

STRUCTURAL EQUATION MODELING ON PATIENT SATISFACTION THROUGH HOSPITAL SERVICE QUALITY: A STUDY ON CORPORATE HOSPITALS IN COIMBATORE

V. Uma ¹, N. Amutha ^{2*}

¹ Professor and Head, Department of Hospital Administration,

Dr. N.G.P Arts and Science College, Coimbatore-641035, India. uma@drngpasc.ac.in,

² Research scholar, Dr. N.G.P Arts and Science

College, Coimbatore-641035, India. amuthaswetha1976@gmail.com,

* Correspondence: amuthaswetha1976@gmail.com

Abstract

Because it affects treatment compliance, patient loyalty, and ultimately health outcomes, patient satisfaction with healthcare services is a crucial indicator for healthcare companies. In order to identify areas for improvement, this research examines the causal relationship between hospital quality and patient satisfaction. With a sample of 305 patients in a diverse population, this study employed primary data from Coimbatore, a two-tier city in Tamilnadu state in southern India. Significant correlations between a number of variables were discovered by the study, with the clinical treatment and administrative processes showing very substantial influence on the corresponding outcomes. This study discusses the mediational pathways and influencing elements of the service quality component.

KEYWORDS: hospitals management, service quality, patient satisfaction, Structural equation model.

1. Introduction

From emerging pandemic diseases to the growing life style diseases, healthcare providers face increasingly complex demands (Atun et al, 2013). Despite significant improvements in the era, universal healthcare coverage is still difficult job for many countries. It need a lot of innovative practices and investments in healthcare infrastructure, resources, and technology. In the context of India, a country marked by its cultural diversity, demographic complexity, and economic disparities, healthcare assumes paramount significance as it strives to address the healthcare needs of a vast and heterogeneous population (Mehta, 2018). India faces unique challenges ranging from inadequate infrastructure resource to inequitable access of quality treatments.

Patient satisfaction with healthcare services is a critical metric for healthcare organizations as it impacts patient loyalty, treatment adherence, and ultimately, health outcomes. Understanding the factors that influence patient satisfaction is crucial for providers to improve the patient experience and deliver high-quality care.

The following objectives were framed based on the above issues.

- Assess the impact of affordability of corporate hospitals in Coimbatore city toward patient satisfaction
- Analyse the causal effect of hospital quality on patient satisfaction and to suggest the points of improvement.

2. Review of Literature:

Patient satisfaction assessment often relies on emotional responses (Wu et al. 2008), who utilized two items to gauge patient satisfaction based on affective reactions. These items were tailored to capture patients' overall experiences within the hospital environment. According to Zeithaml and Bitner (2000), satisfaction hinges on the alignment of perceived service performance with customer expectations, indicating that patients' satisfaction levels can be influenced by their perceptions of the quality of service received. Assessing patient satisfaction involves considering both objective performance and subjective perceptions, as the emotional aspect underscores the importance of holistic care experiences. Aligning service delivery with patient expectations is crucial for maintaining high satisfaction levels, and effective management of patient expectations can lead to improved satisfaction outcomes. Understanding the interplay between perceived performance and emotional responses is key to enhancing patient satisfaction in healthcare settings.

Patient satisfaction encompasses various dimensions, as highlighted by Urden (2002), who suggests that it involves cognitive, emotional, and subjective perception. It signifies the interpersonal relationships in shaping customer satisfaction within healthcare settings. Similarly, Crowe et al. (2002) emphasize that the quality of interpersonal relationships between patients and healthcare providers is crucial for overall satisfaction. Alhashem et al. (2011) support this notion by demonstrating that the quality of the relationship between patients and doctors significantly impacts patient satisfaction. Furthermore, Campbell et al. (2000) provided a framework for understanding patient satisfaction, defining it as the assessment of whether care services meet expectations. This perspective aligns with the broader discourse on patient satisfaction, highlighting the importance of meeting patient expectations and fostering positive interpersonal interactions within healthcare delivery.

2.1 Key Factors of Healthcare Service-Quality in Hospitals

1. Infrastructure: Infrastructure plays an important role in determining the quality of the healthcare services and studies have shown that hospitals with modern, well-equipped facilities and adequate resources tend to deliver better patient outcomes and experiences. Access to state-of-the-art medical equipment, well-designed hospital buildings, and efficient support services such as laboratories, imaging facilities, and pharmacies contribute to improved diagnosis, treatment, and patient satisfaction (Fadda, 2019).

