand Awareness -> Brand Equity	0.006	0.163	0.871
Brand Image -> Brand Equity	0.066	2.263	0.024
Brand Loyalty -> Brand Equity	0.186	4.320	0.000
Service Quality -> Brand Equity	0.808	24.838	0.000

The multigroup analysis considering two groups – High Involvement and Low Involvement Group supported hypothesis H5, H6, H7 and H8. The impact of Brand Awareness, Brand Image and Brand Loyalty on Brand Equity is stronger for the High Involvement Patient Group and the Impact of Perceived Service Quality is stronger for the Low Involvement Group. As regards Brand Awareness, the path coefficient is statistically significant for the high involvement patient group.

Table 5.14 Multi-Group analysis results (high participation patients vs. low participation patients)

	Coefficient - Difference (Patient Involvement High - Patient Involvement Low)	T Statistics	p value
Brand Awareness -> Brand Equity	0.138	0.013	0.026
Brand Image -> Brand Equity	0.066	0.979	0.042
Brand Loyalty -> Brand Equity	0.093	0.984	0.032
Service Quality -> Brand Equity	-0.196	1.000	0.001

The analysis results indicate that service quality, brand image, and brand loyalty have a positive impact on brand equity, whereas brand awareness does not exhibit a statistically significant effect. Moreover, patient involvement plays a moderating role in the relationship between service quality, brand image, brand awareness, brand loyalty, and brand equity.

The validation results of the hypotheses, based on the regression analysis, are shown in

Table 5.15.

Table 5.15 Research hypothesis verification results

hypothesis	Result
H1: Medical service quality of private hospitals has a significant positive impact on brand equity.	Supported
H2: Brand image of private hospitals has a significant positive impact on brand equity.	Supported
H3: Brand awareness of private hospitals has a significant positive impact on brand equity.	Not Supported
H4: Brand loyalty of private hospitals has a significant positive impact on patient brand equity.	Supported
H5: Patient involvement amplifies the relationship between medical service quality of private hospitals and brand equity.	Supported
H6: Patient involvement amplifies the relationship between the brand image of private hospitals and brand equity.	Supported
H7: Patient involvement amplifies the relationship between the brand awareness of private hospitals and brand equity.	Supported
H8: Patient involvement amplifies the relationship between the brand loyalty of private hospitals and brand equity.	Supported

Based on the hypothesis testing results presented in Table 5.15, this study provides an in-depth analysis of the effects of private hospital medical service quality, brand image, brand awareness, and brand loyalty on brand equity. Additionally, it validates the moderating role of patient involvement in these relationships. The specific findings for each hypothesis are analyzed as follows:

First, the medical service quality of private hospitals has a significant positive impact on patient brand equity (Research hypothesis H1 is supported).

The study found that the quality of medical services in private hospitals significantly and positively impacts patient brand equity. This indicates that high-quality medical services effectively enhance patients' trust and reliance on the hospital brand. Medical service quality, encompassing factors such as diagnostic professionalism, service attitude, and service efficiency, contributes to higher patient satisfaction, thereby encouraging greater recognition of the hospital's brand value. Consequently, private hospitals should continuously optimize the quality of medical services by improving diagnostic technology, enhancing service attitudes, and streamlining healthcare processes to establish a strong foundation for brand equity enhancement.

Second, the brand image of private hospitals has a significant positive impact on patient brand equity (Research hypothesis H2 is supported).

The study confirms the significant positive effect of brand image on brand equity. A favorable brand image strengthens patients' trust and emotional connection with the hospital, increasing their willingness to choose and recommend it. These findings highlight the importance of cultivating a professional, reliable, and socially responsible brand image.

Private hospitals can achieve this by engaging in public welfare activities, promoting health education, and showcasing advanced technical capabilities, thereby enhancing their perceived image among patients and reinforcing brand equity.

Third, the brand awareness of private hospitals does not have a significant positive impact on patient's brand equity (Research hypothesis H3 is not supported).

The impact of brand awareness on brand equity did not reach statistical significance. This finding suggests that while brand awareness enhances consumers' recognition of a brand, it does not directly determine brand equity, particularly in the healthcare industry. Patients tend to rely more on service quality and word-of-mouth rather than making decisions based solely on brand awareness. Moreover, in the private hospital market, patients are more concerned with the core values of the brand, such as healthcare service quality, the professional competence of medical staff, and the hospital's reputation, rather than mere brand exposure.

Fourth, the brand loyalty of private hospitals has a significant positive impact on patient brand equity (Research hypothesis H4 is supported).

The study verifies the positive effect of brand loyalty on brand equity. Loyal patients are more inclined to repeatedly choose hospital services and recommend them to others, which not only boosts hospital revenue but also enhances the hospital's brand influence through word-of-mouth promotion. Private hospitals should focus on establishing long-term patient relationship management systems, optimizing membership services, and providing value-added services to further strengthen patient loyalty and enhance brand equity.

Fifth, patient involvement moderates the relationship between medical service quality and brand equity in private hospitals (hypothesis H5 is supported).

The study confirms that patient involvement plays a moderating role in the relationship between medical service quality and brand equity. High-involvement patients pay greater attention to the quality of medical services and evaluate hospital brand equity based on their service experiences. To cater to these patients, hospitals can provide more personalized service experiences, such as establishing dedicated patient service teams and strengthening patient-doctor communication, thereby enhancing their brand identification and further improving brand equity.

Sixth, patient involvement moderates the relationship between brand image and brand equity in private hospitals (hypothesis H6 is supported).

Patient involvement significantly enhances the impact of brand image on brand equity. High-involvement patients are more sensitive to the perception of the hospital's brand image and are more likely to exhibit loyal behavior influenced by this perception. Hospitals can

improve the patient experience, strengthen emotional connections, and deliver consistent brand messaging across online and offline channels to increase high-involvement patients' identification with the brand image, further contributing to brand equity.

Seventh, patient involvement moderates the relationship between brand awareness and brand equity in private hospitals (hypothesis H7 is supported).

The findings indicate that patient involvement amplifies the effect of brand awareness on brand equity. High-involvement patients not only exhibit greater sensitivity to brand awareness but also actively disseminate brand information, thereby enhancing the brand's influence. Hospitals should enhance interactions with high-involvement patients, such as through social media campaigns and patient feedback mechanisms, to further strengthen the impact of brand awareness on brand equity.

Eighth, patient involvement moderates the relationship between brand loyalty and brand equity in private hospitals (hypothesis H8 is supported).

The moderating role of patient involvement in the relationship between brand loyalty and brand equity has also been validated. High-involvement patients demonstrate stronger dependency on and emotional connection with the hospital brand, making the positive effects of brand loyalty on brand equity more pronounced. Private hospitals should prioritize high-involvement patients by optimizing membership services and providing personalized health management plans to further solidify brand loyalty and enhance brand equity.

In summary, this study confirms the positive impacts of medical service quality, brand image, brand awareness, and brand loyalty on brand equity in private hospitals, with patient involvement playing a significant moderating role in all these relationships. In brand management, private hospitals should consider the varying levels of patient involvement, offering personalized services to high-involvement patients to enhance their brand identification. Simultaneously, by optimizing service quality, shaping brand image, and enhancing brand awareness and loyalty, hospitals can achieve comprehensive improvement in brand equity.

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Chapter 6: Discussion of Results

6.1 The relationship between medical service quality and brand equity in private hospitals

Data analysis reveals that the quality of medical services in private hospitals has a significant positive impact on hospital brand equity. This result indicates that higher medical service quality effectively enhances brand equity for private hospitals. Specifically, when a hospital provides professional medical services, a comfortable environment, and high levels of patient care, patients' trust, loyalty, and overall brand perception are correspondingly strengthened. This positive influence is particularly crucial in today's highly competitive healthcare market, where brand equity plays a key role in driving patient loyalty and enhancing a hospital's competitive advantage.

Similar findings appear in recent research. For example, Lee et al. (2021) examined the relationship between medical service quality and brand equity, identifying a close connection among service quality, brand image, patient satisfaction, and loyalty, especially within private hospital settings. They found that when service quality improves, patients are more likely to trust the hospital and choose to return, which significantly boosts brand loyalty and brand identification. Additionally, Ryu and Han (2020) observed in their study of Korean private hospitals that the positive impact of service quality on brand image is further reinforced by patient satisfaction and loyalty, contributing to the accumulation of brand equity.

However, despite this consistency in trends, this study differs from previous research by exploring specific elements of service quality. For instance, this study emphasizes the roles of professional medical expertise and emotional support for patients, whereas Lee et al. (2021) focused more on the impact of hospital facilities on brand equity. This comparison highlights that different elements may have varying levels of influence on brand equity, but overall, high-quality medical services provide substantial support for brand equity in private hospitals.

In summary, the results of this study not only support the existing literature on the positive relationship between medical service quality and brand equity but also extend the understanding of specific service quality components, offering insights for future brand management strategies in private hospitals.

6.2 The relationship between brand image and brand equity in private hospitals

Data analysis indicates a significant positive impact of brand image on brand equity in private hospitals. This finding suggests that private hospitals can effectively enhance their brand equity by establishing a positive, professional, and trustworthy brand image. As patients' first impression of a hospital, brand image often influences their trust and loyalty. For private hospitals, building a strong brand image is not only vital for expanding market share but also plays a crucial role in shaping and reinforcing long-term patient recognition and positioning.

This finding aligns with recent research. For example, Kim et al. (2022) noted that brand image significantly impacts brand equity, particularly in healthcare, where patients are more inclined to choose hospitals with a positive brand image, perceiving them as more reliable and professional. Huang and Wang (2021) also confirmed a close relationship between brand image, brand loyalty, and patient satisfaction, which in turn significantly influences brand equity. They found that brand image not only affects patient trust but also enhances satisfaction and loyalty, thus boosting brand equity.

Although this study's results are largely consistent with Kim et al. (2022) and Huang and Wang (2021), this study emphasizes the impact of different dimensions of brand image—such as professional image, trustworthiness, and emotional connection—on brand equity, whereas Kim et al. (2022) focused more on the overall role of brand image. Huang and Wang (2021), in contrast, explored how brand image strengthens brand equity through patient loyalty but did not break down the specific elements of brand image.

In summary, this study not only supports existing literature on the positive impact of brand image on brand equity but also provides a more detailed examination of specific brand image dimensions, offering further management insights for private hospitals on how to enhance brand equity from a brand image perspective.

6.3 The relationship between brand awareness and brand equity in private hospitals

Based on data analysis, it is evident that the brand awareness of private hospitals does not have a significant impact on hospital brand equity. Although Zhang et al. (2022) pointed out in their study that brand awareness is one of the core components of brand equity,

significantly influencing brand loyalty and brand identification. Their findings suggest that an increase in brand awareness enhances patients' preference for a particular hospital, thereby improving their brand loyalty and identification to some extent. Additionally, the study by Li and Chen (2021) also demonstrated that brand awareness not only enhances patients' trust but also drives greater attention from potential patients through positive word-of-mouth effects, ultimately strengthening hospital brand equity.

However, a report by Roland Berger Consulting in 2022 emphasized that while healthcare institutions can draw on branding strategies from consumer industries, merely increasing brand awareness is insufficient to create long-term value. They argued that healthcare service providers should first conduct an in-depth brand analysis to identify key brand value propositions, then align these value points with appropriate messaging and content, and finally integrate them into the core patient journey using suitable communication touchpoints to maximize brand impact. This indicates that brand awareness alone is not enough; it must be combined with brand identity, service quality, and other factors to effectively enhance brand equity (Roland Berger, 2022).

In conclusion, although some studies have identified brand awareness as a crucial factor influencing brand equity, in the context of this study, its impact was found to be statistically insignificant. This finding suggests that when choosing healthcare services, patients place greater emphasis on hospital service quality and brand image rather than brand awareness alone. Therefore, private hospitals should adopt a comprehensive approach to brand building, considering multiple factors to effectively enhance their brand equity.

6.4 The relationship between brand loyalty and brand equity in private hospitals

Data analysis reveals a significant positive impact of brand loyalty on brand equity in private hospitals. Brand loyalty is an essential indicator of repeat patient visits and active hospital recommendations, directly affecting the hospital's market competitiveness and long-term brand stability. In private hospitals, high brand loyalty signifies a strong patient recognition of the hospital's service quality and professionalism. This trust not only results in higher revisit rates but also attracts new patients through positive word-of-mouth, thereby enhancing the hospital's brand equity.

