

**MINISTRY OF EDUCATION AND TRAINING
NATIONAL ECONOMICS UNIVERSITY**



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**THE IMPACT OF SENSORY EXPERIENCES
ON PERCEIVED SERVICE QUALITY
AND CUSTOMER SATISFACTION:
STUDY IN VIETNAM'S HEALTHCARE SYSTEM**

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Supervisor: DR. NGUYEN THU LAN

Reviewers:

- 1: Assoc.Prof.Dr. Le Thi Thu Thuy**
- 2: Assoc.Prof.Dr. Tran Thi Bich Hanh**
- 3: Dr. Truong Tuan Anh**

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INTRODUCTION

1.1. Rationale of the research

The Vietnamese healthcare system is undergoing a pivotal transformation, fundamentally driven by the 2023 Law on Medical Examination and Treatment and the nation's ambitious goal of achieving a 90% patient satisfaction rate with public hospitals by 2030. This legislative and strategic shift marks a definitive transition from a traditional quantity-focused, subsidized system to a quality-oriented, patient-centered model. However, the contemporary healthcare landscape is heavily defined by profound paradoxes and competitive pressures. In the public sector, severe overcrowding at central and provincial hospitals, which accommodate up to 60% of the nation's patients and frequently operate at over 200% capacity, has led to a significant degradation of the physical environment, resulting in noise pollution, a lack of privacy, and highly stressful waiting areas. Conversely, the rapidly emerging private healthcare sector, which now accounts for approximately one-third of all outpatient services, is aggressively reshaping market expectations by offering premium, hotel-like service experiences that emphasize comfort and sensory amenities.

Driven by this institutional differentiation and the rising financial capacity of the middle class, Vietnamese patients have evolved into sophisticated consumers. Their provider selections are no longer dictated merely by proximity or basic necessity, instead, they critically evaluate multidimensional aspects of the care environment, from facility aesthetics to staff interactions. In this dynamic context, hospital administrators face a critical managerial dilemma: does investing in the upgrading of the physical servicescape, such as optimizing lighting, controlling noise, or curating pleasant ambient scents, yield a justifiable return on investment through enhanced patient satisfaction and loyalty, or are these merely superficial, wasteful expenses?

To address this practical problem, it is imperative to examine healthcare services through the theoretical lens of service marketing rather than the traditional biomedical model, which erroneously assumes patients are purely rational agents seeking only clinical cures. Healthcare is inherently a high-stress credence service characterized by severe information asymmetry. Patients typically lack the specialized medical expertise required to objectively judge the technical precision of a diagnostic procedure or surgical outcome. Consequently, according to signaling theory, patients unconsciously rely on the tangible signals emitted by the surrounding physical environment, such as cleanliness, acoustic control, and spatial harmony, as proxies to infer the unobservable professional competence and safety of the healthcare facility.

This information asymmetry provides the precise condition for sensory experiences to exert their potential. To avoid conceptual confusion, this study adopts the framework of Wiedmann et al. (2018), which posits that sensory experiences are not merely the objective environmental stimuli orchestrated by businesses, but rather the internal, subjective evaluative outcomes formed within the patients' subconscious minds when exposed to visual, auditory, olfactory, gustatory, and tactile cues. The pervasive psychological mechanism governing this process is best explained through the Stimulus-Organism-Response (S-O-R) paradigm. The multisensory hospital environment (stimulus) does not directly generate immediate satisfaction. Instead, it serves as the essential prerequisite for patients to decode these cues and construct their perceived service quality (organism). Subsequently, grounded in the expectation-disconfirmation paradigm, it is only when this perceived quality meets or exceeds prior expectations that it is translated into the final affective and behavioral outcome: customer satisfaction (response).

Crucially, this psychological transformation from sensory stimulus to qualitative perception does not occur uniformly, it is deeply governed

and moderated by socioeconomic and institutional boundaries. For instance, increasing financial capacity drives higher-income patients to demand sophisticated, multi-sensory care experiences rather than just basic clinical utility. Furthermore, the coexistence of two distinct healthcare delivery models creates completely opposing acceptance thresholds: patients may pragmatically tolerate noise and crowds in public hospitals as an inevitable trade-off for accessing top-tier clinical expertise, yet they apply an uncompromising, hospitality-based frame of reference when evaluating private facilities.

Despite the clear importance of the servicescape, the application of sensory experiences within the Vietnamese healthcare context reveals critical literature gaps: *First*, there is a lack of a comprehensive, empirically validated framework that simultaneously structures all five senses in a healthcare setting. Previous studies have largely adopted a fragmented approach, failing to systematically integrate the complete S-O-R framework to demonstrate that perceived service quality is the crucial mediating mechanism bridging sensory inputs and final satisfaction. *Second*, a gap exists regarding boundary conditions. No prior studies have adequately clarified the moderating roles of patient income and hospital type (public/private) in altering the intensity of sensory sensitivity and subsequent quality perceptions. *Third*, existing research often lacks rigorous control variables, such as gender, which are necessary to isolate the true impact of the S-O-R mechanism and prevent the misjudgment of sensory effects.

