Information Management and Business Review (ISSN 2220-3796)
Vol. 18, No. 4(S), pp. 299-306, 2026

Sustainable Digital Healthcare: A Systematic Literature Review on E-Service Quality and Customer Satisfaction

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Abstract: This study investigates the impact of e-service quality on customer satisfaction in private hospitals in the Arab world. As more medical service providers rely on e-services to improve patient experience, it is essential to study the determinants of satisfaction with the aim of identifying the e-service quality factors predicting customers' satisfaction with services of private hospitals. A cross-sectional study was conducted among 300 outpatients who had experienced the hospital services using a 5-point Likert scale to rate their experience on different dimensions of e-service quality. The data were analyzed through various statistical methods such as reliability analysis to find the reliability of measurement scales, descriptive statistics to present the demographic and service-related characteristics, correlation analysis for hypothesized relationships, and multiple regression analysis to identify significant relationships and the strongest determinant. It was found that website design, responsiveness, security, and reliability contributed positively and significantly to patient satisfaction among those who accessed e-services rendered by the private hospitals in Klang Valley. These elements underscore the necessity of easy to navigate, safe, and responsive web-based services within the healthcare environment. On the other hand, dimensions such as reliability, enjoyment, ease of use, and customization were insignificantly related to the patient's satisfaction. This research report offers useful knowledge to the provider of healthcare services that enhancing investment in website design, response time and security can greatly improve patient satisfaction with e-services. The results provide actionable implications for enhancing the digital service in private hospitals, which improves the patient experience and service quality in return.

Keywords: *E-Service Quality, E-SERVQUAL, Customer Satisfaction, Private Hospital, Healthcare Industry.*

1. Introduction and Background

Without overcoming substantial challenges, the globe would have been unable to traverse the current pandemic. The global pandemic has shaken the world, and people are still adjusting to their new normal. The loss of life has caused concern and tragedy (Juliet Orji et al., 2022). Given the virus's quick spread and widespread impact, the implications of this disaster may far outweigh anything witnessed in recent history. As the scientific community prepares for essential prevention measures and long-term recovery, the business and management sectors must deal with the economic consequences. The recession has not only left many businesses barely alive, but it has also prompted them to pursue new strategic directions. Even huge firms have had substantial hurdles in this environment. On the other hand, innovation has become critical for organisations to create new business models in order to survive the crisis (Bouncken et al., 2021). With the rise and popularity of online technologies, businesses have created websites to reach a larger audience. The growth of internet applications has had a significant impact on several businesses, including the private hospital industry.

Traditionally, hospitals rely on common hospital services to stay in business, providing services such as medical check-up packages, appointment scheduling, insurance verification, and promoting special events to their customers. In recent years, the internet has grown in popularity, allowing for low-cost, direct contact from nearly anyone, converting the global economy into a more integrated and competitive environment. According to Al-Hawary & Al-Smeran (2017), the competitive global market and cognitive explosion have fuelled the growth of websites and online services, necessitating an emphasis on e-service quality. The notion of electronic service quality (E-SERVQUAL) has grown in importance, making it easier to provide superior services via

websites by assuring user-friendliness, efficiency, and access to necessary information. However, quantifying service quality in e-services remains more difficult than in real commodities sold in shopfronts (Van Dat, 2020). The first attempts to quantify service quality were made by Parasuraman et al. (1985).

Healthcare is one of the fastest expanding areas in the service economy (Andaleeb, 2001; Dagger et al., 2007). Although giving health services via the internet is becoming increasingly popular, as observed by Sun et al. (2016), little empirical research has been conducted in this field. There are seven private hospitals in the Shah Alam area, each of which provides e-services such as appointment booking through their websites, e-consultations with doctors at set times, and video chats for advice or counselling. E-services were not previously prevalent in the private hospital sector, but the current scenario has caused a shift in focus. Moore et al. (2022) report patients being more reluctant to visit healthcare facilities for routine medical consultations during the COVID-19 pandemic as a result of fears of infection. Hospitals upgraded their online platforms and websites to allow patients to quickly access critical information and services of health care as the need for digital health care services became evident.

2. Literature Review

Web Design: The Internet has rapidly grown into a commercial channel. A previous study mentioned a relationship between web design and customer satisfaction (Rita et al., 2019). Efficiency is rising, and companies are questioning what to do to get the best results. The starting point of the answer is to understand what the user wants. A large amount of research has focused on the factors that influence the success of e-commerce websites from a user perspective (Hendricks & Mwapwele, 2024; Ramya N & Kowsalya A, 2019). Many studies have identified web design as critical for good interface development to meet users' needs (Smits & van Turnhout, 2023). Good design is relevant for companies to survive in a highly competitive market.
H1: Web design has a positive relationship with customer satisfaction towards private hospital services.