The conclusions of this study are largely consistent with recent literature. For instance, Chen et al. (2023) found that brand loyalty is a critical driver of hospital brand equity,

especially in the service industry, where loyal patients are more likely to recommend the hospital, resulting in a strong word-of-mouth effect. Additionally, Lee and Park (2022) confirmed that brand loyalty contributes to brand equity by enhancing patient trust and recognition of the hospital brand. They further noted that in private healthcare, the impact of brand loyalty on brand equity is particularly significant, as patient revisits and recommendations directly influence the hospital's market position and trustworthiness.

While the findings are generally aligned, this study diverges in perspective from another research. For example, Chen et al. (2023) focused on the indirect enhancement of brand equity through the word-of-mouth effect of brand loyalty, while this study emphasizes the direct impact of loyalty. Moreover, Lee and Park (2022) highlighted the role of patients' emotional connection in fostering loyalty in their analysis of loyalty's components, whereas this study explores the influence of brand loyalty on brand equity from the perspective of trust and recommendation behaviors. This comparison illustrates that while the importance of brand loyalty is widely recognized, each study offers a unique understanding of its specific mechanisms.

In conclusion, this study's results not only support existing research on the positive impact of brand loyalty on brand equity but also further analyze the direct and indirect influence pathways of brand loyalty in private hospitals. This offers a new perspective for private hospitals to consider in brand management strategies aimed at enhancing brand equity through increased brand loyalty.

6.5 The moderating role of patient involvement in the relationship between medical service quality and brand equity in private hospitals

Data analysis reveals that patient involvement moderates the relationship between medical service quality and brand equity in private hospitals. Specifically, higher patient involvement enhances the positive impact of medical service quality on brand equity compared to lower levels of involvement. This finding suggests that when patients are more engaged and attentive to the medical services they receive, they are more likely to perceive the value of service quality. This positive perception then translates into trust and loyalty toward the hospital brand, thereby increasing brand equity.

This finding aligns with recent studies. For example, Kim et al. (2022) highlighted that patient involvement significantly influences the degree to which service quality contributes to brand equity within the healthcare industry. Their research found that highly involved patients

are more sensitive to the perception of service quality, making them more inclined to trust and remain loyal to brands providing high-quality services, thereby strengthening brand equity. Additionally, Cheng and Li (2021) examined the role of patient involvement across different healthcare contexts and found that high involvement deepens patients' recognition of service quality, reinforcing brand equity accumulation through increased patient loyalty and positive reviews.

While the results of this study generally align with these prior findings, there are notable differences. Kim et al. (2022) primarily focused on the emotional dimension of patient involvement, emphasizing the impact of emotional engagement on perceptions of service quality. This study, however, further explores the multidimensional composition of involvement, including emotional, cognitive, and behavioral aspects, and their distinct moderating effects on brand equity. Moreover, Cheng and Li (2021) concentrated on how varying healthcare contexts influence the moderating effect of involvement, without specifically addressing private hospital settings. In contrast, this study emphasizes that high patient involvement within private hospitals significantly enhances the positive impact of service quality on brand equity.

In conclusion, this study not only confirms the moderating role of patient involvement in the relationship between medical service quality and brand equity but also extends the understanding of involvement's impact within the private hospital context. This provides more detailed insights for brand management, suggesting that by increasing patient involvement, private hospitals can more effectively translate high-quality services into brand equity. This finding is highly relevant for hospital brand management strategies.

6.6 The moderating role of patient involvement in the relationship between brand image and brand equity in private hospitals

Data analysis indicates that patient involvement moderates the relationship between brand image and brand equity in private hospitals. Specifically, higher patient involvement amplifies the positive impact of brand image on brand equity compared to lower levels of involvement. This means that a strong brand image in private hospitals is more likely to inspire loyalty and identification among highly involved patients, thereby enhancing brand equity. This finding suggests that private hospitals should focus not only on building a compelling brand image but also on increasing patient engagement and interaction to more effectively convert brand image into tangible brand equity.

This result is consistent with recent studies. For example, Park and Kim (2023) found that patient involvement plays a crucial moderating role between brand image and brand equity in healthcare services. Highly involved patients are more inclined to value the brand image of medical institutions, thereby fostering strong brand loyalty and ultimately enhancing brand equity. Their study suggested that high patient involvement not only strengthens identification with the hospital but also drives the accumulation of brand equity through emotional connections. Similarly, Wang et al. (2022) found that patient involvement positively moderates the influence of brand image, as highly involved patients tend to respond more favorably to brand image, thereby further elevating brand value.

While this study's findings generally align with those of Park and Kim (2023) and Wang et al. (2022), the perspectives differ somewhat. Park and Kim (2023) primarily analyzed the moderating effect of emotional involvement on the relationship between brand image and brand equity, whereas this study examined the combined effects of emotional and behavioral involvement on this relationship. Additionally, Wang et al. (2022) focused on the appeal of external brand image presentations (such as advertisements and brand events) to highly involved patients, whereas this study emphasizes the perceived effectiveness of brand image within the service experience of private hospitals.

In conclusion, this study further validates the moderating role of patient involvement in the relationship between brand image and brand equity, expanding the understanding of multiple dimensions of patient involvement within the context of private hospitals. This provides new strategic insights for enhancing brand equity, suggesting that by increasing patient involvement, private hospitals can more effectively transform brand image into brand equity, thereby strengthening their competitive advantage in the healthcare market.

6.7 The moderating role of patient involvement in the relationship between brand awareness and brand equity in private hospitals

Data analysis indicates that patient involvement moderates the relationship between brand awareness and brand equity in private hospitals. Specifically, higher patient involvement amplifies the positive impact of brand awareness on brand equity compared to lower levels of involvement. This suggests that when patient engagement is high, they are more likely to actively perceive and promote the hospital's brand awareness, thereby driving the accumulation of brand equity. By increasing patient involvement, private hospitals can more effectively convert brand awareness into actual brand equity, a crucial advantage in a highly

competitive healthcare market.

This conclusion aligns with recent research. For instance, Liu and Chen (2022) found that in the service industry, patient involvement has a particularly significant moderating role between brand awareness and brand equity. Highly involved patients tend to pay more attention to and understand the brand, actively disseminating the hospital's brand information, which enhances brand equity. Their study showed that highly involved patients can more effectively transform the advantages of brand awareness into loyalty and trust in the brand, thereby increasing the hospital's brand value. Similarly, Yang and Wang (2021) demonstrated that patient involvement significantly facilitates the impact of brand awareness on brand equity by strengthening patients' memory and identification with brand information.

However, this study diverges in perspective from previous research. For example, Liu and Chen (2022) focused on how involvement affects patients' memory and dissemination of brand information, while this study further explores the different dimensions of involvement—such as emotional and cognitive involvement—and how they jointly influence the relationship between brand awareness and brand equity. Additionally, Yang and Wang (2021) emphasized the role of promotional activities in stimulating patient involvement, highlighting the indirect path through which brand awareness enhances involvement via marketing. In contrast, this study focuses on the direct effect of involvement within the actual healthcare experience in a private hospital setting.

In conclusion, this study further supports the moderating role of patient involvement between brand awareness and brand equity and expands the understanding of various involvement dimensions in the context of private hospitals. This provides new insights for brand management strategies, suggesting that by increasing patient involvement, private hospitals can more effectively transform brand awareness into brand equity, enhancing brand competitiveness and loyalty.

6.8 The moderating role of patient involvement in the relationship between brand loyalty and brand equity in private hospitals

Data analysis indicates that patient involvement moderates the relationship between brand loyalty and brand equity in private hospitals. Specifically, higher patient involvement amplifies the positive impact of brand loyalty on brand equity compared to lower levels of involvement. This suggests that when patients have a higher level of attention to and engagement with the hospital brand, they not only demonstrate stronger loyalty but also

contribute to brand equity through more active word-of-mouth promotion and repeated choices. Private hospitals can enhance brand loyalty and solidify brand equity by adopting measures to increase patient involvement.

This finding aligns with recent studies. For example, Chen et al. (2023) found that patient involvement significantly moderates the relationship between brand loyalty and brand equity. Highly involved patients tend to have a strong emotional attachment to the brand, making it easier to form positive brand impressions and contribute more to brand equity through recommendations. Additionally, Lee and Park (2022) noted that patient involvement significantly strengthens the impact of brand loyalty on brand equity, especially in private hospital settings, where highly involved patients have a deeper emotional connection to the brand, thereby amplifying the positive effects of brand loyalty.

While this study's results align with these findings in general trends, there are differences in focus. Chen et al. (2023) primarily analyzed how patient involvement impacts brand equity through emotional loyalty, whereas this study further explores multiple dimensions of involvement, including cognitive and behavioral involvement, and their distinct moderating effects on the relationship between brand loyalty and brand equity. Additionally, Lee and Park (2022) emphasized the varying roles of involvement across different hospital contexts, while this study focuses more directly on private hospitals to explore the direct and indirect influences of involvement on the brand loyalty–brand equity relationship.

In conclusion, this study not only confirms the moderating role of patient involvement between brand loyalty and brand equity but also analyzes the effects of different dimensions of involvement within the context of private hospitals. This offers a new perspective for private hospital brand management, suggesting that by effectively increasing patient involvement, hospitals can further translate brand loyalty into brand equity, thereby enhancing market competitiveness.

Chapter 7: Research Conclusions and Prospects

7.1 Research conclusions

First, the quality of medical services in private hospitals has a significant positive impact on brand equity. The findings indicate that high-quality medical services directly enhance the brand equity of private hospitals. Superior service quality not only improves patient satisfaction but also strengthens patient trust and reliance on the hospital, leading to greater loyalty and an improved overall evaluation of the hospital. This result suggests that private hospitals should prioritize service quality improvements to enhance patient experience and boost market competitiveness and brand value.

Second, brand image in private hospitals has a significant positive impact on brand equity. Brand image plays a critical role in brand equity, influencing patients' overall perception and emotional connection with the hospital. By cultivating a professional and reliable brand image, private hospitals can improve patient recognition and trust in the brand. This positive impact highlights the need for hospitals to build a positive, trustworthy brand image by strengthening brand culture, the professional image of healthcare staff, and service attitudes, thereby fostering patients' trust in the brand.

Third, brand awareness in private hospitals does not have a significant positive impact on brand equity. The impact of brand awareness on brand equity did not reach statistical significance. This suggests that in the context of private hospitals, increasing brand awareness alone is insufficient to directly enhance brand equity, as patients' recognition of a brand does not automatically translate into brand value perception. This phenomenon is closely related to the unique characteristics of the healthcare industry, where patients prioritize factors such as the hospital's professional competence, reputation, and actual service experience over mere brand exposure when choosing medical services. Therefore, private hospitals should not rely solely on increasing brand awareness to strengthen brand equity.

Fourth, brand loyalty in private hospitals has a significant positive impact on brand equity. The results also show that brand loyalty has a strong positive effect on brand equity. Patient loyalty fosters continued trust and referrals, creating a positive brand reputation and further strengthening brand equity. Private hospitals can enhance patient satisfaction and trust to

establish long-term patient relationships, converting loyalty into a core brand asset. Building a stable patient base is essential for strengthening the brand equity of private hospitals.

Fifth, patient involvement moderates the relationship between medical service quality and brand equity in private hospitals, meaning that higher patient involvement enhances the positive effect of medical service quality on brand equity compared to lower involvement. The study found that patient involvement significantly boosts the positive impact of medical service quality on brand equity. Specifically, highly involved patients are more likely to understand the hospital's services in depth and to perceive and evaluate service quality positively, which further promote brand equity. Compared to patients with low involvement, those with high involvement are more likely to develop trust and reliance on high-quality medical services, laying the foundation for brand equity accumulation. Therefore, private hospitals can encourage greater patient involvement to enhance perceptions of service quality and further promote brand equity growth.

Sixth, patient involvement moderates the relationship between brand image and brand equity in private hospitals, with higher patient involvement enhancing the positive impact of brand image on brand equity compared to lower involvement. The findings reveal that patient involvement plays a positive moderating role between brand image and brand equity; highly involved patients are more likely to be attracted to and identify with the brand image of private hospitals, thereby strengthening brand equity. These patients typically pay closer attention to the hospital's reputation, culture, and service environment, meaning that when the brand image is strong, their brand identification and trust are also higher. This finding suggests that private hospitals can effectively enhance the impact of brand image on brand equity by building a high-quality brand image and increasing patient involvement.

Seventh, patient involvement also moderates the relationship between brand awareness and brand equity in private hospitals, with higher involvement enhancing the positive impact of brand awareness on brand equity compared to lower involvement. The study further shows that patient involvement plays an important moderating role between brand awareness and brand equity. Specifically, the positive impact of brand awareness on brand equity is more prominent among highly involved patients. These patients are more sensitive to brand information, not only recognizing the brand but also willing to promote and recommend it in various settings, which contribute to brand equity. Therefore, private hospitals can deepen patients' understanding of the brand and increase their involvement, thereby amplifying the impact of brand awareness on brand equity.