Consequently, decoding the psychological mechanisms behind sensory signals fills significant theoretical voids in service marketing within high-credence environments. Practically, it provides robust scientific evidence to assist policymakers and hospital administrators in optimizing infrastructure budgets and shifting from a purely curative approach to a holistic, care-centric model. Thus, this dissertation is initiated with the topic: *The impact of sensory experiences on perceived service quality and customer satisfaction: A study in Vietnam's healthcare system.*

1.2. Research objectives and questions

Research objectives

- To systematize the theoretical framework regarding the relationship between sensory marketing, sensory experiences, perceived service quality, and customer satisfaction in the healthcare context;
- To empirically evaluate the impact of five sensory experience factors (sight, sound, smell, touch, and taste) on perceived service quality and customer satisfaction through a large-scale survey of patients at healthcare facilities in Vietnam;
- To examine the mediating role of perceived service quality in the relationship between sensory experiences and customer satisfaction;
- To examine the moderating roles of income level and hospital type in the relationship between sensory experiences and perceived service quality, determining whether sensory sensitivity varies across different patient segments and facility types;
- To examine the control effects of gender on perceived service quality and customer satisfaction, thereby improving the robustness of the proposed research model.

Research questions

- How can the theoretical framework explain the relationship between sensory marketing, sensory experiences, perceived service quality, and customer satisfaction be systematized in the healthcare context?
- How do the five sensory experience dimensions affect patients' perceived service quality and customer satisfaction in Vietnamese hospitals?
- Does perceived service quality mediate the relationship between sensory experiences and customer satisfaction?

- Do income level of patients and the hospital type (public/private) moderate the relationship between sensory experiences and perceived service quality?

- Does gender have control effects on patients' perceived service quality and customer satisfaction?

1.3. Subject and scope of the research

The study specifically targets patients visiting hospitals for routine medical examinations, treatments of newly diagnosed conditions, or management of chronic diseases. It explicitly excludes patients in emergency situations or those with terminal illnesses, as these patients prioritize survival and clinical efficacy, significantly diminishing their cognitive capacity to process sensory stimuli. Spatially, the empirical survey encompasses healthcare institutions across the Northern, Central, and Southern regions of Vietnam. Temporally, the primary cross-sectional data collection was conducted from September 2025 to April 2026.

Distinguishing itself from traditional medical research that prioritizes clinical outcomes, this dissertation adopts a customer-centric service marketing approach. It focuses specifically on functional quality (the how of service delivery) rather than technical quality (the what) (Grönroos, 1984). Because patients lack the expertise to evaluate medical precision (Donabedian, 1988), the study approaches the hospital as a servicescape, a holistic sensory environment where service is produced and consumed simultaneously (Bitner, 1992; Parasuraman et al., 1988; Brady & Cronin, 2001). By adopting this perspective, the dissertation shifts the evaluative criteria from curing to caring.

1.4. Significance of the study

1.4.1. Theoretical contributions

Pioneering the application of sensory marketing in healthcare: expands the theory of sensory experiences in Vietnam's healthcare

context, approaching the hospital as a multi-sensory servicescape where patients use tangible sensory signals to infer overall service quality under conditions of high information asymmetry.

Holistic measurement of the five senses: the study develops and tests a research framework that integrates all five sensory experiences (sight, hearing, smell, taste, and touch) simultaneously as precursors to perceived service quality, rather than examining isolated senses.

Clarifying the mediating mechanism: based on the S-O-R framework, the research clarifies the mechanism linking sensory experience and customer satisfaction by demonstrating that perceived service quality acts as a crucial mediating variable.

Expanding boundary conditions and model robustness: expands the theoretical model by introducing income and types of hospital as moderating variables to assess varying sensory sensitivities across different patient segments and contexts. Furthermore, it enhances the model's robustness by incorporating gender as a control variable to identify underlying demographic differences in patients' evaluations.

1.7.2. Practical implications

Optimizing investment in the servicescape: The findings provide a scientific and practical basis for policymakers and hospital managers to identify priority factors when designing, renovating, and upgrading the service environment, helping to avoid spreading resources thinly.

Personalizing the patient experience: by confirming the moderating roles of income and types of hospital, the study provides a practical foundation for hospitals to adjust their experience design strategies to suit different patient groups and service delivery contexts.

Patient-centered management: provides a practical foundation for developing patient-centered healthcare service management strategies based on sensory experiences and the realities of the Vietnamese hospital system.