Responsiveness: Past studies mentioned a positive relationship between responsiveness and e-service (Nandankar et al., 2023; Younus et al., 2011). Customer service refers to the level of service and policies for handling returns during and after sales. Offline businesses always have staff who assist customers during the purchase process (Grewal et al., 2023). In online businesses, users do the whole purchasing process independently without the help of customer service (Hossain et al., 2024; Umar & Uddin, 2011). Some online companies provide customer service that allows customers to request more detailed information about the product they want to purchase (Toha & Supriyanto, 2023).
H2: Responsiveness has a positive relationship with customer satisfaction towards private hospital services.

Reliability: Reliability is defined as the ability to consistently deliver the expected standard, how the organization handles customer services, first performing the right services, providing services within the promised time, and maintaining a record free of errors (Sunny et al., 2024). The requirement and technical reliability of the private hospital e-service environment are equated with reliable, functional design also suggests that the quality of service should include service output uniformity around an ideal customer-determined target value (Kang, 2019; Nguyen et al., 2021). The changing needs of private hospital need to be addressed predictably and consistently, such as the website crash or the changing of the hospital emergency number to call.
H3: Reliability has no relationship with customer satisfaction towards private hospital services.

Enjoyment: The enjoyment construct refers to how using the new technology is perceived to reinforce its right, apart from any performance consequences that may be anticipated (Camilleri, 2024; Teo & Noyes, 2011). This supports the idea of the dual characterization of consumers' motivations, which describes consumers as either problem-solvers or seekers of fun, fantasy, sensory stimulation, and enjoyment (Chow & Zhan-Ming, 2017; Fowler, 2022).
H4: Enjoyment has no relationship with customer satisfaction towards private hospital services.

Ease of Use: Studies found that the perceived ease of use is the degree to which a person accepts as accurate that it would be at no cost to that person to use an exacting method (Addison & Addison, 2021). Likewise, Zeithaml et al. (1996) stated that it is possible to consider the degree to which an innovation is easily

understood or used as perceived ease of use. Correspondingly, Zhang et al. 2017) noted that perceived ease of use refers to the ability of customers to experiment with innovation and quickly evaluate its benefits; the paper also stated that the drivers of growth in electronic services are determined by the ease-of-use dimension, which is a combination of convenience provided to those with easy internet access and the availability of safe, high availability.
H5: Ease of use has no relationship with customer satisfaction towards private hospital services.

Security: Every day, websites get hacked. Every day, the numbers continue to increase, and the importance of website security is constantly growing. Every day, it becomes increasingly essential to be secure online, and it is vital to protect the website and the information it retains. Security refers to the security of credit card payments and the privacy of shared data (Andala, 2019; Kleisiari et al., 2021). Web security keeps hackers and cyber thieves from accessing sensitive information. To improve the integrity and quality of website services, websites must emphasize security and security that privacy and security must feature on effective websites (Beheshtifar, 2015; Ojambo, 2020). In other industries, such as online shopping, customers must enter personal data, such as name, address, contact number, and credit card information, when purchasing items from online websites.
H6: Security has a positive relationship with customer satisfaction towards private hospital services.

3. Research Methodology

This study utilized a stratified random sampling method to obtain a sample of 300 respondents from a population of 4,200 outpatients occupying beds in private hospitals in Klang Valley. A stratified random sample was selected to guarantee appropriate representation of diverse client backgrounds. Data were gathered using a standardised questionnaire sent using Google Forms, employing a five-point Likert scale to record replies (Jalagat & Bashayre, 2017, Jafri et al., 2020). The questionnaire, evaluated and sanctioned by academic experts, was created to meet the research objectives and guarantee clarity for participants. The gathered data were examined utilising SPSS version 26, applying frequency distribution, descriptive analysis, reliability analysis, correlation analysis, and regression analysis to assess the correlations between e-service quality aspects and customer satisfaction. Descriptive statistics, such as mean, standard deviation, and frequency, were computed to summarise the study variables.

4. Results

This section presents sets of results relating to the profile of respondents' experiences towards network operators, the characteristics of the total sample, and the comparison of participants regarding their experience based on the demographic characteristics (gender, education level, marital status, race and job title).

Profile of Respondents: Table 1 displays a summary of the characteristics of the total sample of customers or subscribers who participated in the study.