2. Personnel Quality: The quality of healthcare personnel, including doctors, nurses, and support staff, is a critical determinant of healthcare quality in hospitals and various research studies indicates that hospitals with highly skilled, knowledgeable, and compassionate healthcare professionals tend to provide better patient care and outcomes. Factors such as staffing levels, training programs, professional development opportunities, and staff-patient communication skills influence the quality of care delivered and patient experiences (Nabbuye-Sekandi et al. 2011).

3. Process of Clinical service: The process of clinical service, including diagnosis, treatment, and follow-up, significantly impacts healthcare quality in hospitals and evidence-based clinical guidelines, standardized protocols, and interdisciplinary care teams contribute to safer, more effective patient care. Hospitals that prioritize care coordination, continuity of care, and patient-centric approaches tend to achieve better clinical outcomes and higher levels of patient satisfaction (Cheng et al. 2003).

4. Administrative Procedure: Efficient administrative procedures and processes are essential for ensuring smooth hospital operations and optimal patient experiences. Streamlined admission, discharge, and billing processes, along with effective communication and coordination between departments, enhance patient flow and reduce waiting times. Additionally, transparent billing practices, patient-friendly policies, and responsive customer service contribute to positive hospital experiences and perceptions (Yeh et al. 2018).

5. **Safety Measures:** Patient safety is a cornerstone of healthcare quality in hospitals, with efforts to prevent medical errors, infections, and adverse events paramount. Hospitals that implement robust safety protocols, including hand hygiene practices, medication reconciliation processes, and infection control measures, demonstrate a commitment to patient safety and quality improvement. Adherence to accreditation standards, participation in quality improvement initiatives, and regular safety audits contribute to a culture of safety and continuous improvement (Riman et al 2023).

6. **Hospital Image:** The reputation and image of a hospital influence patient perceptions and choices regarding healthcare services and hospitals with a positive reputation for delivering high-quality care, excellent outcomes, and positive patient experiences tend to attract more patients and maintain patient loyalty. Factors such as brand recognition, patient testimonials, and online reviews shape hospital image and reputation in the community (Ramli, 2017).

7. **Social Responsibility:** Hospitals play a vital role in addressing the broader health needs of society beyond clinical care and social responsibility initiatives, such as community health programs, health education campaigns, and outreach services, demonstrate a hospital's commitment to improving population health and addressing social determinants of health. Hospitals that engage in socially responsible activities contribute to community well-being and build trust and goodwill among patients and stakeholders (Liu et al. 2016).

8. **Trustworthiness of the Hospital:** Trustworthiness is a key factor influencing patient perceptions of hospital quality and safety and hospitals that demonstrate integrity, transparency, and accountability in their operations and interactions with patients and stakeholders build trust and confidence. Trustworthy hospitals prioritize patient interests, honor commitments, and communicate openly and honestly, fostering positive patient-provider relationships and enhancing overall healthcare quality (Kazemi et al. 2013).

Affordability

Affordability is an important concept, but it is hard to define, and this has much to do with the fact that defining affordability is a normative issue (Niëns and Brouwer, 2013). A service is unaffordable when its price exceeds the total budget a person can afford, however, healthcare service is unaffordable if the patient, after the treatment, does not have enough money or insurance coverage left to fulfill their basic fees, medicine and regular expenses (Niëns and Brouwer, 2013).

2.2 Theoretical framework: From the above literature support, the following hypotheses (also exhibited in the figure 1) are framed for this research.

hypothesis:

Ha: Hospital service quality significantly influences the dependent variable satisfaction of patients.

Hb: Affordability of the patients significantly influences the satisfaction of patients.