CHAPTER 2. THEORETICAL BACKGROUND AND LITERATURE REVIEW

2.1. Sensory marketing and sensory experiences in services

The evolution of marketing models has definitively transitioned from the product-centric focus of mass marketing (goods logic) to relationship marketing (service logic), and most recently to sensory marketing, which is strictly grounded in experience logic. Unlike traditional marketing that relies heavily on conscious cognitive processing, sensory marketing deliberately engages the customers' subconscious minds through the five human senses. It transcends traditional communication to create a brand with a soul (Lindstrom, 2005) and utilizes subconscious triggers to shape abstract concepts like quality without relying on explicit corporate claims (Krishna, 2012).

Crucially, to ensure measurement validity, this study rigorously distinguishes between three conceptual layers: sensory marketing (the managerial strategy), sensory stimuli (the objective physical cues), and sensory experiences (the internal, subjective evaluative outcomes) (Wiedmann et al., 2018). In the high-credence healthcare context, sensory experiences function as a critical interpretive mechanism through which patients decode these physical and psychological cues to evaluate perceived service quality under conditions of severe information asymmetry (Ugolini et al., 2014)

Drawing on the theoretical synthesis of Lindstrom (2005), Hultén et al. (2009), and Krishna (2012), the five human senses are reconceptualized as active perceptual modalities:

Visual experience plays a dominant role in establishing spatial context and capturing initial attention through aesthetic and design cues, helping patients navigate space and reduce feelings of uncertainty.

Auditory experience acts as a mood navigator; it extends beyond passive hearing to regulate psychological states (e.g., relaxation or anxiety) and shape temporal perception.

Olfactory experience functions as the most primal sensory channel, directly linked to the limbic system, making it capable of evoking autobiographical memories and deep emotions without conscious cognitive filtering.

Gustatory experience represents the highest form of multisensory integration, characterized by symbolic and hedonic intensity, which in a hospital setting often functions as an indicator of physical recovery and reconnection with everyday life.

Tactile experience provides a critical mechanism of physical verification (truth-checking) that fosters trust and psychological ownership.

To measure subjective responses, this thesis applies the framework by Wiedmann et al. (2018), originally designed for luxury hotels, as it focuses on subjective consumer evaluations rather than physical parameters. However, recognizing that hospitals are high-credence and high-stress environments where patients prioritize safety and care over pleasure, the author adapted this model by integrating the healthcare-specific perspective from Ugolini et al. (2014). This adaptation ensures the conceptual framework is both theoretically robust and practically relevant to the Vietnamese healthcare system.

2.2. Perceived service quality and customer satisfaction in healthcare

Evaluating service quality in healthcare is inherently complex due to the intangibility, heterogeneity, and inseparability of services (Parasuraman et al., 1985). According to the Nordic school of thought, service quality encompasses technical quality (the clinical outcome) and functional quality, as the service delivery process (Grönroos, 1989). Furthermore, Nelson (1974) and Darby & Karni (1973) classify service

attributes into search, experience, and credence properties. Because medical treatments are predominantly credence services, meaning patients lack the technical expertise to judge clinical accuracy even after consumption, they are compelled to rely heavily on experience properties, specifically tangible sensory cues, to assess functional quality and infer overall technical competence.

This cognitive evaluation, known as perceived service quality (PSQ), serves as an essential antecedent to customer satisfaction (SAT). Grounded in the expectation-disconfirmation paradigm (Oliver, 1981; Day, 1984), satisfaction is the emotional response resulting from the discrepancy between a patient’s prior expectations and the actual perceived performance of the service. While PSQ is a long-term, cumulative attitude evaluating the superiority of the service, satisfaction is a transaction-specific emotional reaction (Parasuraman et al., 1988). In high-stress environments like hospitals, empirical evidence confirms that when patients perceive a safe, clean, and empathetic sensory environment, their perception of service quality is elevated, which subsequently drives satisfaction and loyalty (Zarei et al., 2015; Wulandari et al., 2024).

2.3. Contextualizing healthcare services in Vietnam

The urgency of integrating sensory marketing into healthcare is magnified by the current realities of Vietnam’s healthcare system. Driven by Resolution No. 72-NQ/TW, the sector is shifting towards a patient-centered model with a national goal of exceeding 90% patient satisfaction by 2025 (Politburo, 2025). However, severe systemic imbalances persist. Public hospitals, particularly at the central and provincial levels, operate at over 200% capacity, leading to chaotic visual and auditory environments that exacerbate patient anxiety (International Trade Administration, 2024; FiinGroup, 2024). Simultaneously, the rapidly expanding private healthcare sector

competes by offering premium, hotel-like multisensory experiences, fundamentally altering patient expectations.

Vietnamese patients have evolved into sophisticated consumers who evaluate providers not just on clinical success but on holistic service interactions (Duc Thanh et al., 2022). Recognizing this, the Ministry of Health (2016) institutionalized sensory benchmarks within the Vietnam Hospital Quality Criteria (e.g., clear signage for visual experience, single-bed policies for tactile privacy, and hygienic nutrition for gustatory experience). Therefore, managing sensory experiences is no longer merely a commercial tactic but a mandated strategic priority within Vietnam’s healthcare policy framework.