Eighth, patient involvement moderates the relationship between brand loyalty and brand

equity in private hospitals, with higher involvement enhancing the positive impact of brand loyalty on brand equity compared to lower involvement. The findings indicate that patient involvement has a significant moderating effect on the relationship between brand loyalty and brand equity. Compared to low-involvement patients, highly involved patients demonstrate deeper loyalty to the hospital brand, are more likely to choose and recommend the hospital repeatedly. This loyalty not only raises patient brand loyalty scores but also turns patients into "advocates" of the hospital brand, strengthening the cumulative effect on brand equity. Highly involved patients tend to form a long-term reliance on the brand, thereby positively promoting the growth of brand equity in private hospitals.

In summary, this study reveals four main pathways for enhancing brand equity in private hospitals: optimizing medical service quality, building a positive brand image, and strengthening brand loyalty. These conclusions provide a clear direction for private hospitals' branding strategies, suggesting a combined focus on service quality and brand development to achieve sustained growth in brand equity and long-term sustainability. Additionally, this study highlights that patient involvement has a positive moderating effect on the relationships between medical service quality, brand image, brand awareness, brand loyalty, and brand equity in private hospitals. This finding reveals the crucial role of increasing patient involvement; by encouraging patients' attention to and participation in the brand, private hospitals can effectively amplify the positive impact of service quality, brand image, awareness, and loyalty on brand equity, thereby achieving sustained brand growth. This provides a clear strategic guide for private hospitals, emphasizing that by increasing patient involvement and optimizing brand elements, they can achieve long-term value growth in brand equity.

7.2 Research contribution

First, this study enriches the theoretical foundation of brand equity for private hospitals. Existing research primarily focuses on brand equity development in commercial sectors, while studies on brand equity in private hospitals remain limited. By integrating brand equity theory with medical service quality, brand image, and brand loyalty, this study identifies the key factors in forming brand equity within private hospitals, expanding the application of brand equity theory in the healthcare industry and addressing gaps in this field.

Second, this study introduces a novel perspective by proposing patient involvement as a moderating variable, providing a new framework for brand equity research. Discussions on

patient involvement in existing literature are relatively limited, and few studies incorporate it as a moderating variable in the brand equity framework. The findings reveal that patient involvement has a significant positive moderating effect on the relationships between medical service quality, brand image, brand awareness, brand loyalty, and brand equity. This suggests that by enhancing patient involvement, private hospitals can significantly amplify the positive influence of brand-building elements on brand equity, providing a theoretical foundation for future research.

Third, the empirical findings of this study offer actionable recommendations for brand-building practices in private hospitals. The results show that improving service quality, fostering a positive brand image, increasing brand awareness, and strengthening brand loyalty all effectively promote brand equity, with patient involvement playing a crucial role in this process. These findings provide a clear brand management strategy for private hospitals: by increasing patient engagement and emotional connection with the brand, hospitals can effectively enhance brand equity. These practical recommendations offer important guidance for private hospitals to achieve higher brand value in an increasingly competitive market.

By expanding the theoretical framework, introducing a new variable, and offering practical recommendations, this study makes valuable theoretical and practical contributions to the research and development of brand equity in private hospitals.

7.3 Research innovations

This study innovatively applies brand equity theory to the brand-building context of private hospitals, enriching the theoretical framework of this field. Previous studies have primarily focused on the application of brand equity in commercial brands, the retail industry, and manufacturing, with relatively little attention given to the healthcare sector, particularly the construction of brand equity in private hospitals. Existing research on branding in the healthcare industry has mainly examined the impact of hospital brand image or medical service quality on brand perception, while relatively few studies have explored the overall mechanism underlying brand equity formation. This study addresses these limitations by systematically analyzing the effects of medical service quality, brand image, brand awareness, and brand loyalty on brand equity in private hospitals. By doing so, it extends the application of brand equity theory to the healthcare sector and provides a novel research perspective for private hospital brand management.

Another major innovation of this study is the introduction of patient involvement as a

moderating variable, exploring its moderating role in private hospital brand-building. Few studies in the existing literature address the moderating effect of patient involvement on brand equity development, particularly within the healthcare field. The findings of this study reveal that patient involvement significantly moderates the impact of medical service quality, brand image, brand awareness, and brand loyalty on brand equity. In other words, higher patient involvement strengthens the positive effects of these brand elements on brand equity. This discovery not only uncovers the complex relationship between patient involvement and brand equity but also provides new avenues for future research.

Focusing on the brand-building strategies of private hospitals, this study offers systematic empirical evidence and strategic recommendations to help private healthcare institutions enhance brand value in a competitive market. The empirical research highlights that by improving medical service quality, fostering a positive brand image, increasing brand awareness, and strengthening brand loyalty—while actively increasing patient involvement—private hospitals can effectively build and enhance brand equity. These practical recommendations not only guide brand management in private hospitals but also contribute to the theoretical framework of healthcare brand management.

7.4 Implications for management

7.4.1 Enhancing medical service quality

The data analysis results of this study indicate that medical service quality has a significant positive impact on brand equity. Therefore, improving medical service quality is essential for increasing brand equity in private hospitals. High-quality medical services not only directly affect patient satisfaction and loyalty but also significantly enhance patient trust in the hospital, promoting growth in brand equity. Below are specific measures across seven areas: professional training, service process optimization, personalized service, humane management, patient feedback mechanisms, information management, and infection control and safety standards.

(1) Strengthening professional training for healthcare staff

The professional competence of healthcare providers is the cornerstone of medical service quality. To ensure the stability and continuous improvement of medical services, private hospitals must prioritize professional training and career development for their medical staff.

Hospitals should regularly organize professional skill training and assessments, offering

courses on standardized medical procedures, the operation of new equipment, and patient communication and psychological support. These initiatives not only enhance clinical skills but also improve providers' overall competence in patient communication and emotional support. In addition, hospitals can also improve the ability of medical staff to respond to medical emergencies through simulation drills, case analysis and other methods, ensuring that high-quality medical services cover every link.

Encouraging healthcare professionals to actively participate in national and international medical conferences, academic meetings, and professional forums enables them to stay abreast of cutting-edge medical knowledge and industry trends. Applying these advancements in clinical practice is particularly critical in an era of increasing internationalization in healthcare. Hospitals may also invite external expert teams to conduct specialized training, providing diverse learning and growth opportunities for their staff. By establishing cooperation mechanisms with international academic institutions or well-known hospitals, hospitals can further expand the professional vision of medical staff and enhance the technical level and innovation ability of the overall medical team.

Additionally, hospitals should establish a comprehensive performance evaluation system that integrates training outcomes, service performance, and patient satisfaction into the assessment criteria. Analyzing patient feedback and service quality metrics can help evaluate the actual impact of training on service improvement. Such incentive mechanisms not only motivate healthcare providers to enhance their professional capabilities but also reinforce their sense of responsibility and enthusiasm for patient care, fostering a culture of high-quality medical services. In addition, hospitals can combine performance appraisal results to provide incentives such as career advancement and bonus rewards to outstanding medical staff to further enhance the overall enthusiasm and professional level of the team.

(2) Optimizing medical service processes to improve efficiency

The efficiency of medical service processes significantly impacts patients' healthcare experiences. Complicated and cumbersome procedures can exacerbate dissatisfaction and even affect perceptions of the hospital's brand. Private hospitals can adopt the following strategies to streamline processes and improve patient satisfaction.

Simplifying healthcare procedures is a starting point. By introducing modern management tools, hospitals can enhance consultation efficiency. For example, implementing self-service registration systems and one-stop service centers can reduce waiting times for registration, payment, examinations, and medication collection. A one-stop service approach addresses multiple patient needs at once, minimizing unnecessary delays caused by overly complicated

procedures. Hospitals can also set up digital systems for accessing diagnostic and treatment results, allowing patients to track progress in real-time and reducing anxiety. Hospitals can also optimize information systems to ensure smooth information connection between various links, thereby improving the work efficiency of medical staff and avoiding delays or errors caused by manual operations.

Guide services play a vital role in improving the patient experience. Hospitals should establish dedicated guide desks at entrances, where staff can assist patients with registration, consultation, examinations, and payments. These services help first-time visitors navigate the hospital system quickly and alleviate any confusion or frustration caused by unfamiliarity with the process. The professionalism and enthusiastic service of guide staff can also indirectly enhance the hospital's brand image. In order to further improve service quality, hospitals can provide professional training to medical guides to improve their communication skills and patient service awareness, so as to ensure that patients receive more humane help during the medical process.

Moreover, process optimization should focus on detail management. Clear and prominent signage in all functional areas can help patients locate their destinations efficiently. For waiting areas, real-time queue information displays or voice announcement systems can keep patients informed and reduce unnecessary waiting-related anxiety. For elderly or mobility-impaired patients, hospitals can provide wheelchair access or companion services to further enhance the patient experience. At the same time, hospitals can explore "intelligent navigation systems" to guide patients to quickly find treatment departments through mobile phone applications or touch screen terminals, further improving the convenience of medical treatment.

To ensure continuous improvement, hospitals should regularly collect patient feedback through surveys or online reviews to understand their experiences and concerns. Adjusting processes based on this feedback ensures that each step meets patients' needs. Optimizing medical processes not only improves patient satisfaction but also enhances operational efficiency, creating a virtuous cycle between service quality and brand equity. In addition, hospital management should establish a continuous improvement mechanism, hold quality improvement meetings regularly, analyze operational data and propose optimization plans to ensure that the optimization of medical processes always meets the actual needs of patients.

(3) Providing a personalized service experience

Personalized service is a vital approach for private hospitals to meet patient needs and enhance patient satisfaction. Given the diverse health conditions and requirements of different

patients, hospitals need to provide customized medical services tailored to individual characteristics. Targeted services allow patients to feel valued, increasing their loyalty to and trust in the hospital's brand.

For chronic disease patients, hospitals can establish long-term health records, documenting medical history, diagnostic data, and treatment plans to provide regular follow-up services and health guidance. For instance, patients with chronic conditions such as hypertension or diabetes require ongoing management. Hospitals can offer personalized dietary and exercise recommendations and conduct routine checkups to monitor their health. This continuous, tailored health management not only helps patients control their conditions more effectively but also conveys the hospital's commitment to their well-being, strengthening trust. In addition, hospitals can use smart health management platforms to provide value-added services such as online consultation and health reminders through APP or WeChat mini-programs, so that patients can get professional health guidance at any time.

For high-end patients, VIP services can cater to their demand for premium healthcare. Private hospitals can design convenient service processes for VIP patients, such as priority registration, expedited diagnostic procedures, and private wards. During hospitalization, VIP patients can benefit from high-quality nursing care and comfortable medical environments, including personal care teams, tailored meal options, and recreational facilities. These services significantly enhance satisfaction among high-end patients and, through positive word-of-mouth, attract more patients from similar demographics. Hospitals can launch membership-based health management services to provide VIP patients with exclusive medical resources such as regular physical examinations and private doctor consultations to enhance patient stickiness and improve brand loyalty.

In inpatient areas, hospitals can provide home-like service environments to create warmth and comfort for patients. This could include incorporating home-style elements into ward designs, such as lounge sofas, televisions, and soft lighting for a more inviting atmosphere. Additionally, hospitals can organize interactive activities for long-term inpatients and their families, such as health seminars or recreational events, helping patients reduce psychological stress and enhance their well-being during treatment. Hospitals can also introduce psychological counseling services to provide psychological support for long-term hospitalized patients, reduce anxiety and loneliness during hospitalization, and improve the overall medical experience.

By offering personalized medical services, private hospitals can not only address individual patient needs but also improve satisfaction, trust, and loyalty, laying a strong

foundation for enhancing their brand image and equity.

(4) Implementing human-centered management and focusing on patients' emotional needs

The quality of healthcare services is reflected not only in technical expertise and processes but also in the emotional experiences of patients. Humanized management focuses on meeting patients' psychological and emotional needs through warm and considerate services, ensuring they feel respected and cared for throughout their medical journey.

Healthcare providers should maintain patience and empathy when communicating with patients. Using gentle language, calm tones, and appropriate body language (e.g., smiling and nodding) can help alleviate patient anxiety, especially for first-time visitors or those facing serious illnesses. Thoughtful emotional care can reduce patient stress and build confidence in their treatment. For example, hospitals could offer specialized psychological counseling services for patients with critical illnesses, where trained psychologists assist patients and their families in coping with emotional pressure, enhancing their acceptance of and cooperation with treatment plans. Hospitals can also enhance patients' psychological support and mutual assistance by regularly holding patient support group activities, forming a dual guarantee of treatment and psychological healing.