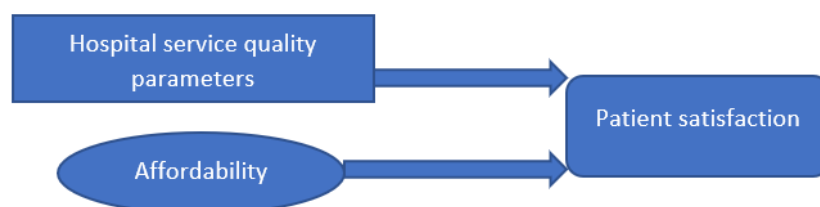


Figure 1 Theoretical model for the patient satisfaction

3. Methods

This study used Primary data in Coimbatore, a two-tier city in south India, Tamilnadu state. It is fast growing city which doesn't discriminate rural and urban in their basic infrastructure facilities and connectivity. Therefore, a study conducted in this study well represent the state of health care system and the theory development of patient satisfaction. Respondents (Patients or their attenders) in and around Coimbatore city those who already visited some corporate hospitals are chosen. A direct

personal interview method was applied for data collection through Questionnaire framed from various sources Sanil and Eminer (2021). Two stage cluster sampling: A few hospital clusters are selected at random and from which convenience sampling method used with the sample size of 305. Smart PLS software is used for the structural equation modelling. The survey of 180 female and 105 male respondents answered from both rural (150) and urban (155) and from age categories of Young (20%), Middle age (60%) and old age (20%) revealed the results given in the following chapter.

4. Results

The structural model is given in the **figure 2**. Regression coefficients and associated probability of wrong significance of the research hypothesis (p values) are given in the link between the constructs. The dependent variable patient satisfaction is regressed with hospital service quality parameters and affordability for the patients.