2.4. Theoretical foundation and research gap

To rigorously explain how sensory environments dictate patient outcomes, this dissertation deliberately adopts a multi-theoretical framework anchored by the S-O-R (Stimulus - Organism - Response) model (Mehrabian & Russell, 1974; Jacoby, 2002).

Stimulus (S): represents the multisensory physical environment. This is supported by servicescape theory (Bitner, 1992), which categorizes ambient conditions, spatial layouts, and signs as external stimuli. Crucially, in a high-credence healthcare context, Signaling theory (Spence, 1973) explains why these tangible sensory inputs are utilized by patients as reliable signals to infer the unobservable clinical competence and safety of the hospital (Bove & Benoit, 2020).

Organism (O): represents the patient’s internal cognitive processing, operationalized in this study as perceived service quality.

Response (R): represents the final affective and behavioral outcome, operationalized as customer satisfaction, guided by expectation-disconfirmation theory (Oliver, 1980). Despite the robust theoretical backing, critical gaps remain. Prior studies have largely examined sensory cues in isolation rather than simultaneously

integrating all five senses within the S-O-R framework in a healthcare context. Furthermore, while Western literature has extensively documented these effects, empirical evidence in Vietnam is scarce. More importantly, the literature lacks a comprehensive understanding of how demographic and institutional boundaries, specifically income disparities and hospital types (public/private), moderate these sensory mechanisms, and how controlling for confounding variables like gender enhances model robustness.

2.5. Proposed research model and hypotheses

Addressing these theoretical and contextual gaps, this dissertation proposes a comprehensive structural model. Driven by S-O-R and signaling theory, the model posits that patients unconsciously rely on the physical environment to evaluate the hospital’s professionalism. Consequently, it is hypothesized that the five distinct sensory dimensions act as direct antecedents to service evaluation. Specifically, visual (H1), auditory (H2), olfactory (H3), gustatory (H4), and tactile (H5) experiences have a positive and significant effect on perceived service quality in healthcare services.

Following the O-R mechanism and expectation-disconfirmation theory, cognitive evaluations dictate affective responses. Thus, it is hypothesized that perceived service quality has a positive direct effect on customer satisfaction (H6). By bridging the external stimuli to the final response, perceived service quality is hypothesized to fully mediate the relationship between visual (H10a), auditory (H10b), olfactory (H10c), gustatory (H10d), tactile (H10e) experiences and customer satisfaction.

Recognizing the heterogeneity of the Vietnamese patient population, the model introduces critical boundary conditions. Higher-income patients, driven by sophisticated experiential expectations, are hypothesized to be more sensitive to sensory cues than lower-income

patients who prioritize functional utility. Hence, Income is hypothesized to positively moderate the relationships between the five sensory experiences and perceived service quality (H7a-e). Similarly, because private hospitals compete on premium servicescapes compared to overcrowded public hospitals, Types of hospital is hypothesized to positively moderate these relationships (H8a-e).

Finally, to rigorously isolate the true effect of sensory marketing, the model incorporates gender as control variables. Rooted in behavioral differences and institutional expectations, the study hypothesizes that male patients perceive higher service quality (H9a) and report higher satisfaction (H9b) than female patients.

These integrated hypotheses form the structural foundation of the study, visually represented in the conceptual framework below.

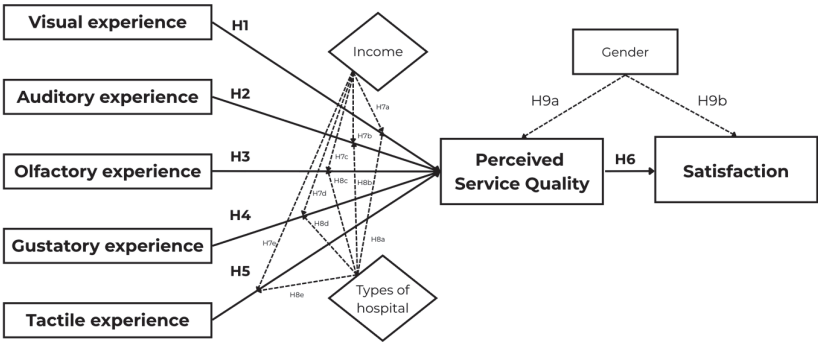


Figure 2.1: Proposed research model

CHAPTER 3. METHODOLOGY

3.1. Research process and design

To rigorously investigate the complex, multidimensional relationships between sensory experiences, perceived service quality, and customer satisfaction, this dissertation employs a mixed-method research design. The research process is systematically structured into

six sequential steps: (1) Theoretical overview and gap identification; (2) Preliminary quantitative research to refine measurement scales; (3) Formal quantitative research via large-scale surveys; (4) Data processing using SPSS and AMOS; (5) Follow-up qualitative research (focus group interviews) to decode the statistical findings; and finally, (6) Discussion and recommendation.