Humanized management can also be reflected in the design of ward environments and dietary arrangements. Patient rooms can be outfitted with diverse furniture options, green plants, and soft lighting to create a comfortable setting. Hospitals could also provide nutritionally balanced meals tailored to patient preferences, particularly personalized menus for those with specific dietary needs due to their medical conditions. These measures not only improve patients' perceptions of hospital services but also contribute to better treatment outcomes. Hospitals can also invite nutritionists to work with patients to develop personalized healthy menus to ensure that the diet plan meets the patient's health needs and thus improves treatment outcomes.

Additionally, hospitals can establish quiet, welcoming relaxation areas for patients and their families. For instance, creating book lounges or relaxation zones in outpatient or inpatient departments gives patients a place to rest and unwind while waiting. Such thoughtful design enhances patient satisfaction and demonstrates the hospital's attention to patient needs. Hospitals can further create a peaceful atmosphere that helps patients recover through soothing methods such as music therapy and aromatherapy.

Humanized management should also address the unique needs of specific patient groups. For pediatric patients, dedicated play areas can make the healthcare experience more enjoyable and less intimidating. For elderly patients, hospitals can provide barrier-free

facilities and escort services to help them navigate the medical process more smoothly. These detailed, attentive services significantly improve the healthcare experience and emotional connection patients feel toward the hospital, fostering a stronger sense of trust and reliance.

(5) Establishing a comprehensive patient feedback mechanism for continuous service improvement

Patient feedback serves as a crucial foundation for hospitals to identify issues and enhance service quality. Developing an efficient patient feedback mechanism enables hospitals to understand patient needs and expectations in real time, identify service shortcomings, and drive continuous improvement. Private hospitals can collect patient feedback through multiple channels, including online satisfaction surveys, follow-up calls, suggestion boxes, and social media platforms. This diversified approach ensures broad collection of patient opinions and suggestions, providing comprehensive data to support hospital management decisions.

To manage feedback effectively, hospitals should establish dedicated quality management departments responsible for analyzing feedback data and formulating improvement measures. For example, by regularly analyzing recurring issues in patient feedback, hospitals can swiftly pinpoint weak areas in service processes and implement targeted optimization strategies. For patient complaints, hospitals must respond promptly and handle them appropriately to mitigate negative emotions and prevent escalation of conflicts. Resolving patient concerns in a timely manner not only enhances patient satisfaction but also fosters trust in the hospital. Hospitals can also set up a quick complaint handling mechanism to provide patients with a more efficient service experience and enhance their trust and loyalty to the hospital.

Hospitals can also incentivize patient feedback by introducing reward programs, such as offering tokens of appreciation for constructive suggestions. This approach encourages more patients to participate in feedback processes while fostering positive interactions between patients and the hospital, creating a virtuous cycle of service improvement. By implementing a comprehensive feedback mechanism, hospitals can continuously optimize service processes and improve quality, ultimately increasing patient satisfaction and loyalty. Hospitals can publish regular improvement reports to show patients what actions the hospital has taken based on feedback, thereby enhancing transparency and increasing patient engagement.

(6) Achieving digitalization in healthcare service management

Digitalized management is a critical tool for improving the quality and efficiency of healthcare services. With the widespread adoption of digital technologies in healthcare, private hospitals can leverage information systems to streamline management processes and

enhance patient experiences. For instance, establishing electronic health record (EHR) systems allows for the digital management of patient health data, enabling physicians to quickly access medical histories, test results, and treatment records. This information-driven approach significantly improves diagnostic efficiency and reduces medical risks arising from information asymmetry or recording errors.

EHR systems benefit not only healthcare providers but also empower patients with convenient health management tools. Patients can access their health records and treatment progress via mobile applications, promoting better awareness of their health status. This transparent health information management fosters trust in the hospital while minimizing misunderstandings during communication. Additionally, hospitals can optimize patient appointment processes through intelligent scheduling systems, allowing patients to select convenient appointment times and reducing waiting periods. During peak times, such systems effectively distribute patient traffic, improving hospital reception efficiency. Hospitals can also use this platform to provide patients with personalized health advice and reminders, such as regular physical examinations, vaccinations and other services, to enhance patient engagement and loyalty. In addition, the smart appointment system can recommend the most appropriate appointment time based on the patient's historical medical records, disease type and doctor's availability, further improving appointment efficiency and patient satisfaction.

Smart navigation systems represent another vital application of digitalized management. Patients can use features such as self-service registration, online payments, and real-time updates to streamline their medical visits. These systems alleviate the workload of hospital staff while offering patients a more convenient service experience. Through data sharing and real-time updates, hospitals can ensure that all patient information flows smoothly between different departments, reducing duplicate examinations and medical errors. By fully embracing digitalized healthcare service management, hospitals can significantly enhance operational efficiency, improve patient experiences, and strengthen their market competitiveness.

(7) Strengthening infection control and safety standards in the hospital

Stringent infection control and safety management are the cornerstones of high-quality healthcare services. In the highly competitive private hospital market, ensuring patient health and safety is critical to gaining patient trust. Hospitals should strictly adhere to standards set by the Ministry of Health and disease control authorities, implementing infection control measures such as hand hygiene protocols, environmental disinfection, isolation procedures, and sterile processing of medical equipment. These standardized management practices

effectively minimize the risk of hospital-acquired infections and ensure patient safety.

Healthcare professionals are the primary enforcers of infection control, necessitating regular professional training to keep them up to date on the latest infection control techniques and emergency response procedures. For example, in the event of fires, outbreaks, or other emergencies, medical staff must respond swiftly and implement effective measures to safeguard both patients and themselves. Additionally, hospitals must strengthen pharmaceutical management to ensure that the storage, distribution, and administration of medications comply with safety standards, thereby preventing medical errors related to drug use. Through simulated emergency drills, hospitals can ensure that medical staff can respond effectively in emergency situations and improve overall emergency response capabilities.

While elevating safety standards, hospitals can also foster patient trust through transparent safety management practices. Regularly sharing infection control statistics, pharmaceutical management reports, and updates on safety improvements with the public can significantly enhance patient confidence. This open and transparent approach to safety management not only assures patients of their security but also helps establish a hospital's reputation as a responsible and trustworthy healthcare provider. By regularly publishing safety improvement reports, hospitals can also demonstrate their commitment to continuous improvement and actual results to patients, further enhancing patient satisfaction and loyalty.

7.4.2 Shaping a positive brand image

The data analysis results of this study indicate that the brand image of private hospitals has a significant positive impact on brand equity. Therefore, shaping a positive brand image is a crucial pathway for private hospitals to enhance brand equity. A strong brand image not only increases patient trust but also creates a differentiating advantage in a competitive healthcare market. Building a positive brand image requires a systematic approach across multiple aspects, including brand professionalism, social responsibility, cultural development, communication style, environmental design, and public relations activities.

(1) Strengthening a professional brand image

The brand image of private hospitals is primarily rooted in their professionalism, which serves as a key factor influencing patient choice. Compared to public hospitals, private hospitals often attract patients with higher levels of medical expertise, personalized services, and superior healthcare environments. Demonstrating professional strength is thus a core strategy for enhancing brand image.

Hospitals can highlight their professionalism by showcasing the credentials and clinical

expertise of their medical teams. The caliber of the medical team is a direct indicator of hospital quality for patients. By presenting information such as specialists' academic backgrounds, certifications, clinical achievements, and successful case studies, hospitals can build patient trust in their technical capabilities. For instance, publishing details about key physicians' educational histories, research accomplishments, and treatment experiences on the hospital website, brochures, or media reports can significantly boost patient confidence through transparent information sharing.

Hospitals should focus on establishing strengths in specialized fields to create a competitive edge. A private hospital, for instance, might concentrate on areas like cardiology, oncology, or infertility treatment to develop a professionally authoritative brand image. Publishing medical journals, organizing academic seminars, and collaborating with renowned medical institutions are additional ways to reinforce credibility and professional recognition. Academic activities not only demonstrate research capabilities but also enhance the hospital's reputation and influence within the medical community.

Collaborating with academic institutions to develop new technologies is another key approach to strengthening a professional brand image. Hospitals can establish long-term partnerships with prestigious universities or research institutes to conduct cutting-edge medical research, such as developing new surgical techniques, treatment methods, or medical devices, and applying these advancements to clinical practice. This not only enhances the hospital's professionalism but also attracts patients seeking innovative medical care. Additionally, incorporating advanced medical equipment and technologies, such as high-precision imaging systems or artificial intelligence diagnostic tools, reinforces the hospital's modern and professional image in the minds of patients.

By employing a variety of strategies to enhance their professional brand image, private hospitals can establish themselves as trusted providers of high-quality medical services. This professional identity not only attracts more patients but also strengthens the hospital's core competitiveness in the healthcare market.

(2) Actively fulfilling social responsibility

Brand image is influenced not only by the level of medical expertise but also by a hospital's commitment to social responsibility. Patients are more likely to trust and recognize a hospital that demonstrates care for societal health and actively fulfills its public obligations. Thus, in strengthening brand image, private hospitals should focus on fostering goodwill through the practice of social responsibility.

Private hospitals can highlight their social responsibility by engaging in a variety of

public welfare activities. Examples include organizing free medical clinics to provide healthcare services to economically disadvantaged individuals, hosting health education seminars to disseminate knowledge within communities, or implementing health assistance programs to support underserved rural areas. These initiatives not only enhance the hospital's social image but also build emotional connections with the community, fostering a sense of belonging among patients and the public. Hospitals can also cooperate with local governments or non-governmental organizations to expand their influence in the field of social responsibility by holding large-scale charity events, thereby further deepening the brand's impression in the public's mind.

Hospitals can establish dedicated funds to support low-income patients or research on specific diseases. For instance, creating funds for cancer treatment or children's health can alleviate the financial burdens of economically disadvantaged patients. These measures not only directly benefit patients but also elevate the hospital's reputation through social recognition. Additionally, these funds can attract external resources and partnerships, further expanding the hospital's social impact.

Private hospitals play a critical role in responding to public health emergencies. For example, during the COVID-19 pandemic, many private hospitals demonstrated strong social responsibility by providing medical resources, donating protective equipment, and offering volunteer services. Such proactive actions not only aid society in crisis management but also highlight the hospital's commitment and contribution as a member of the community, enhancing public trust and goodwill.

Hospitals can collaborate with governments and social organizations to implement public welfare projects, achieving broader societal impact. Examples include partnering with the government on health assistance programs or collaborating with non-governmental organizations (NGOs) to deliver community health services. This cooperative approach amplifies the hospital's societal influence and creates a virtuous cycle between brand building and social responsibility. At the same time, hospitals should regularly evaluate the effectiveness of cooperation projects, ensure the actual impact of public welfare activities, and report their results to the public to further enhance the brand's social influence.

By actively fulfilling social responsibilities, private hospitals can cultivate a brand image characterized by warmth and accountability. This image not only garners patient trust and positive word-of-mouth but also enhances the hospital's competitiveness in the healthcare market, further solidifying its brand equity.

(3) Building Hospital Culture to Enhance Brand Identification

Hospital culture forms the core essence of brand image, influencing not only the attitudes of healthcare teams but also significantly enhancing patients' brand identity with the hospital. An excellent hospital culture should center around a "patient-centered" philosophy, emphasizing values such as respect, care, and dedication to patient service. By fostering a positive cultural atmosphere, hospitals can establish strong emotional connections between employees and patients, thereby increasing their sense of belonging and brand recognition.

The development of hospital culture should start with employees. Hospitals can facilitate this process through internal training, cultural campaigns, and workshops to help healthcare staff deeply understand the essence and values of hospital culture. Training content may include topics like understanding patients' psychological needs, service etiquette, and personalized care to ensure that employees integrate cultural values into their daily service behaviors. For example, hospitals could use case-based teaching to guide employees on maintaining patience and attentiveness during busy work schedules, thereby demonstrating respect and care for patients.

Regular team-building activities can further strengthen employees' sense of belonging and identification with the hospital. Activities such as outdoor team-building exercises, collaborative games, or cultural-themed events can enhance communication and cooperation among healthcare staff, fostering emotional attachment to the hospital. Employees with a strong sense of belonging are more likely to convey a positive brand image in their interactions, acting as proactive ambassadors of the hospital's cultural identity.

Leadership plays a pivotal role in shaping hospital culture. Leaders must embody the hospital's values through their actions, such as addressing patient needs, supporting staff development, and prioritizing patient-centered approaches during crisis management. These actions convey cultural principles to employees and inspire them to uphold the hospital's brand image through their work. For example, hospital directors or department heads could host regular meetings with patients to understand their needs while setting an example for employees to follow, making every healthcare professional a "spokesperson" for the hospital's brand.