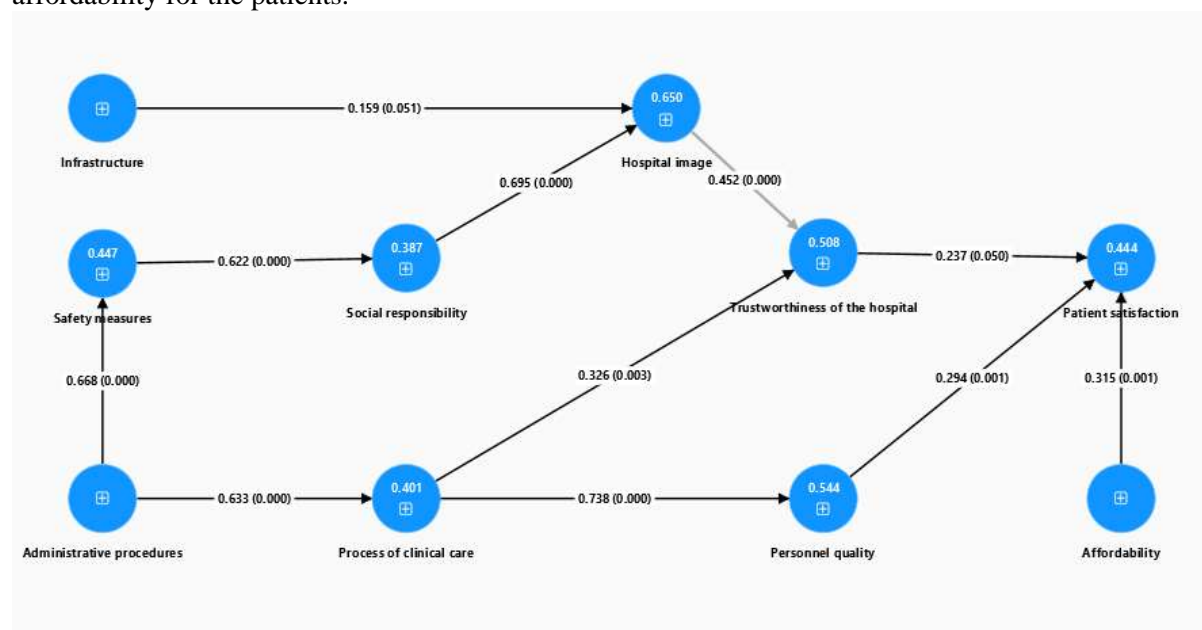


Figure 2 SEM model for the patient satisfaction

Table 1 Structural model results

| | Original sample (O) | Sample mean (M) | Standard deviation | T statistics | P values |
|---|---------------------|-----------------|--------------------|--------------|----------|
| Administrative procedures -> Process of clinical care | 0.633 | 0.636 | 0.070 | 9.109 | 0.000 |
| Administrative procedures -> Safety measures | 0.668 | 0.666 | 0.063 | 10.566 | 0.000 |
| Affordability -> Patient satisfaction | 0.315 | 0.324 | 0.095 | 3.299 | 0.001 |
| Hospital image -> Trustworthiness of the hospital | 0.452 | 0.458 | 0.118 | 3.835 | 0.000 |
| Infrastructure -> Hospital image | 0.159 | 0.174 | 0.081 | 1.957 | 0.051 |
| Personnel quality -> Patient satisfaction | 0.294 | 0.300 | 0.088 | 3.344 | 0.001 |
| Process of clinical care -> Personnel quality | 0.738 | 0.737 | 0.081 | 9.075 | 0.000 |
| Process of clinical care -> Trustworthiness of the hospital | 0.326 | 0.320 | 0.111 | 2.950 | 0.003 |
| Safety measures -> Social responsibility | 0.622 | 0.616 | 0.063 | 9.800 | 0.000 |

| | | | | | |
|--|-------|-------|-------|-------|-------|
| Social responsibility Hospital image -> | 0.695 | 0.680 | 0.077 | 9.033 | 0.000 |
| Trustworthiness of the hospital -> Patient satisfaction | 0.237 | 0.231 | 0.121 | 1.962 | 0.050 |

Following are the statistical interpretation of the **Table 1**.

- **Administrative procedures → Process of clinical care:** The path (standardized regression) coefficient was significant, $\beta = 0.633$, $t(9.109)$, $p < 0.001$. This indicates that administrative procedures had a strong, positive influence on the process of clinical care.
- **Administrative procedures → Safety measures:** The path coefficient was significant, $\beta = 0.668$, $t(10.566)$, $p < 0.001$. Administrative procedures had a strong, positive effect on safety measures.
- **Affordability → Patient satisfaction:** The path coefficient was significant, $\beta = 0.315$, $t(3.299)$, $p = 0.001$. Affordability had a moderate, positive influence on patient satisfaction.
- **Hospital image → Trustworthiness of the hospital:** The path coefficient was significant, $\beta = 0.452$, $t(3.835)$, $p < 0.001$. Hospital image positively affected the perceived trustworthiness of the hospital.
- **Infrastructure → Hospital image:** The path coefficient was marginally significant, $\beta = 0.159$, $t(1.957)$, $p = 0.051$. This suggests that infrastructure may have a weaker influence on the hospital image.
- **Personnel quality → Patient satisfaction:** The path coefficient was significant, $\beta = 0.294$, $t(3.344)$, $p = 0.001$. Personnel quality had a moderate, positive effect on patient satisfaction.
- **Process of clinical care → Personnel quality:** The path coefficient was significant, $\beta = 0.738$, $t(9.075)$, $p < 0.001$. The process of clinical care strongly predicted personnel quality.
- **Process of clinical care → Trustworthiness of the hospital:** The path coefficient was significant, $\beta = 0.326$, $t(2.950)$, $p = 0.003$. The process of clinical care had a moderate, positive effect on the hospital's trustworthiness.
- **Safety measures → Social responsibility:** The path coefficient was significant, $\beta = 0.622$, $t(9.800)$, $p < 0.001$. Safety measures has a strong and positive impact on social responsibility.
- **Social responsibility → Hospital image:** The path coefficient was significant, $\beta = 0.695$, $t(9.033)$, $p < 0.001$. Social responsibility has a strong and positive influence on hospital image.
- **Trustworthiness of the hospital → Patient satisfaction:** The path coefficient was marginally significant, $\beta = 0.237$, $t(1.962)$, $p = 0.050$. Trustworthiness of the hospital had a modest but positive effect on patient satisfaction.

These results suggest significant relationships between several variables, with particularly strong effects observed from **process of clinical care** and **administrative procedures** on their respective outcomes. Additionally, **safety measures** and **social responsibility** are strongly linked to **hospital image** and **social responsibility**, respectively.

5. Discussion

1. **Administrative Procedures and Clinical Care/Safety Measures:** Administrative procedures are foundational in ensuring that hospital operations run smoothly and efficiently. When administrative protocols are clear and well-executed, clinical processes are more organized, leading to better coordination of patient care. For example, streamlined paperwork, efficient scheduling, and proper communication channels reduce bottlenecks, allowing healthcare professionals to focus on delivering high-quality clinical care. Additionally, effective administrative procedures support robust safety measures. Hospitals must comply with stringent safety protocols to minimize risks to both patients and staff. Well-organized administrative systems ensure that these safety protocols are monitored, updated, and followed consistently, contributing to a safer healthcare environment.