This sequential explanatory approach ensures that the empirical findings are not only statistically significant but also practically meaningful within the culturally specific context of Vietnam's healthcare system.

3.2. Scale development and preliminary testing

Because sensory experience is a highly subjective internal response, capturing it requires a robust measurement instrument. This study deliberately adapted formative measurement scales from Wiedmann et al. (2018), which originally assessed the servicescape from a customer's perspective in luxury environments. To contextualize these scales for the healthcare sector, the study integrated insights from the 5-senses ward model proposed by Ugolini et al. (2014) and theoretical foundations from Hultén et al. (2009), Krishna (2012), Jang & Lee (2019), and Kim et al. (2020). All constructs were measured using a 5-point Likert scale, ranging from 1 (Strongly disagree) to 5 (Strongly agree).

To ensure the comprehensibility and psychometric validity of the instrument in the Vietnamese context, a preliminary quantitative study was conducted with 165 observations. The internal consistency of the initial items was evaluated using Cronbach's Alpha and item-total correlations, retaining items that met the standard thresholds (Nunnally & Bernstein, 1994; Trong & Ngoc, 2008). Subsequently, Exploratory Factor Analysis (EFA) using Principal Axis Factoring with Promax rotation was employed to extract factors and eliminate items with cross-loading issues or factor loadings below 0.50 (Hair et al., 2014).

Following this iterative refinement process, a robust set of 40 measurement items was retained for the formal survey, ensuring strong preliminary reliability and construct validity.

3.3. Formal quantitative research and sample characteristics

For the formal data collection, the study utilized a convenience sampling method, strategically combined with a hybrid online and offline distribution approach to minimize sampling bias. Online questionnaires were disseminated via social networks to reach a broad demographic, while offline paper questionnaires were directly administered to patients at public and private hospitals. This direct approach successfully engaged older adults and higher-income individuals who are less accessible online. The survey was conducted over two months (September to October 2025) across 31 out of 34 provincial-level administrative units in Vietnam, ensuring nationwide representativeness.

Following a rigorous data screening process, a total of 1,313 valid observations were retained. The demographic profile of the sample accurately reflects the contemporary landscape of healthcare service utilization in Vietnam. Specifically, the sample is relatively youthful and working-age dominated, with the largest segments being 18-25 years old (37.2%) and 41-55 years old (27.9%). The gender distribution leans toward female respondents (60.8%), aligning with the cultural reality that women in Vietnam typically manage healthcare decisions for their families.

Economically, the sample is heavily concentrated in the low-to-middle income brackets, with 32.8% earning under 5 million VND/month and 25% earning between 8 and 15 million VND/month. This income structure is logically consistent with the occupational distribution, which includes a high proportion of students (34.5%) and self-employed individuals (15.6%). Finally, the majority of respondents reside in urban areas (65.7%). This urban concentration is particularly relevant to the research objectives, as urban centers feature a highly competitive healthcare market where patients are increasingly

demanding hotel-like sensory environments, forcing both public and private hospitals to differentiate themselves beyond clinical outcomes.

3.4. Follow-up qualitative research

A major methodological strength of this dissertation is the incorporation of a sequential explanatory qualitative phase, conducted immediately after the Structural Equation Modeling (SEM) analysis. While SEM effectively confirming the structural relationships, the qualitative phase was designed to answer reason.

Specifically, face-to-face focus group interviews were conducted with 28 patients directly at the healthcare facilities. To capture the moderating effects hypothesized in the model, the participants were purposively divided into a matrix of four distinct groups (7 respondents each): (1) Low-income patients at public hospitals; (2) High-income patients at public hospitals; (3) Low-income patients at private hospitals; and (4) High-income patients at private hospitals.

The primary objectives of this qualitative phase were threefold. First, to decode the statistical anomaly of why olfactory experience failed to show a significant impact on perceived service quality in the SEM results. Second, to explore how different income groups and genders construct their expectations and interpret sensory signals (e.g., why noise is tolerated in public hospitals but heavily penalized in private ones). Third, to validate the underlying psychological mechanisms that convert external physical stimuli into cognitive service evaluations and ultimate emotional satisfaction. This mixed-method triangulation ensures that the study's conclusions are deeply rooted in the lived realities of Vietnamese patients.

Qualitative data was collected through focus group discussions aimed at further explaining the results obtained from the quantitative study. The data analysis process was carried out using the thematic analysis method proposed by Braun & Clarke (2006), through four main steps and adapted to the author's research practice.