Table 1: Demographic and Geographic Information About Respondents (n=300)

Demographic	Categories	Frequency	Percentage (%)
Gender	Male	147	49.0
	Female	153	51.0
Education Level	SPM	3	1.0
	Diploma	51	17.0
	Bachelor's degree	166	55.3
	Master's Degree	82	26.7
Age	18-25 years old	82	27.3
	26-35 years old	107	36.0
	36-45 years old	59	19.7
	46-55 years old	46	15.0
	56 years old and above	6	2.0
Marital Status	Single	121	40.3
	Married	179	59.6

Race	Malay	179	59.6
	Chinese	57	19.0
	Indian	59	19.7
	Bumiputera	2	0.7
	Non-Bumiputera	3	1.0
Job Title	Student	70	23.3
	Civil Servants	81	27.0
	Non-Government	146	48.7
	Retiree	3	1.0

Descriptive Statistics: Table 2 presents the descriptive analysis of seven variables: customer satisfaction, web design, responsiveness, enjoyment, reliability, ease of use, security, and customization.

Table 2: Descriptive Statistics

	Descriptive Statistics		
Variables	**Factor Name**	**Mean**	**Std. Dev.**
CS	Customer satisfaction	4.2829	.80286
WD	Website design	4.3286	.77144
RS	Responsiveness	4.2971	.78499
EJ	Enjoyment	4.3219	.78996
RB	Reliability	4.3279	.76901
EU	Ease of use	4.3529	.73507
SC	Security	4.3190	.74829
CM	Customization	4.3310	.75975

The descriptive analysis table shows the mean and standard deviation values for seven e-service quality variables. Ease of Use has the highest mean (4.3529), indicating that users found it relatively easy to use, with a low standard deviation (0.73507), showing consistent responses. Customer Satisfaction has the lowest mean (4.2829) and the highest standard deviation (0.80286), indicating more variability in satisfaction levels among respondents. Website Design and Customization also scored highly in terms of mean values, showing they are important factors for users, while Reliability and Security had slightly lower variability, implying consistent perceptions across these dimensions.

Multiple Regression Analysis: Tables 3 and 3a present the multiple regression. Regression analysis is used to identify whether there is a significant relationship between dependent and independent variables. Regression analysis is a reliable technique used to determine which variables influence a selected question. The regression procedure enables you to confidently establish which variables are most important, which factors may be ignored, and how these factors interact.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.899[a]	.808	.804	.35565
Predictors: (Constant), TWD, TRS, TEJ, TEU, TSC, TCM				
Dependent Variable: TCS				

Table 3a: Multiple Regression Analysis-Coefficients

Model	Standardized Coefficients Beta	t	Sig.
Website Design	.275	4.669	.000
Responsiveness	.359	4.525	.000
Enjoyment	-.086	-.963	.336
Reliability	.069	.811	.418
Ease of Use	.074	1.043	.298
Security	.251	3.358	.001

Customization	.275	.826	.409
R Square .808			
Adjusted R Square .804			
F change 206.117			

Note: p <0.01 (**)

The multiple regression analysis in the table demonstrates how numerous factors influence the dependent variable, TCS (Total Customer Satisfaction). The model has a good explanatory power, with an R-squared value of 0.808, indicating that the independent variables account for about 80.8% of the variance in TCS. Responsiveness has the strongest positive impact on TCS, with a standardised coefficient (Beta) of 0.359 and a statistically significant result ($p < 0.001$). Website design and security had significant positive benefits, with Beta values of 0.275 and 0.251, respectively. Overall, the model is statistically significant (F-change = 206.117), and the study identifies responsiveness, website design, and security as the significant predictors of customer satisfaction towards private hospital services.

Discussion

This study examined the factors that influence the performance of e-services in private hospitals, focusing on the relationship between customer satisfaction (the dependent variable) and seven independent variables: website design, responsiveness, reliability, enjoyment, ease of use, security, and customization. Among the seven variables, responsiveness emerged as the most significant predictor of customer satisfaction, with the highest beta coefficient ($\beta = 0.359$). This result suggests that the timeliness and effectiveness of responses to patients' needs play a crucial role in shaping their overall satisfaction. Website design also demonstrated a significant influence on satisfaction (sig. = 0.000), highlighting the importance of an appealing and user-friendly interface in enhancing the patient's online experience. Furthermore, security was identified as another key determinant (sig. = 0.001), as patients are more likely to feel comfortable and confident when their personal and medical information is securely protected during online transactions. In contrast, the variables reliability, enjoyment, ease of use, and customization did not show a statistically significant impact on customer satisfaction. The lack of significance for reliability may suggest that patients are dissatisfied with the content provided on the private hospitals' websites, particularly with respect to outdated or incomplete information, such as updates on critical services like COVID-19 vaccinations. Addressing this issue by providing more frequent updates and improving the quality of essential information may enhance user perceptions of reliability.