2. **Affordability and Patient Satisfaction:** Affordability plays a critical role in shaping patients' perceptions of their care experience. When healthcare services are perceived as affordable, patients more likely feel satisfied with the care they receive because they are less burdened by financial stress. In an environment where healthcare costs are a significant concern, offering affordable care can enhance patients' overall satisfaction and make them more likely to recommend the hospital to others.
3. **Hospital Image and Trustworthiness:** A hospital's image is closely tied to its reputation and perceived competence. If a hospital has a positive public image, it suggests that the institution is reliable, professional, and capable of providing high-quality care. This leads to an increase in patients' trust in the hospital, as they feel more confident in the services provided. Trust is a crucial factor in healthcare, as it directly affects patients' willingness to engage with and rely on the healthcare institution.
4. **Infrastructure and Hospital Image:** While the impact of infrastructure on hospital image appears to be weaker, it is still important. Modern, well-maintained facilities can enhance a hospital's image, conveying a sense of professionalism and competence. However, infrastructure alone may not significantly influence the hospital's overall reputation unless paired with excellent service and care.
5. **Personnel Quality and Patient Satisfaction:** The quality of hospital personnel, including doctors, nurses, and support staff, is a critical factor in determining patient satisfaction. Patients are more likely to have positive experiences when they perceive the staff as skilled, compassionate, and attentive. Personnel who engage with patients effectively, communicate clearly, and provide excellent care foster a positive care environment, directly enhancing patient satisfaction.
6. **Process of Clinical service and Personnel Quality/Trustworthiness:** The process of clinical service refers to the actual treatment and services provided to patients. Efficient clinical processes help ensure that medical care is delivered promptly and effectively, improving the perceived quality of the personnel. When clinical care is well-coordinated and patient-focused, staff members are seen as competent and professional, which boosts their perceived quality in the eyes of patients.
Moreover, efficient and patient-centered clinical care also bolsters trustworthiness. When patients experience well-executed medical care, their confidence in the hospital's ability to manage their health needs increases, enhancing the hospital's overall trustworthiness.
7. **Safety Measures and Social Responsibility:** Safety measures are integral to a hospital's commitment to patient well-being and public health. When hospitals consistently enforce safety protocols—such as infection control, proper handling of medical equipment, and patient monitoring—they demonstrate a commitment to ethical practices and responsible healthcare delivery. This, in turn, enhances the hospital's social responsibility, as patients and the broader community recognize the institution's dedication to maintaining a safe and ethical healthcare environment.
8. **Social Responsibility and Hospital Image:** A hospital that prioritizes social responsibility by engaging in community health initiatives, promoting sustainability, and maintaining ethical standards builds a positive image. Social responsibility initiatives show that the hospital cares not only about profits but also about the well-being of the community and society at large. This enhances its image as a reputable, community-focused institution, leading to increased patient loyalty and positive word-of-mouth.
9. **Trustworthiness and Patient Satisfaction:** Trust is a main driver of patient satisfaction. When patients trust their hospital and its staff, they are more likely to feel at ease, confident that they are receiving the best possible care. Trust can come from a variety of factors, including the hospital's reputation, the quality of care, and the professionalism of the staff. This emotional connection and confidence can show an higher levels of patient satisfaction, even when challenges arise.

To enhance patient satisfaction in today's competitive healthcare settings, healthcare organizations must adopt a patient-centred approach which prioritizes the needs, preferences, and experiences of patients and this may involve implementing patient-centred care models, improving

communication and interpersonal skills among healthcare providers, streamlining access to care, and leveraging technology to enhance the patient experience. By continually striving to enhance patient satisfaction, healthcare organizations can differentiate themselves in the marketplace. They can build patient loyalty and achieve success in today's competitive healthcare environment. In addition, the hospital administration should focus on reinforcing strong administrative procedures, enhancing personnel quality, and promoting social responsibility to improve both patient care and the hospital's overall reputation.

A holistic approach that integrates operational efficiency, clinical excellence, and a commitment to community well-being will lead to better patient satisfaction and long-term success. Infrastructure, Administrative procedures and affordability are the ultimate manipulating variables and focus points for the managerial actions.