By cultivating a patient-centered culture, private hospitals can strengthen both employee and patient identification with the brand, thereby reinforcing the core competitiveness of their brand image. This culture not only enhances the patient experience but also lays a foundation for building a stable and enduring brand asset.

(4) Developing high-quality communication with patients

High-quality doctor-patient communication is a vital component of shaping the hospital's

brand image and is a key driver of patient satisfaction and trust. Effective communication helps patients better understand their conditions, treatment plans, and prognoses, reducing unnecessary anxiety while increasing their appreciation of the hospital's services.

Private hospitals should focus on establishing robust communication mechanisms during consultations. Physicians and healthcare staff should demonstrate patience and empathy while interacting with patients, using simple and clear language to explain medical information and avoiding excessive technical jargon. This approach ensures patients can fully comprehend their conditions and treatment options. For complex or sensitive diagnoses, doctors should deliver information appropriately, considering the psychological responses of patients. For instance, explaining test results gradually can help patients build confidence in the treatment process. Hospitals can also provide written materials or multimedia resources to help patients better understand complex medical information, further improving communication effectiveness and patient engagement.

Hospitals can expand communication channels to enhance interaction with patients. Initiatives like patient hotlines and online consultation platforms enable patients to receive professional advice beyond their in-person visits. Using tools such as WhatsApp, email, or other instant messaging services, patients can conveniently ask about medication or recovery guidance. These readily accessible communication methods not only improve patient convenience but also foster satisfaction and trust in the hospital's services. By establishing a multi-platform interactive mechanism, the hospital can also provide patients with personalized consulting services, formulate more appropriate suggestions based on the patient's health conditions, and further enhance the patient's trust and loyalty.

Systematic communication skills training for healthcare staff is essential to improve their ability to engage with diverse patient groups. For instance, communication strategies should address the specific needs of elderly patients, children, or international patients. Training modules could include non-verbal communication techniques, active listening skills, and empathy development to help staff establish effective interactions even in complex situations.

Private hospitals can integrate patient feedback mechanisms into their communication systems to further enhance the quality of doctor-patient relationships. After treatments or discharge, hospitals could use surveys or follow-up calls to gauge patients' satisfaction with the communication process and continuously refine their approach based on feedback. This iterative improvement mechanism helps hospitals gradually enhance the quality of doctor-patient communication, providing stronger support for building a positive brand image.

(5) Focusing on hospital environment design and service details

The design of a hospital's environment is not only a crucial part of the patient experience but also a key factor in building its brand image. A comfortable, welcoming, and modernized healthcare setting can effectively ease patients' anxiety while enhancing their overall perception of and trust in the hospital.

Hospitals should design their facilities with patient needs in mind. For example, waiting areas can be made more inviting by incorporating natural light, installing bright lighting, and adding greenery. Quiet resting spaces and comfortable seating can alleviate the fatigue of waiting, creating a more pleasant experience for patients. Additionally, hospitals should consider accessibility in their designs, especially for elderly patients or those with mobility issues, by providing features such as handrails, elevators, and wide hallways to demonstrate attention to detail and care for all patients.

Hospitals can further enhance the patient experience by offering value-added services. For instance, waiting areas can provide complimentary refreshments, Wi-Fi, magazines, or televisions to make patients' waiting time more enjoyable and reflect the hospital's thoughtful service. For pediatric patients, hospitals can establish child-friendly zones or waiting areas with cartoon-themed decorations and toys to help alleviate their fear and anxiety. This family-friendly design not only earns the trust of parents but also strengthens the hospital's brand image.

Attention to detail in environment design is equally important. Hospitals should implement clear signage and wayfinding systems to help patients quickly locate their destination departments. Wall decor such as health education posters or profiles of renowned physicians can create a professional and caring atmosphere. Maintaining cleanliness and convenience in auxiliary facilities like restrooms and parking areas can also significantly improve patients' satisfaction with the hospital. These meticulous details in service design enhance the overall patient experience and contribute positively to the hospital's brand image.

(6) Enhancing brand communication and public relations activities

Brand communication and public relations are vital tools for private hospitals to increase brand awareness and shape their image. Through diversified communication channels and targeted public relations activities, hospitals can convey trustworthy and professional brand messages to the public, attracting more patients.

Private hospitals can leverage self-media platforms for brand promotion. For instance, using channels like WeChat or TikTok, hospitals can share diverse and engaging content such as health education articles, hospital updates, or profiles of exceptional medical teams,

enabling patients to gain a comprehensive understanding of the hospital's services and expertise. Regular posts, such as seasonal health tips (e.g., flu prevention, chronic disease management) or innovative treatment cases, can highlight the hospital's technical capabilities and service quality. This content marketing strategy increases public influence and fosters a positive brand perception among potential patients.

On mainstream media platforms, hospitals can reinforce their brand image by sharing patient success stories and positive reviews. Publishing testimonials, patient satisfaction scores, or the hospital's achievements in medical innovation showcases the hospital's strengths in professionalism and patient care. Additionally, inviting reputable media outlets to interview the hospital's expert teams about current medical topics or the hospital's specialized services can expand the brand's reach and societal influence.

Collaborations with brand ambassadors or public figures can also enhance the hospital's visibility. By partnering with reputable experts in the medical field or well-known individuals as brand advocates, hospitals can build credibility and extend their influence among target patient groups. For high-end medical services, such collaborations can attract more high-value patients and support the hospital's market expansion efforts.

Private hospitals should focus their brand communication on three core elements: professionalism, social responsibility, and compassionate care. Professionalism is the foundation of a private hospital's competitiveness, and showcasing its technical expertise and academic contributions builds patient trust in its services. Social responsibility, reflected through community engagement, health outreach, and proactive responses during public health crises, demonstrates the hospital's value to society. Compassionate care, conveyed through human-centered service narratives and authentic patient feedback, highlights the hospital's commitment to addressing patients' needs. This multidimensional approach to brand communication helps hospitals establish a distinct and appealing brand identity, attracting greater attention from potential patients.

(7) Offering diverse health education and outreach activities

Health education and awareness activities are essential strategies for hospitals to strengthen their brand image. These initiatives not only empower patients with health knowledge and management skills but also demonstrate the hospital's professional competence and social responsibility. Private hospitals can employ a variety of activity formats to build stronger connections with patients while increasing their influence in the community.

Hospitals can regularly organize offline health education events, such as health seminars,

free clinics, and disease prevention consultations. These activities provide patients with scientific health knowledge while showcasing the hospital's expertise. For instance, inviting renowned doctors or specialists to deliver lectures on common illnesses, such as diabetes or hypertension, can help patients master key aspects of disease management. Additionally, free clinics offering physical check-ups, health assessments, and personalized advice can foster closer ties between the hospital and the community, enhancing public recognition and trust.

Innovative formats, such as "Health Open Days," can further enhance patient engagement. During these events, community members can tour hospital facilities, including diagnostic equipment, laboratories, and inpatient wards, while attending brief health talks. This transparent and open approach reduces patients' unfamiliarity with the hospital environment, enhancing the hospital's brand affinity and professional image.

Online health education is another critical component of health awareness efforts. Through platforms like WeChat or TikTok, hospitals can regularly share health-related content, including disease prevention tips, daily care advice, and dietary recommendations. For instance, hospitals can produce a series of short educational videos answering frequently asked questions or presenting real-life cases to emphasize the importance of scientific treatment. This content marketing strategy not only fosters trust but also attracts potential patients, expanding the hospital's online presence. Through multi-platform communication, hospitals can extend health education to a wider audience and further enhance their visibility and influence in the public health field.

The ultimate goal of health education activities is to improve patients' ability to manage their health while reinforcing the hospital's "professional and caring" brand image. These initiatives not only help build trust among patients but also enhance the hospital's reputation and goodwill within the community, providing strong support for brand asset growth.

(8) Establishing transparent service standards and quality supervision mechanisms

Transparent service standards and comprehensive quality supervision mechanisms are fundamental to shaping the brand image of private hospitals. One of the primary expectations of patients is fairness and transparency, and clearly defined service processes and unbiased oversight systems can effectively alleviate patients' concerns, building their trust in the hospital.

Private hospitals should disclose service details and pricing structures, allowing patients to understand the costs of medical services clearly. Hospitals can prominently display fee schedules, including registration fees, diagnostic charges, and treatment costs, on their websites, service desks, or designated information boards within the hospital. This transparent

approach reduces uncertainty and reassures patients of the hospital's commitment to standardized and fair management practices.

Hospitals should establish scientific service protocols and clinical standards. From registration to consultation, diagnosis, and treatment, all processes should be designed with clarity and efficiency in mind. Tools such as guidance services and digital solutions (e.g., self-service kiosks and mobile apps) can further streamline the patient experience. These standardized procedures not only minimize patient confusion but also improve operational efficiency.

In terms of quality supervision, hospitals should create dedicated quality management departments responsible for regularly monitoring service performance and devising improvement plans. For example, by analyzing patient satisfaction surveys, service quality ratings, and internal audits, hospitals can identify areas for improvement and implement targeted solutions. Additionally, seeking patient input through suggestion boxes or online feedback platforms encourages a participatory approach to service enhancement. This two-way interaction helps hospitals quickly identify problems while making patients feel valued, further strengthening their loyalty.

Complaint resolution mechanisms are another crucial aspect of quality supervision. Hospitals should respond promptly to patient complaints and resolve them appropriately, utilizing clear procedures for handling and addressing grievances. Offering real-time updates on complaint progress and conducting follow-up calls to assess patient satisfaction with the resolution process can turn negative experiences into opportunities for positive service improvements.

By implementing transparent service standards and robust quality supervision mechanisms, hospitals can establish a brand image of fairness and reliability, further enhancing patient trust. This trust not only boosts patient satisfaction and loyalty but also helps the hospital build a sustainable competitive advantage in the market.

7.4.3 Enhancing brand awareness

The data analysis results of this study indicate that under high patient involvement, brand awareness in private hospitals has a significant positive impact on brand equity. Therefore, enhancing brand awareness is also an important aspect of improving brand equity in private hospitals. Brand awareness influences patient trust and choice and determines a hospital's appeal in a highly competitive healthcare market. Through diversified promotional tactics, in-depth brand marketing, partnerships, social media platforms, patient education, and an

integrated brand communication strategy, private hospitals can systematically boost brand awareness, attracting more potential patients and strengthening their market influence.

(1) Increasing brand exposure through online and offline promotion

Brand exposure is essential for increasing brand awareness. Private hospitals can combine online and offline promotional methods to maximize visibility. Online, hospitals can use platforms like official websites, WeChat, Weibo, and TikTok to promote brand-related content, such as health education, hospital news, expert interviews, and success stories. For instance, hospitals could launch an "Expert Q&A" column on WeChat, inviting authoritative doctors to address common health concerns, thereby capturing the attention of potential patients. Additionally, hospitals can create engaging health videos on platforms like TikTok to reach a broader audience.

Offline, hospitals can hold community health seminars, free health screenings, and awareness days to strengthen public familiarity with the hospital's brand. For example, hosting free health screenings in nearby communities can both raise brand awareness and allow potential patients to experience the hospital's services, fostering trust. Hospitals can also set up health consultation booths in public spaces or malls, offering free blood pressure or glucose checks to enhance brand friendliness.

(2) Highlighting core brand strengths to emphasize unique attributes

In the process of building brand awareness, private hospitals should focus on identifying and emphasizing their core strengths. Unlike public hospitals, private hospitals rely more on differentiated attributes to build brand awareness, such as premium services, specialization in certain fields, and personalized care. Hospitals can focus on promoting specific specialty departments or unique treatments to reinforce awareness of these distinctive services. For example, if a hospital excels in obstetrics or cardiovascular care, it could highlight its expert teams, successful cases, and advanced facilities in these areas, building brand strength and differentiation within target audiences and enhancing brand awareness.

(3) Establishing strategic partnerships with related medical institutions and companies

Private hospitals can enhance brand awareness through strategic collaborations with other healthcare institutions, companies, and community organizations. Partnering with well-known public hospitals, insurance companies, health management platforms, and health screening organizations allows hospitals to offer joint health check-ups, specialized medical services, and health management programs. These partnerships can strengthen brand credibility and broaden reach by associating the hospital with the partner's brand. Collaborations in the insurance and health management sectors are particularly beneficial, as patients may be

directed to the hospital through insurer or platform recommendations, increasing brand exposure.

Additionally, private hospitals can co-host public welfare events or health campaigns with reputable health-related companies, leveraging their resources to boost brand awareness. For instance, partnering with pharmaceutical or nutrition companies to host health seminars or free consultations can attract more potential patients, expand influence, and increase patient trust.