CHAPTER 4: RESEARCH RESULTS AND DISCUSSION

4.1. Descriptive statistics and common method bias assessment

The descriptive analysis of the 1,313 valid observations reveals that Vietnamese patients generally hold a positive perception of the sensory environments in healthcare facilities. Evaluated on a 5-point Likert scale, the mean scores for all five sensory dimensions fall within the *Agree* range (3.45 to 3.92). Specifically, tactile experience (3.92) and visual experience (3.91) received the highest evaluations, indicating that patients highly appreciate the cleanliness, spatial layout, and physical interactions with medical staff. Auditory (3.64), olfactory (3.54), and gustatory (3.45) experiences were rated slightly lower but still reflect an acceptable level of sensory management in hospitals.

Because both independent and dependent variables were collected simultaneously using a self-reported survey, the study rigorously assessed the risk of Common Method Bias (CMB) (Das et al., 2022). A Harman's single-factor test was conducted, revealing that the variance extracted from a single factor for all variables in the model is 40.28%. Since this value is well below the recommended threshold of 50%, it is statistically confirmed that CMB does not pose a threat to the validity of this dataset.

4.2. Measurement model validation

To ensure the robustness of the measurement scales, internal consistency and construct validity were thoroughly examined. The Cronbach's Alpha coefficients for all constructs ranged from 0.821 to 0.907, well above the 0.7 threshold, indicating excellent internal consistency (Hair et al., 2014; Trong & Ngoc, 2008).

Subsequently, a Confirmatory factor analysis (CFA) was conducted to validate the underlying factor structure. To achieve optimal model fit, eight underperforming indicators were systematically removed due to low reliability or high standardized residual covariances. The final measurement model, retaining 32 items,

demonstrated an excellent fit to the empirical data: CFI = .937, GFI = .901, and RMSEA = .053 (Hu & Bentler, 1999). Furthermore, the composite reliability (CR) scores for all latent constructs ranged from 0.746 to 0.907, and the average variance extracted (AVE) values approximated or exceeded the 0.5 threshold, firmly establishing both convergent and discriminant validity (Fornell & Larcker, 1981).

4.3. Structural equation modeling (SEM) and explanatory power

With a validated measurement model, structural equation modeling (SEM) was employed to test the proposed causal relationships. A standout finding of this research is the exceptionally high explanatory power of the model. The squared multiple correlation values indicate that the five sensory dimensions collectively account for 64.9% of the variance in perceived service quality. More remarkably, the model explains 84.1% of the variance in customer satisfaction.

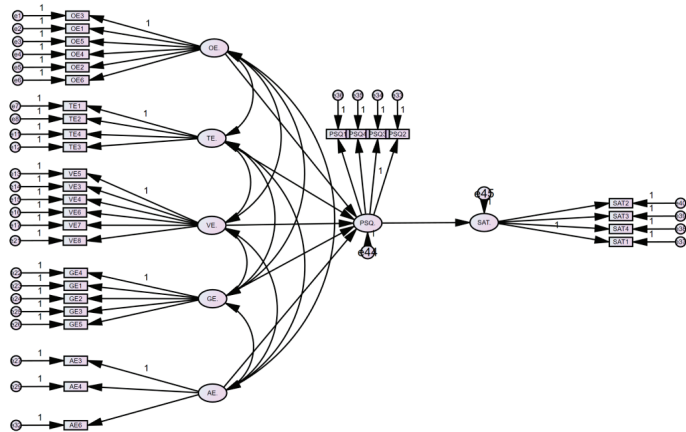


Figure 4.2. Structural Equation Model

Source: Compiled from the author’s research results (2026)

This robust predictive capability signifies a paradigm shift in healthcare evaluation: in high-credence environments where patients cannot easily judge clinical expertise, the sensory servicescape acts as the ultimate surrogate for quality. If a hospital successfully orchestrates

its sensory touchpoints, patient satisfaction becomes a highly predictable outcome.

4.4. Hypothesis testing: the mechanism of sensory impacts

The SEM results successfully illuminate the specific causal mechanisms hypothesized in the S-O-R framework. The data confirms that perceived service quality acts as a powerful mediating conduit (H6 is strongly supported, Beta = .913, $p < 0.001$), translating external sensory stimuli into final emotional satisfaction.

The dominance of visual and tactile experiences: visual experience (VE) emerges as the strongest predictor of service quality (Beta = .297, $p < 0.001$), fully supporting H1 and H10a. In the healthcare context, visual cues such as natural lighting, clear directional signage, and the professional appearance of staff are processed instantly. They serve as the primary basis for reducing uncertainty and inferring organizational competence (Krishna, 2012; Ugolini et al., 2014). Following closely is tactile experience (TE) (Beta = .259, $p < 0.001$), supporting H5 and H10e. For patients who are physically vulnerable, tangible elements, from the softness of bed linens to the gentle, professional touch of a physician during an examination, provide profound reassurance and physical comfort.