6. Conclusion

In addition to providing statistically significant results of the linkages that have been nonspecifically reported by other studies, this paper elaborated on the aspects that contribute to patient satisfaction. This study discusses the mediational pathways and influencing elements of the service quality component. The hospital management team can immediately address and rectify the influencing aspects of infrastructure, administrative procedures, and affordability. Despite being a good sample of medical centers in southern India, this research is limited to a single geographic area. Therefore, it is advised that future study cover a wide area. Accessibility to healthcare is the primary element that may impact patient happiness, particularly in developing nations, while doing the same in other countries.

REFERENCES

- [1] A. M. Alhashem, H. Alquraini and R. I. Chowdhury, "Factors influencing patient satisfaction in primary healthcare clinics in Kuwait", *Int. J. Health Care Qual. Assur.*, vol. 24, no. 3, (2011), pp. 249–262.
- [2] R. Atun, S. Jaffar, S. Nishtar, F. M. Knaul, M. L. Barreto, M. Nyirenda, ... and P. Piot, "Improving responsiveness of health systems to non-communicable diseases", *The Lancet*, vol. 381, no. 9867, (2013), pp. 690–697.
- [3] S. M. Campbell, M. O. Roland and S. A. Buetow, "Defining quality of care", *Social Sci. Med.*, vol. 41, no. 11, (2000), pp. 1611–1625.
- [4] S. H. Cheng, M. C. Yang and T. L. Chiang, "Patient satisfaction with and recommendation of a hospital: effects of interpersonal and technical aspects of hospital care", *Int. J. Qual. Health Care*, vol. 15, no. 4, (2003), pp. 345–355.
- [5] R. Crowe, et al., "The measurement of satisfaction with healthcare: implications for practice from a systematic review of the literature", *Health Technol. Assess.*, vol. 6, no. 32, (2002), pp. 1–244.
- [6] J. Fadda, "Quality of healthcare: A review of the impact of the hospital physical environment on improving quality of care", in *Sustainable Building for a Cleaner Environment: Selected Papers from the World Renewable Energy Network's Med Green Forum 2017*, Springer Int. Publishing, (2019), pp. 217–253.
- [7] N. Kazemi, P. Ehsani, F. Abdi and M. Bighami, "Measuring hospital service quality and its influence on patient satisfaction: An empirical study using structural equation modeling", *Manag. Sci. Lett.*, vol. 3, no. 7, (2013), pp. 2125–2136.
- [8] W. Liu, L. Shi, R. W. Pong and Y. Chen, "How patients think about social responsibility of public hospitals in China?", *BMC Health Serv. Res.*, vol. 16, (2016), pp. 1–8.
- [9] P. Mehta, "Framework of Indian healthcare system and its challenges: an insight", in *Health Economics and Healthcare Reform: Breakthroughs in Research and Practice*, IGI Global, (2018), pp. 405–429.
- [10] J. Nabbuye-Sekandi, et al., "Patient satisfaction with services in outpatient clinics at Mulago hospital, Uganda", *Int. J. Qual. Health Care*, vol. 23, no. 5, (2011), pp. 516–523.

- [11] L. M. Niëns and W. B. F. Brouwer, “Measuring the affordability of medicines: importance and challenges”, *Health Policy*, vol. 112, no. 1–2, (2013), pp. 45–52.
- [12] A. H. Ramli, “Patient satisfaction, hospital image and patient loyalty in West Sulawesi Province”, *Business Entrepreneurial Rev.*, vol. 17, no. 1, (2017), pp. 1–14.
- [13] M. Sanil and F. Eminer, “An integrative model of patients’ perceived value of healthcare service quality in North Cyprus”, *Arch. Public Health*, vol. 79, (2021), pp. 1–16.
- [14] T. Urden, “Patient satisfaction: a cognitive approach”, *J. Nurs. Care Qual.*, vol. 16, no. 1, (2002), pp. 21–25.
- [15] H. L. Wu, C. H. Liu and W. H. Hsu, “An integrative model of customers’ perceptions of health care services in Taiwan”, *Serv. Ind. J.*, vol. 28, no. 9, (2008), pp. 1307–1319.
- [16] M. Y. Yeh, S. C. Wu and T. H. Tung, “The relation between patient education, patient empowerment and patient satisfaction: A cross-sectional-comparison study”, *Appl. Nurs. Res.*, vol. 39, (2018), pp. 11–17.
- [17] V. A. Zeithaml and M. J. Bitner, *Services Marketing: Integrating Customer Focus across the Firm*, McGraw-Hill, New York, NY, (2000).