(4) Leveraging social media platforms for interaction and content marketing

Social media provides an effective channel for brand communication in private hospitals. Hospitals can use social media to share health education, hospital events, expert advice, and engage directly with patients. For instance, regular posts on platforms like Weibo and WeChat featuring health tips, prevention, and treatment information can help the public improve health awareness and foster trust in the hospital. Hospitals can also host online Q&A sessions, live consultations, and expert interviews on social media, enabling more potential patients to engage with the brand, increasing visibility and relatability.

Given the high activity on social media, hospitals can capitalize on this by creating health-themed online events or patient story submissions to encourage users to share hospital-related content, thereby generating secondary reach. Encouraging positive patient reviews on social media also strengthens the hospital's reputation online, boosting brand awareness.

(5) Strengthening patient education to enhance brand recognition

Patient education is a key approach to increasing brand awareness. Private hospitals can help patients increase health literacy and enhance brand recognition through health seminars, health screenings, and disease prevention campaigns. For example, regular offline health talks or online health courses covering common disease prevention and health management can improve patients' health knowledge while reinforcing the hospital's professional image. Hospitals can also share health articles and preventive guides on WeChat or their official website, allowing patients to better understand the hospital's expertise and service strengths.

Through patient education, hospitals not only deliver professional knowledge but also convey their brand values and philosophy. For patients with chronic illnesses, hospitals can offer ongoing health management services to provide continuous support, thereby strengthening these patients' recognition and acceptance of the hospital's brand.

(6) Implementing targeted brand communication strategies

A targeted brand communication strategy helps hospitals rapidly increase brand

awareness among their ideal audience. Private hospitals can use personalized communication based on patient needs and behavior characteristics, such as targeted ads on different media to effectively reach target demographics. For instance, hospitals can enhance the visibility of their official website through search engine optimization (SEO), ensuring that potential patients searching for specific conditions or treatments see the hospital's information first. Additionally, they can use health apps and platforms to deliver targeted ads, attracting potential patients with specific healthcare needs.

In brand communication, hospitals should ensure high-quality and consistent messaging to accurately convey the brand image. High-quality educational content, introductions to authoritative medical teams, and other assets help position the brand as professional and trustworthy. Real patient stories can also serve as valuable brand content, sharing authentic treatment cases and recovery experiences to enhance brand credibility and improve recognition among potential patients.

(7) Utilizing brand ambassadors

Collaborating with brand ambassadors or public figures can significantly enhance a hospital's brand awareness. Private hospitals may invite influential experts, doctors, or public figures in the health field to act as brand ambassadors or spokespersons, leveraging their professional influence to increase the hospital's visibility. For example, hospitals can invite authoritative experts to speak at public events or participate in professional forums to establish the hospital's reputation in specialized fields. Hospitals can also collaborate with well-known health bloggers or opinion leaders who can promote the hospital's services and health management philosophy through their platforms.

(8) Maintaining brand image and building positive reputation

While increasing brand awareness, private hospitals should also focus on maintaining their brand image and building a positive reputation. Hospitals can establish long-term relationships with patients, continuously improve service quality, and uphold a positive brand image. For instance, creating a patient service center to address patient concerns and feedback promptly ensures that each patient's experience meets expectations. Additionally, using patient review platforms to collect feedback and make improvements based on this input can enhance patient satisfaction. A strong reputation will further increase brand awareness and strengthen the hospital's market appeal.

7.4.4 Increasing brand loyalty

The data analysis results of this study indicate that brand loyalty in private hospitals has a

significant positive impact on brand equity. Therefore, increasing brand loyalty is essential for private hospitals to build stable, long-term brand equity. Brand loyalty not only helps hospitals secure their position in the market but also attracts new patients through sustained support and word-of-mouth, enabling sustainable brand growth. Private hospitals can enhance brand loyalty through personalized services, patient relationship management, brand culture development, feedback mechanisms, long-term follow-up programs, and patient education, laying a solid foundation for brand development.

(1) Providing personalized and customized healthcare services

Personalized and customized medical services are a significant advantage of private hospitals over public institutions and an effective way to enhance patient satisfaction and loyalty. Unlike traditional standardized service models, private hospitals can provide tailored medical solutions by understanding patients' individual health needs and differences, making them feel valued and cared for.

For chronic disease patients, hospitals can develop exclusive health management plans. These patients require ongoing monitoring and interventions, such as for diabetes or hypertension. By providing regular health assessments, data monitoring, and personalized interventions (e.g., dietary guidance, exercise plans), hospitals can help patients better manage their conditions. Such continuous services not only improve patients' health outcomes but also strengthen their reliance on and loyalty to the hospital. Hospitals can use telemedicine technology and smart health devices to provide real-time health monitoring and online consultation to further improve the accuracy and convenience of chronic disease management.

For high-end patients, private hospitals can offer VIP services or specialized care. For instance, VIP patients can benefit from expedited registration, dedicated diagnostic channels, and private wards, avoiding discomfort caused by complex processes or noisy environments. Additionally, hospitals can assign personal health managers to VIP patients, offering one-on-one health consultations and care services. These customized experiences make patients feel respected and convenience, increasing their trust in and recognition of the hospital brand.

Furthermore, personalized services can significantly impact special patient groups. For example, hospitals can provide pregnant women with tailored prenatal check-up plans and postpartum recovery guidance, design child-friendly consultation areas for pediatric patients, or offer mobility aids and customized health management plans for elderly patients. These services address practical needs while fostering emotional connections, thereby boosting patient satisfaction and loyalty. Hospitals can also combine mental health services to provide

emotional support and psychological counseling for special groups, ensuring that medical services cover both the physical and psychological needs of patients.

By offering personalized medical services, private hospitals can enhance patients' trust and reliance, encouraging them to choose the hospital as a long-term health management partner. This deep trust relationship not only increases patient loyalty but also attracts new patients through positive word-of-mouth, ultimately enhancing the hospital's brand equity.

(2) Establishing a comprehensive patient relationship management (PRM) system

A comprehensive patient relationship management (PRM) system is another critical measure for private hospitals to enhance patient loyalty. Through digital and intelligent management tools, hospitals can better manage patient information, optimize service processes, and improve patient experiences.

A PRM system can record detailed patient information, including medical history, previous diagnoses, health status, and personal preferences. This data provides healthcare providers with a complete basis for delivering tailored services while enabling hospitals to meet patient needs more precisely. For example, doctors can quickly develop suitable treatment plans by accessing patients' historical records, and nursing staff can deliver more attentive care by understanding individual preferences. This data-driven service model significantly improves patient satisfaction.

The PRM system also enables intelligent patient tracking, enhancing patients' sense of belonging through automated reminders and regular communication. For instance, hospitals can send greeting messages on patients' birthdays or significant holidays, fostering emotional connections. They can also remind patients about follow-up visits or health check-ups through SMS, email, or app notifications, ensuring timely health management. These thoughtful services demonstrate the hospital's care and attention, strengthening patient trust and loyalty.

The PRM system allows hospitals to optimize service strategies through data analysis. By analyzing patient feedback data, hospitals can identify service weaknesses, understand patient needs, and adjust service models accordingly. For example, if data reveals dissatisfaction with the registration process, hospitals can improve the system or increase guide services to enhance the experience. This data-driven improvement mechanism not only boosts service quality but also reinforces patient loyalty and trust.

Additionally, the PRM system helps hospitals build long-term patient service chains. By recording and analyzing health check-up data, hospitals can provide follow-up health recommendations and review plans, creating a comprehensive service loop from initial contact to ongoing care. This systematic and intelligent service model effectively enhances

patients' sense of belonging, positioning the hospital as a trusted health management partner.

(3) Cultivating hospital brand culture to establish an emotional bond

Brand culture reflects the intrinsic values of a hospital and serves as a fundamental basis for building brand loyalty. By fostering a "patient-centered" brand culture, private hospitals can integrate care and responsibility into their services, creating a sense of emotional connection and belonging among patients.

Hospitals can shape their brand image through well-defined cultural values. For instance, establishing "Patient Care and Quality First" as the core of their culture and disseminating this concept through internal training and promotional activities ensures every employee embodies these values. Regular brand culture training for medical staff can help them deeply understand patient needs and integrate these principles into their daily work. For example, during consultations and treatments, healthcare professionals can demonstrate care and responsibility by actively listening, communicating effectively, and providing meticulous service, allowing patients to experience the hospital's humanistic warmth.

Internal employee activities are a vital way to nurture brand culture. Team-building events, employee recognition programs, and cultural theme discussions can strengthen healthcare professionals' sense of belonging and alignment with the hospital's brand. When employees deeply identify with the hospital's culture, they are more likely to embody brand values in their daily interactions, creating a consistent internal and external brand image.

Hospitals can also reinforce the social responsibility aspect of their brand culture by participating in public welfare activities. Regular initiatives such as free clinics, health education seminars, or community health campaigns demonstrate the hospital's commitment to public health and its contribution to society. These efforts not only enhance patient recognition of the hospital's brand but also embed cultural values into public perception. For instance, a private hospital specializing in chronic disease management could conduct free health screening events, emphasizing its expertise and dedication in this area.

By embedding brand culture into services and social activities, private hospitals can establish deep emotional connections with patients. While receiving professional medical care, patients also experience the warmth and compassion inherent in the hospital's culture, leading to higher levels of brand loyalty.

(4) Strengthening patient feedback mechanisms for continuous service improvement

Patient feedback serves as a crucial tool for hospitals to assess service quality, identify areas for improvement, and build brand loyalty. By implementing efficient feedback mechanisms, private hospitals can gain precise insights into patient needs and adjust services

accordingly, enhancing patient satisfaction and loyalty.

Hospitals should establish diverse feedback channels to ensure patients can easily share their opinions and suggestions. This can include patient surveys, satisfaction evaluation forms, suggestion boxes, and online review platforms. In the digital age, hospitals can develop dedicated patient feedback systems, enabling patients to quickly submit evaluations via mobile applications or hospital WeChat accounts. These convenient channels not only increase patient participation but also provide hospitals with a wealth of authentic data.

A dedicated patient service department should be responsible for collecting, organizing, and analyzing feedback information. By conducting in-depth data analyses, hospitals can identify service issues and specific patient needs. For instance, if multiple patients highlight the complexity of registration processes or long wait times, hospitals can address these issues by installing self-service kiosks or optimizing triage workflows. The patient service department can also regularly release service improvement reports, showcasing actions taken based on feedback, thereby demonstrating the hospital's attentiveness and responsiveness.

Timely follow-up and response to patient suggestions are critical. Hospitals can inform patients about the status of their concerns and the corrective measures taken through callbacks or online messages. For example, if a patient files a complaint about adverse drug reactions, the hospital can promptly initiate an investigation with the relevant department and provide feedback within a short period. This rapid response alleviates dissatisfaction and builds patient trust and satisfaction.

Hospitals can establish a continuous improvement loop based on patient feedback. For instance, quarterly or annual patient satisfaction reports can track changes in service quality over time, ensuring consistent enhancement. Additionally, incentive programs can encourage healthcare staff to focus on patient feedback and actively improve services, fostering a culture of collective commitment to quality enhancement.

An effective patient feedback mechanism not only ensures service improvement but also serves as a long-term trust-building bridge with patients. By continuously optimizing services, hospitals can earn greater patient trust and support, creating a positive brand reputation and attracting more prospective patients to choose the hospital.

(5) Offering long-term follow-up and health management services

Long-term health follow-up and management services are crucial tools for private hospitals to establish enduring trust relationships with patients. For individuals with chronic conditions, post-surgical recovery needs, or those in high-risk groups, these services not only improve health management outcomes but also enhance patient loyalty to the hospital.

Hospitals can create dedicated health management teams to offer continuous health support to patients. These teams, composed of multidisciplinary professionals such as doctors, nurses, nutritionists, and counselors, conduct regular health follow-ups. For instance, for patients with diabetes or hypertension, the health management team can monitor blood sugar or blood pressure levels monthly and adjust health plans accordingly. This personalized follow-up service not only conveys the hospital's thoughtful care but also helps patients manage their conditions more effectively, thereby improving their quality of life.

Hospitals can use various methods to maintain long-term contact with patients and build strong trust relationships. For example, regular communication through phone calls, text messages, emails, or social media platforms can provide patients with health tips, medication reminders, and lifestyle advice. Such ongoing interactions help patients manage their health more effectively while fostering a sense of the hospital's consistent presence, enhancing reliance and loyalty. For example, a private hospital could utilize its WeChat public account to send personalized health reports periodically, allowing patients to track their health changes and receive tailored improvement suggestions.