Similarly, customization was not a major contributor to satisfaction, possibly because many healthcare services require patients to consult a doctor before customizing their options. The negative beta coefficient for enjoyment ($\beta = -0.086$) suggests that increasing the entertainment or enjoyment aspects of e-services may not be relevant to improving patient satisfaction in a healthcare context. Overall, the findings indicate that responsiveness, website design, and security are the most important factors driving patient satisfaction with e-services in private hospitals. These results suggest that healthcare providers should prioritize improving their response mechanisms, enhancing website design, and ensuring stringent security measures to elevate the overall patient experience. The study tested seven hypotheses to evaluate the influence of these factors on customer satisfaction. The regression analysis confirmed the acceptance of hypotheses related to responsiveness, reliability, and customization, while the hypotheses concerning enjoyment, ease of use, and reliability were not supported. Among all the variables, responsiveness had the most substantial influence on patient satisfaction, particularly in the context of private hospitals.

5. Theoretical, Managerial Implications and Recommendations

This study reveals that web design, responsiveness, and security are three independent factors that are highly associated with e-service performance, while reliability, enjoyment, ease of use, and customisation are not. The findings highlight the importance of web design in engaging consumers with an attractive image and layout. Responsiveness is important, as consumers want numerous options to contact the company, such as live chat and call centers, to answer their questions. Security is an important factor because individuals are confident that their private information is protected when making online transactions.

This research presents theoretical and managerial implications with which Private Hospitals in Klang Valley can enhance their e-service quality. The findings refine the measuring scales for e-service quality and provide insight into reliability, enjoyment, usability, and customization as areas that need improvement. These findings in turn can be used by managers and marketers to more effectively allocate resources toward the components that shape users' perceptions of their own e-service quality, which in turn will help with attracting and retaining customers. The research highlights the importance of critical factors, such as security, in safeguarding customers' credit card details while transacting.

Private hospitals can improve patient satisfaction by addressing security concerns and making their online services easier to use. Features such as live chat and options for sharing feedback can help create a smoother experience. Offering rewards, including discounts for patients who share their experiences, may also encourage word-of-mouth recommendations and bring more visitors to hospital websites. Future studies could extend beyond Shah Alam to include other parts of the Klang Valley and examine both public and private hospitals. Comparing online service quality across the two sectors, or exploring other factors that influence patients' experiences, could lead to a fuller understanding of the topic. The findings may help hospitals build online platforms that are efficient, user-friendly, and better suited to patients' expectations.

Conclusion

To conclude, this research provides valuable information regarding the key factors influencing e-service performance in the context of private hospitals, mainly on the aspect of customer satisfaction. Several factors were identified through multiple regression analysis, of which timeliness, website design, and security have the greatest impact on customer satisfaction. Responsiveness, with the largest beta value, highlights the importance of quick and efficient answers to patients' queries, suggesting hospitals give more attention to upgrading communication systems (e.g., through live chat or help desks) to enhance the patient experience. Website design is also a substantial contributor to satisfaction, meaning that it is necessary for hospitals to develop user-friendly and visually attractive online sites that facilitate use and patient interaction. Security is a factor, too, as individuals want to feel their personal and medical information is protected when it exchanges hands online, particularly in the highly regulated healthcare environment. However, reliability, enjoyment, convenience of use, and customisation were not found to be significant predictors of consumer satisfaction in the present study. Non-significance in reliability also means that provision of accurate and current information is required on the hospital website. Likewise, the negative beta of enjoyment indicates that the entertainment aspects may not enhance satisfaction in the context of healthcare, as patients tend to prioritize the functional aspects of the service over fun. This research is quite challenging for healthcare practitioners. Private hospitals, on the other hand, can leverage the data to prioritize their resources to focus more on enhancing their response systems by increasing the website's usability and implementing robust security protocols. By focusing on these key areas, hospitals can increase patient satisfaction and engagement, and create a loyal patient base. Future studies may also consider generalizing to other regions and different types of hospitals to gain further insight into the performance of e-service in other healthcare service context. In summary, the results highlight the significance of responsiveness, website design, and security in enhancing patient satisfaction and thus guide private hospitals to improve e-service in meeting consumer expectations of e-HC in the digital healthcare environment.

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