The secondary roles of auditory and gustatory experiences: auditory experience (AE) significantly impacts PSQ (Beta = .159, $p = .002$), supporting H2 and H10b. While not as dominant as sight or touch, effective noise control and the empathetic tone of healthcare workers’ voices are critical for emotional regulation. Similarly, gustatory experience (GE) exerts a modest but statistically significant effect (Beta = .128, $p = .001$), supporting H4 and H10d. Although food is ancillary to medical treatment, hygienic and diverse nutritional options symbolize comprehensive care, especially for inpatients.

The olfactory anomaly (H3 and H10c rejected): a fascinating empirical divergence occurred regarding olfactory experience (OE). The SEM results firmly rejected its direct and indirect impact on PSQ ($p = .279$). This contradicts Western literature, which often positions ambient scent as a powerful enhancer of service experiences (Mavrommatis et al., 2011; Ugolini et al., 2014).

4.5. Examining the moderating effects

The moderating role of income: the findings reveal that Income significantly and positively moderates the impacts of visual ($p = .013$), auditory ($p = .002$), and tactile ($p = .033$) experiences on PSQ. This indicates that while lower-income patients prioritize basic clinical utility, rising financial capacity fundamentally alters expectations. Higher-income patients exhibit acute sensitivity to aesthetic harmony, acoustic privacy, and premium physical comfort, demanding a multi-sensory environment commensurate with the high costs they pay.

The moderating role of types of hospital: The preference between public and private hospitals significantly moderates gustatory ($p = .011$) and auditory ($p = .071$) experiences. Patients utilizing private healthcare exhibit significantly higher expectations for holistic care, transforming ancillary services like hospital meals and acoustic tranquility into critical determinants of perceived quality.

4.6. Examining the controlling role of gender

To ensure the model's robustness, gender and types of hospital were introduced as control variables. The empirical data confirmed that gender significantly influences PSQ ($p = .030$), with male patients tending to rate service quality higher than female patients, corroborating the qualitative finding that men are generally more tolerant of environmental nuances. However, gender does not statistically differentiate overall customer Satisfaction ($p = .266$).

4.5. Follow-up qualitative insights

To explain the rejection of the olfactory hypothesis and to gain deeper context, a follow-up qualitative phase involving focus group interviews with 28 patients was conducted. The qualitative findings brilliantly demystify the SEM results.

In the Vietnamese healthcare context, patients do not use scent to infer clinical competence. The prevalent hospital smell (disinfectants and alcohol) has been culturally internalized as a baseline indicator of hygiene and biological safety, rather than an experiential enhancer. As shared by respondents, the absence of foul odors (such as in restrooms) is a minimum expectation. Therefore, a pleasant scent does not significantly elevate their perception of medical excellence, explaining the statistical failure of olfactory experience.

Furthermore, the qualitative interviews revealed profound psychological divergences between patient segments:

Public/Private hospitals: patients at public hospitals adopt a pragmatic mindset, tolerating noise and crowds in exchange for access to leading clinical experts. In contrast, patients at private hospitals (especially higher income customers) utilize a hospitality-based frame of reference, where any minor sensory failure, a disorganized lobby or loud staff, is deemed an unacceptable service breakdown.

Gender differences: female patients exhibited heightened sensitivity to privacy, clinical cleanliness, and empathetic communication. Male patients, conversely, approached the experience rationally, prioritizing speed, efficiency, and diagnostic outcomes, demonstrating a higher tolerance for environmental shortcomings.

CHAPTER 5: DISCUSSION AND RECOMMENDATIONS

5.1. Conclusion on key research findings and theoretical contributions

This dissertation systematically decoded the psychological mechanisms through which Vietnamese patients evaluate healthcare services, proving that sensory experiences are fundamental drivers of perceived quality. The empirical model demonstrated exceptional explanatory power, with sensory dimensions accounting for 64.9% of the variance in perceived service quality (PSQ) and ultimately explaining 84.1% of the variance in customer satisfaction (SAT).

The structural equation modeling (SEM) confirmed the S-O-R mechanism with a distinct hierarchy of sensory influence. Visual experience (28.6% impact) and tactile experience (25.1%) emerged as the dominant factors, acting as the cognitive foundation of patient trust and physical comfort (Krishna, 2012; Ugolini et al., 2014; Alahakoon & Randiwela, 2017). Auditory experience (16.6%) and gustatory experience (11.5%) also significantly shape the service atmosphere and holistic care perceptions. A profound theoretical contribution lies in decoding the olfactory anomaly. While Western literature frequently praises ambient scent as a service enhancer (Mavrommatis et al., 2011; Jang & Lee, 2019), this study firmly rejected its impact in Vietnam. Qualitative findings illuminated that patients associate the hospital smell (disinfectants) solely with baseline biological safety, rather than an experiential differentiator.