For post-operative and rehabilitation patients, hospitals can follow up on their recovery progress and offer continued rehabilitation guidance. For instance, a personalized recovery exercise plan for patients undergoing knee surgery, combined with regular progress assessments, can significantly improve treatment outcomes. Simultaneously, these services highlight the hospital's professionalism and sense of responsibility.

The implementation of long-term follow-up and health management services not only enhances patients' health management capabilities but also helps establish the hospital as a caring and accountable brand. This enduring emotional connection fosters strong brand loyalty among patients and, through word-of-mouth, attracts more individuals to choose the hospital.

(6) Enhancing patient education to foster brand recognition

Patient education is a vital strategy for private hospitals to improve brand loyalty. By conducting scientifically sound health education activities, hospitals can help patients enhance their health management skills while increasing their recognition and trust in the hospital.

Hospitals can organize offline activities to disseminate health knowledge among patients. For instance, regular health seminars, disease prevention workshops, or rehabilitation guidance courses can educate patients on managing common conditions. For example, a cardiovascular specialist could lead a seminar for high-risk heart disease patients, offering insights on managing hypertension and heart conditions while addressing personalized

questions. Such face-to-face education allows patients to perceive the hospital's professionalism and genuine care more directly. Hospitals can increase patients' sense of participation through more interactive methods such as health salons and patient experience days, so that health education does not just remain at the level of information transmission, but becomes a health management process in which patients actively participate.

Leveraging online channels allows hospitals to expand the reach of their health education initiatives. Platforms such as WeChat, official websites, or TikTok can share health-related content, including disease prevention, health management, and emergency care tips, enabling patients to access professional health information anytime, anywhere. For instance, during flu season, hospitals could use social media to share prevention tips and vaccination guidelines, providing practical advice while enhancing their societal influence. Hospitals can use artificial intelligence technologies, such as smart health question-answering robots or online health consultation platforms, to provide personalized health education services so that patients can get accurate information and advice when they need it.

For long-term and high-risk patients, hospitals can offer more personalized health education services. For instance, diabetes patients could receive one-on-one nutrition counseling, or expectant mothers might benefit from online prenatal guidance or childbirth education. These tailored educational programs help patients better understand their health status and foster trust and reliance on hospital services. For example, a maternal and child health center could provide families with an online "Preparing for Delivery" course, demonstrating the hospital's expertise and commitment through comprehensive instruction.

Patient education not only improves individuals' health management capabilities but also subtly strengthens their sense of connection and loyalty to the hospital. This emotional bond is a key driver of brand loyalty. For instance, ongoing health education activities can lead patients to consistently associate positive experiences with the hospital, viewing it as a long-term health partner. Such loyalty not only enhances patient retention but also generates sustained market benefits and word-of-mouth promotion for the hospital.

(7) Enhancing doctor-patient communication to improve patient experience

Doctor-patient communication is a central element of the patient experience and a key lever for hospitals to enhance brand loyalty. High-quality communication not only alleviates patient anxiety but also increases trust and cooperation in the treatment process, ultimately boosting overall satisfaction with the healthcare experience.

Hospitals should incorporate communication skills training into the education of medical staff to help doctors and nurses improve their interactions with patients. When explaining

diagnoses, treatment plans, or potential risks, medical personnel should use simple and comprehensible language, avoiding excessive technical jargon to ensure patients can fully understand the information. For example, when explaining complex treatment plans, physicians can use analogies or visual aids such as diagrams to help patients grasp the rationale and expected outcomes. Such patient-centered communication fosters a sense of informed decision-making and safety, strengthening patient trust in the process.

Medical staff should exhibit patience and empathy when addressing patients' concerns. For instance, when patients express worry, staff can alleviate psychological stress through attentive listening and encouraging language while offering emotional support within their professional scope. This people-first approach not only helps patients feel the warmth and care of the hospital but also significantly enhances their satisfaction and loyalty.

Hospitals can establish patient consultation hotlines and online platforms to provide communication channels accessible at any time. For instance, after discharge, patients can consult their doctors about medication instructions or follow-up appointments via online platforms. These extended services improve convenience and foster a sense of security. Additionally, hospitals can use Q&A databases or intelligent customer service systems to address frequently asked questions, thereby improving communication efficiency and reducing waiting times for patients.

Effective doctor-patient communication mitigates patients' unfamiliarity with medical procedures and uncertainties, helping them better integrate into the treatment process. Through meticulous communication services, hospitals can not only optimize the patient experience but also build a trustworthy brand image in patients' minds, further enhancing brand loyalty.

(8) Using data analytics to provide personalized services

The application of data analysis technologies provides private hospitals with more scientific and efficient service methods. By deeply mining and analyzing patient data, hospitals can more precisely meet individual patient needs, thereby improving service quality and patient satisfaction.

Hospitals can leverage data analysis to comprehensively explore patient preferences and health needs. For example, by analyzing medical records, visit histories, and health data, hospitals can identify patients' primary health issues and potential risks to design personalized health management plans. For chronic disease patients, hospitals can utilize long-term monitoring data for blood pressure or glucose levels to develop more scientific treatment plans and lifestyle guidance. Such personalized services not only improve treatment outcomes

but also significantly enhance patients' trust in hospital services.

Hospitals can also tailor health advice and follow-up plans based on factors such as age, gender, medical history, and lifestyle habits. For instance, elderly patients might receive customized rehabilitation exercise plans, while younger patients could be offered health check-up packages or vaccination services. This data-driven, segmented management model effectively addresses diverse patient needs while improving service efficiency.

Data analysis can also enable hospitals to predict patient demands and optimize service workflows. By examining appointment records and peak visit times, hospitals can better allocate resources, such as scheduling physician shifts and optimizing clinic utilization, to reduce patient wait times. Real-time monitoring and analysis of patient feedback can also help hospitals quickly identify service shortcomings and adjust strategies to improve satisfaction.

The application of data analysis not only enables hospitals to deliver services more efficiently but also provides patients with a more precise and personalized experience. This data-driven service model enhances patient satisfaction and fosters loyalty by offering differentiated services tailored to individual needs.

7.4.5 Increasing patient involvement

The data analysis results of this study indicate that patient involvement in private hospitals plays a moderating role in the relationship between service quality, brand, and brand equity. Therefore, increasing patient involvement is a crucial strategy for enhancing brand equity in private hospitals. Patient involvement not only influences their identification with and loyalty to the hospital but also plays a key role in their decision-making and behavioral intentions. Through diverse interaction methods, customized health management services, online and offline engagement opportunities, personalized health education, social media use, and patient community building, private hospitals can effectively boost patient involvement, strengthening brand identification and dependence, and ultimately enhancing brand influence and market competitiveness.

(1) Providing diverse interaction methods

Private hospitals can offer a variety of interaction channels to increase patient engagement with the hospital brand. Options such as a 24-hour health hotline, online consultation platforms, and WeChat patient service accounts make it easy for patients to interact with the hospital anytime. Hospitals can also conduct regular surveys, inviting feedback on service quality, environment, and medical standards, then use this feedback to optimize services. These interactions make patients feel valued and help hospitals understand patients' genuine

needs, increasing involvement.

Furthermore, hospitals can establish a Q&A section where patients can share health questions online, and the medical team provides timely responses. This approach increases patient engagement and strengthens recognition of the hospital's expertise, boosting involvement.

(2) Offering personalized health management services

Personalized health management services are an effective means of increasing patient involvement. Private hospitals can create tailored health management plans based on individual needs, such as regular follow-up reminders, health monitoring, dietary guidance, and exercise recommendations. For chronic patients, long-term health management services with dedicated healthcare professionals can help establish self-care habits. Hospitals can also utilize smart health devices, such as wearable technology, to monitor patients' health in real-time and offer targeted advice, allowing patients to feel supported in their daily lives. Hospitals can also develop exclusive health management apps to allow patients to check their health data at any time, receive personalized health guidance, and maintain real-time interaction with medical staff, further enhancing patients' sense of participation and belonging.

Personalized health management not only increases patient involvement but also reinforces trust in the hospital, making patients more likely to rely on hospital-provided services and strengthening brand loyalty.

(3) Increasing online and offline engagement opportunities

Expanding opportunities for both online and offline engagement can significantly enhance patient involvement. Hospitals can host regular health seminars, disease prevention talks, and free health screening events, allowing patients to interact with the hospital's medical team face-to-face, learn about available services, and understand the hospital's brand values. For online engagement, hospitals can leverage social media and health apps to provide health education live streams, online seminars, and interactive activities. For example, hospitals can invite well-known experts to offer online consultations or conduct specialized health lectures, helping patients gain knowledge while increasing their sense of involvement.

Additionally, private hospitals can encourage patients to participate in brand promotion activities, such as sharing their treatment experiences or joining patient satisfaction programs, motivating patients to engage actively in building the hospital's brand. By offering diverse online and offline participation opportunities, hospitals can strengthen patient involvement and foster a positive brand experience.

(4) Implementing personalized health education programs

Health education plays a crucial role in increasing patient involvement. Private hospitals can tailor educational content based on patients' health status, age group, and lifestyle. For instance, chronic patients can receive disease management guides to better understand their condition and manage their health; younger patients can benefit from exercise and nutrition guides to improve health awareness; and older patients can learn prevention and care practices for common illnesses. Hospitals can deliver personalized health education through offline seminars, regular health guide distributions, or designated patient education areas, helping patients deepen their brand affiliation as they learn.

Additionally, hospitals can use WeChat, official websites, and health apps to deliver personalized health content, sharing targeted health guidance based on individual needs. This approach not only boosts patient involvement but also enhances the hospital's professional image among patients.

(5) Promoting interaction via social media platforms

Social media is an effective channel for private hospitals to increase patient involvement. Hospitals can create official accounts on social media to share medical service information, health knowledge, and expert insights, interacting regularly with patients. For example, on platforms like WeChat and Weibo, hospitals can host themed events, inviting patients to share health tips or treatment experiences and increasing interaction through comments, likes, and shares. Hospitals could also launch a "Health Check-in" campaign on WeChat, encouraging patients to share their healthy habits or recovery stories, with a reward mechanism to motivate broader participation and boost involvement. Hospitals can also conduct personalized online health lectures or live Q&A sessions based on patients' interests and needs to further enhance the interactivity of social platforms and patients' sense of participation.

Social media interaction also allows patients to express needs and opinions in a more relaxed setting. Engaging with patients on social platforms enhances their brand recognition and establishes a friendly image for the hospital, fostering greater trust in its services.

(6) Building patient communities to enhance brand affiliation

Patient communities can foster long-term connections between hospitals and patients. Private hospitals can create patient communities tailored to specific conditions and needs, such as diabetes management groups, hypertension management groups, or rehabilitation support groups. Healthcare staff can provide regular health consultations and share disease management knowledge in these communities, while organizing online and offline activities. Patients in these communities can share experiences and provide mutual support, enhancing

their sense of belonging and identification with the hospital. Through these communities, hospitals can gain insights into patient needs and feedback, enabling them to deliver more targeted services.

Patient communities also serve as "peer support" networks, where interactions among patients help them better adapt to and manage their conditions, thereby increasing their reliance on the hospital and enhancing patient involvement.

(7) Implementing a patient experience optimization program to increase engagement

A patient experience optimization program is an effective way to engage patients actively in hospital brand-building. Hospitals can regularly invite patients to provide feedback for experience enhancement or establish a patient advisory committee, allowing patients to participate directly in service improvement processes. Through such programs, patients can communicate their needs and suggestions directly to the hospital, contributing ideas for service optimization. This participation not only enhances patients' recognition and trust in the hospital but also boosts their involvement with the brand, thereby increasing the hospital's overall brand impact.

(8) Creating online surveys and satisfaction assessments

Online surveys and satisfaction assessments are convenient methods to increase patient involvement. Hospitals can periodically release online questionnaires, inviting patients to evaluate their treatment experience, service quality, and facility environment, and then refine services based on the results. For example, surveys can cover aspects such as the treatment process, healthcare staff attitudes, and the clinical environment. Patients who complete surveys could receive small gifts or discounts on health check-ups. This approach encourages patients to engage in the hospital's improvement efforts, allowing them to feel valued and increasing their involvement with the brand.

7.5 Research limitations and prospects

While this study offers a systematic analysis of strategies to enhance brand equity in private hospitals and proposes relevant management strategies, certain limitations remain that may affect the generalizability and interpretability of the results.

First, sample data limitations.

The data in this study are primarily drawn from patients in private hospitals within a specific region, which introduces geographical limitations. This may limit the applicability of the results to other regions. Patients' perceptions, needs, and preferences for private hospital

brands may differ across regions, especially due to variations in economic levels and healthcare accessibility, which may influence the importance placed on service quality, brand image, brand awareness, and related factors. Future research should consider collecting data from a broader geographic range to increase sample diversity and improve the generalizability of the findings. Additionally, while this study includes a sample size of 710 participants, which is relatively representative in social science research, it cannot entirely eliminate the potential impact of individual differences on data analysis. Thus, future research could incorporate longitudinal study designs to further validate the robustness of the findings.

Second, complexity of patient involvement as a moderating variable.

Although this study identifies patient involvement as a moderating variable and confirms its moderating effect on the relationships between medical service quality, brand image, brand awareness, brand loyalty, and brand equity, patient involvement itself is a complex concept. Its meaning may vary depending on individual differences. Different patients may exhibit varying levels of involvement influenced by personal health awareness, the severity of their condition, and their medical knowledge. Future research could delve deeper into the multi-level and multi-dimensional nature of patient involvement, distinguishing between behavioral, emotional, and cognitive involvement to better understand the nuanced role of these subdimensions in influencing brand equity.

Third, limitations of data collection methods

The data for this study were primarily collected through self-reported questionnaires, which, despite being based on well-established measurement scales and undergoing a pilot study to verify their reliability and validity, are still subject to social desirability bias and subjective reporting errors. The reliance on self-reported data may introduce certain biases that could affect the accuracy of the results. Future research could combine quantitative and qualitative methods, such as in-depth interviews, case studies, or experimental studies, to obtain a more comprehensive understanding of the research topic.

Based on the limitations above, future research could enhance and expand upon this study in the following areas:

First, expanding sample coverage.

Future studies could collect data from private hospitals across diverse regions, scales, and service levels to understand how perceptions of brand equity differ under various contextual backgrounds, thereby improving the generalizability of the findings. Additionally, cross-national comparative studies could be considered to analyze how private hospital brand equity is influenced by different national healthcare systems and cultural contexts, further

enhancing the generalizability of the research conclusions.

Second, refining the measurement dimensions of patient involvement.

Future research could segment patient involvement into specific dimensions, such as behavioral, emotional, and cognitive involvement, to explore their differentiated moderating effects on brand equity more precisely. This approach would allow for a more accurate understanding of the mechanisms by which patient involvement impacts brand equity.

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Annex A: Questionnaire of Research on the Impact of Private Hospital Medical Service Quality and Brand on Brand Equity

Dear Sir/Madam,

Greetings! Thank you for participating in our study on the quality of medical services, brand, and patient engagement at private hospitals. This questionnaire is designed to assess the performance of private hospitals in delivering medical services by gaining a detailed understanding of your experiences. Our research team evaluates the quality of medical services based on five dimensions: tangibility, reliability, responsiveness, assurance, and empathy. Additionally, we explore the impact of brand image and brand awareness on brand equity, and consider the role of patient engagement.

Completing this questionnaire will take approximately 10 to 15 minutes. Please answer the following questions based on your actual feelings and experiences. All data collected will be used solely for academic research, and we will maintain strict confidentiality of your personal information.

Thank you once again for your valuable time and support!

Section I: Basic Information

Gender:

☐ Male

☐ Female

Age:

☐ 18-25 years

☐ 26-35 years

☐ 36-45 years

☐ Over 46 years

Educational Background:

☐ College degree or below

☐ Bachelor's degree

☐ Master's degree or higher

Marital Status:

☐ Single

☐ Married

☐ Divorced

☐ Widowed

Monthly Income:

☐ Less than 3,000 CNY

☐ 3,001-5,000 CNY

☐ 5,001-10,000 CNY

☐ More than 10,001 CNY

Medical Expenses Payment Method:

☐ Social medical insurance

☐ Commercial insurance

☐ Out-of-pocket

☐ Other

Section II:

(1) Service Quality Scale

(Please evaluate the following statements based on your experience: 1 = Strongly Disagree, 5 = Strongly Agree)

Dimensions	Measurement Item	1	2	3	4	5
Tangible	Private hospitals are equipped with modern medical facilities.					
	The exterior environment of private hospitals is appealing.					
	The attire and appearance of the staff in private hospitals are neat and tidy.					
	Private hospitals clearly mark their facilities and service processes.					
Reliability	Private hospitals fulfill their commitments to patients punctually.					
	Staffs at private hospitals are enthusiastic about resolving patients' issues.					
	Private hospitals provide meticulous and correct services at a patient's first visit.					
	Private hospitals deliver services on time as expected.					
	Private hospitals accurately record patients' medical information.					
Responsiveness	Staffs at private hospitals proactively inform patients about service					

	and treatment processes and timelines.					
	Private hospital staff offer immediate and appropriate service.					
	Private hospital staff are willing to assist patients.					
	Private hospital staff do not neglect to answer patients' questions due to being too busy.					
Assurance	The conduct of private hospital staff influences patients' confidence in the services.					
	Patients feel safe during their visits.					
	Staffs at private hospitals are courteous and friendly.					
	Private hospital staff possess sufficient knowledge to answer patients' inquiries.					
Empathy	Private hospital staff give individual attention to different patients.					
	The outpatient hours at private hospitals meet the needs of patients.					
	Private hospitals have staff who care about individual patients.					
	Private hospitals prioritize the interests of their patients.					
	Staffs at private hospitals have a clear understanding of patients' special needs.					

(2) Brand Scale

(Please evaluate the following statements based on your experience: 1 = Strongly Disagree, 5 = Strongly Agree)

Dimensions	Measurement Item	1	2	3	4	5
Brand Awareness	Private hospitals are very famous					
	I am familiar with private hospitals					
	The characteristics of private hospitals are very obvious					
	I am familiar with the signs or symbols of private hospitals					
Brand Image	Private hospitals excel in treatment technology					
	Doctors in private hospitals are well-known					
	I believe this hospital has an excellent reputation in the healthcare industry.					
Brand loyalty	I consider myself loyal to this private hospital.					
	This private hospital would be my first choice.					
	Given the option to seek treatment at this private hospital, I would not consider other brands					

(3) Patient Involvement Scale

(Please evaluate the following statements based on your experience: the scale from 1 to 5 is explained in the rightmost column as follows)

This matter is ... to me						
Unimportant	1	2	3	4	5	Important
Uninteresting	1	2	3	4	5	Interesting
Irrelevant	1	2	3	4	5	Relevant
Unexciting	1	2	3	4	5	Exciting
Meaningless	1	2	3	4	5	Meaningful
Unattractive	1	2	3	4	5	Attractive
Unattractive	1	2	3	4	5	Engaging
Worthless	1	2	3	4	5	Valuable
Uninvolved	1	2	3	4	5	Engaging
Unnecessary	1	2	3	4	5	Needed

(4) Brand Equity Scale

(Please evaluate the following statements based on your experience: 1 = Strongly Disagree, 5 = Strongly Agree)

Dimensions	Measurement Item	1	2	3	4	5
Brand friendliness	I consider this brand as my friend					
	I like to associate with this brand					
	I feel that I will suffer a loss by leaving this brand					
	Association with this brand enhances my confidence					
Emotionality	I like this brand very much					
	I can feel this brand whenever I use it					
	Whenever I go to the hospital, I think of my favorite brand					
	I like to see the brand advertisement of this hospital					
Brand trust	The quality of the brand is consistent					
	The credibility of the brand is very high					
	For different hospitals, I prefer to use this hospital brand					
Alignment with brand personality	I am able to express myself with this brand					
	The characteristics of the brand match my personality traits					
	Using the brand gives me the identity I want					
	This brand represents my social class					

Thank you very much for taking the time to complete this questionnaire! Your feedback is extremely valuable to our research. Your information will be kept strictly confidential and used solely for academic research purposes. Once again, thank you for your participation and valuable input!

Annex B: The Reliability and Validity Analysis

Table b.1 KMO and Bartlett's sphericity test for service quality

Kaiser-Meyer-Olkin		0.794
Bartlett's sphericity test	Chi-square	365.167
	Df	239
	Sig.	0.000

Table b.2 KMO and Bartlett's sphericity test for brand image

Kaiser-Meyer-Olkin		0.813
Bartlett's sphericity test	Chi-square	756.425
	Df	402
	Sig.	0.000

Table b.3 KMO and Bartlett's sphericity test for brand awareness

Kaiser-Meyer-Olkin		0.754
Bartlett's sphericity test	Chi-square	417.351
	Df	315
	Sig.	0.000

Table b.4 KMO and Bartlett's sphericity test for brand awareness

Kaiser-Meyer-Olkin		0.828
Bartlett's sphericity test	Chi-square	792.385
	Df	393
	Sig.	0.000

Table b.5 KMO and Bartlett's sphericity test for patient involvement

Kaiser-Meyer-Olkin		0.763
Bartlett's sphericity test	Chi-square	312.245
	Df	216
	Sig.	0.000

Table b.6 KMO and Bartlett's sphericity test for Brand equity

Kaiser-Meyer-Olkin		0.824
Bartlett's sphericity test	Chi-square	751.254
	Df	273
	Sig.	0.000

Table b.7 Explanation of total variance of service quality

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotational sums of squared loadings		
	Total	% of variance	Cumul-ative %	Total	% of variance	Cumul-ative %	Total	% of variance	Cumul-ative %
1	6.148	27.95%	27.95%	6.148	27.95%	27.95%	6.031	27.41%	27.41%
2	4.259	19.36%	47.30%	4.259	19.36%	47.30%	4.261	19.37%	46.78%
3	3.156	14.35%	61.65%	3.156	14.35%	61.65%	3.217	14.62%	61.40%
4	2.473	11.24%	72.89%	2.473	11.24%	72.89%	2.515	11.43%	72.84%
5	1.214	5.52%	78.41%	1.214	5.52%	78.41%	1.226	5.57%	78.41%

Extraction method: Principal Component Analysis

Table b.8 Service quality factor loading table

Question items	Component 1	Component 2	Component 3	Component 4	Component 5
1			0.688		
2			0.821		
3			0.825		
4			0.708		
5	0.862				
6	0.798				
7	0.806				
8	0.804				
9	0.815				
10				0.823	
11				0.809	
12				0.841	
13				0.853	
14					0.764
15					0.830
16					0.657
17					0.831
18		0.712			
19		0.895			
20		0.715			
21		0.721			
22		0.833			

Extraction method: Principal Component Analysis
Rotation method: A quarter rotation method with Kaiser Standardization.
a. The rotation converges after 5 iterations.

Table b.9 Explanation of total variance of brand image

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	3.162	79.05%	79.05%	3.162	79.05%	79.05%

Extraction method: Principal Component Analysis

Table b.10 Brand image factor loading table

Question items	Component 1
1	0.828
2	0.801
3	0.783
4	0.845

Table b.11 Explanation of total variance of brand awareness

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	2.347	78.23%	78.23%	2.347	78.23%	78.23%

Extraction method: Principal Component Analysis

Table b.12 Brand awareness factor loading table

Question items	Component 1
1	0.818
2	0.896
3	0.791

Table b.13 Explanation of total variance of brand loyalty

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	2.162	72.07%	72.07%	2.162	72.07%	72.07%

Extraction method: Principal Component Analysis

Table b.14 Brand loyalty factor loading table

Question items	Component 1
1	0.717
2	0.627
3	0.722

Table b.15 Explanation of total variance of patient involvement

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	7.169	71.69%	71.69%	7.169	71.69%	71.69%

Extraction method: Principal Component Analysis

Table b.16 Patient involvement factor loading table

Question items	Component 1
1	0.715
2	0.683
3	0.794
4	0.738
5	0.742
6	0.697
7	0.782
8	0.731
9	0.688
10	0.741

Table b.17 Explanation of total variance of brand equity

Co-mponent	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotational sums of squared loadings		
	Total	% of variance	Cumul-ative %	Total	% of variance	Cumul-ative %	Total	% of variance	Cumulati-ve %
1	4.258	28.39%	28.39%	4.258	28.39%	28.39%	4.159	27.73%	27.73%
2	3.316	22.11%	50.49%	3.316	22.11%	50.49%	3.327	22.18%	49.91%
3	1.987	13.25%	63.74%	1.987	13.25%	63.74%	2.051	13.67%	63.58%
4	1.312	8.75%	72.49%	1.312	8.75%	72.49%	1.336	8.91%	72.49%

Extraction method: Principal Component Analysis

Table b.18 Brand equity factor loading table

Question items	Component 1	Component 2	Component 3	Component 4
1	0.683			
2	0.715			
3	0.621			
4	0.648			
5		0.732		
6		0.731		
7		0.811		
8		0.823		
9				0.628
10				0.663
11				0.617

12		0.702
13	0.797	
14	0.748	
15	0.820	

Extraction method: Principal Component Analysis

Rotation method: A quarter rotation method with Kaiser Standardization.

a. The rotation converges after 4 iterations.