Furthermore, the study successfully expanded the theoretical framework by confirming critical boundary conditions. Income significantly moderates visual, auditory, and tactile experiences, while types of hospital moderates gustatory and auditory experiences, demonstrating that high-income and private hospital patients demand premium, hospitality-based sensory environments.

Finally, incorporating gender and types of hospital as control variables proved that while male patients pragmatically rate functional quality higher and private hospitals generate higher ultimate satisfaction, the core S-O-R causal mechanism remains universally robust across all segments.

5.2. Macro-level policy recommendations

To achieve the national target of 90% public satisfaction by 2030 (Ministry of Health, 2024), sensory marketing must be integrated into the strategic management of Vietnam's healthcare system.

First, prioritizing spatial expansion for private healthcare. High-income patients demand exceptional visual and auditory environments, driving a significant portion of the US\$2 billion spent annually on overseas medical tourism (FiinGroup, 2024). To realize Resolution No. 72-NQ/TW (Politburo, 2025), aiming to increase private hospital beds to 15% by 2030, the Government must facilitate clean land allocation for private healthcare. Without ample physical space, investors cannot design the international-standard, multi-sensory complexes required to retain patients domestically.

Second, reforming the medical procurement mechanism toward value-based procurement. Tactile and auditory experiences strongly impact perceived quality. However, Vietnam's current public bidding overemphasizes the lowest price criterion, creating barriers to patient-friendly equipment. Policymakers must adopt a value-based procurement approach (AmCham Vietnam, 2024), where technical parameters related to patient sensory comfort (e.g., low-noise emissions, ergonomic design) are heavily weighted in bidding evaluations.

Third, strictly enforcing the Vietnam hospital quality criteria. The Ministry of Health should rigorously monitor existing physical standards codified in Decision 6858/QĐ-BYT (Ministry of Health,

2016). Enforcing visual criteria (clear directional signage, criterion A1.1), tactile criteria (strict one-bed-per-patient policy, criterion A2.1), and fundamental olfactory management in restrooms (criterion A2.2) is a non-negotiable prerequisite for alleviating the sensory burden in overcrowded public hospitals.

5.3. Micro-level recommendations for hospital management

At the operational level, hospital administrators must proactively orchestrate the servicescape. Visual management requires optimizing natural lighting, warm color palettes, and clear signage to reduce patient navigation anxiety. Tactile management demands investing in ergonomic seating and emphasizing the art of touch, ensuring clinical examinations are conducted with gentleness and respect. For auditory and gustatory aspects, hospitals must implement architectural soundproofing in sensitive areas, modulate the volume of public address systems, and diversify hygienic menus to enhance the inpatient recovery experience. Crucially, interventions must be segmented: private hospitals require premium, hotel-like sensory investments (absolute acoustic privacy, superior culinary options), while overcrowded public hospitals should prioritize functional sensory relief like basic noise reduction and strict odor control.

5.4. Limitations and future research directions

Limitations

Sampling limitations: the convenience sampling approach resulted in a sample skewed towards young, female, urban, and low-to-middle-income populations, limiting the generalizability to rural areas and very high-income groups.

Methodological risks: the reliance on cross-sectional, self-reported data carries a residual risk of Common Method Bias, meaning causal inferences from the SEM results must be evaluated cautiously.

Discriminant validity boundary: there is a very high correlation between perceived service quality and customer satisfaction due to their conceptual closeness in healthcare, acting as a boundary condition for construct distinctiveness.

Unexplored variables: the current model did not control for several potentially influential factors, such as patient age, education level, health insurance coverage, and specific disease types.

Future research directions

Expanding sampling methods: future studies should employ stratified random sampling to broaden geographical and demographic coverage, particularly targeting rural, remote patients, and specific localities.

Incorporating new variables: exploring new moderating and controlling variables (e.g., age, education level, disease type) will provide deeper insights tailored to specific patient segments.

Shifting to the provider’s perspective: expanding qualitative research to include hospital directors and medical staff will help assess the practical feasibility of implementing multi-sensory management strategies.

Applying neuromarketing tools: integrating objective biometric tools (e.g., eye-tracking, heart rate sensors) will allow for the precise measurement of subconscious sensory responses and effectively mitigate the biases of self-reported surveys.

**LIST OF WORKS RELATED TO THE DISSERTATION
THAT THE PHD CANDIDATE HAS PUBLISHED**

1. Tran, V.A. and Nguyen, T.L. (2026), 'How patients experience care through their senses: Sensory experiences, perceived service quality, and patient satisfaction in Vietnamese hospitals', *Multidisciplinary Reviews*, Vol. 9, Article e2026555. <https://doi.org/10.31893/multirev.2026555>.
2. Tran, V.A. (2026), 'Patient experience at the public vs. private hospitals in Viet Nam', *Vietnam Economic & Financial Review*, Vol. 2 No. 2, pp. 157-160.