



Structural equation model to assess patient satisfaction with university dental services

Modelo de ecuaciones estructurales para evaluar la satisfacción de pacientes en servicios odontológicos universitarios

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Abstract

The present work is carried out from the perspective of Health Marketing considering the variables of the SERVPERF model: responsiveness, trust, tangible elements, empathy, hygiene, safety. The objective is to evaluate the relationship between service quality and patient satisfaction in the Dental Care Clinics of the School of Dentistry of the Autonomous University of Coahuila. In addition, hygiene is incorporated as a new construct to help improve the perception of quality in health-related services and its effect on user satisfaction.

The results of the empirical study are obtained by applying a Structural Equation Model (SEM) evaluating the theoretical model through Partial Least Squares Analysis (PLS) with Smart PLS software. Path Analysis is used to determine the correlation between variables and it is found that the estimates obtained for the model have a significant impact on user satisfaction, where it is observed that the R² of the model is 0.781, which makes the relationship explained by the confirmatory model relevant. The hygiene construct was significant and helped to increase the R² value and consequently the degree of explanation of the model.

The results of this work contribute to the improvement of the model for health-related service providers, where hygiene is a determining attribute in the perception of service quality and user satisfaction. As for

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the practical implications of this study, results can be useful to improve the quality of services provided in health organizations.

JEL Code: M00, M31, I11

Keywords: service satisfaction; hygiene; healthcare marketing; dental services

Resumen

El presente trabajo se realiza desde la perspectiva de la Mercadotecnia Sanitaria considerando las variables del modelo SERVPERF: capacidad de respuesta, confianza, elementos tangibles, empatía, seguridad. El objetivo es evaluar la relación de la calidad del servicio en la satisfacción de los pacientes en las Clínicas de Atención Dental de la Facultad de Odontología de la Universidad Autónoma de Coahuila. Así mismo se incorpora la higiene como nuevo constructo que ayude a mejorar la percepción de la calidad en los servicios relacionados con la salud y su efecto en la satisfacción del usuario.

Los resultados del estudio empírico se obtienen al aplicar un Modelo de Ecuaciones Estructurales (SEM) evaluando el modelo teórico mediante Análisis de Mínimos Cuadrados Parciales (PLS) con el software Smart PLS. Se utiliza el Análisis de Senderos (PATH Analysis) para determinar la correlación entre variables y se encuentra que las estimaciones obtenidas para el modelo tienen un impacto significativo en la satisfacción de los usuarios, donde se observa que la R^2 del modelo es de 0.781 lo que hace relevante la relación explicada del modelo confirmatorio. El constructo de higiene resultó significativo y ayudó a aumentar el valor de la R^2 y en consecuencia el grado de explicación del modelo.

Los resultados de este trabajo contribuyen al mejoramiento del modelo para prestadores de servicio relacionados con la salud, donde la higiene constituye un atributo determinante en la percepción de la calidad en el servicio y la satisfacción del usuario. En cuanto a las implicaciones prácticas de este estudio los resultados pueden ser útiles para mejorar la calidad de los servicios prestados en organizaciones sanitarias.

Código JEL: M00, M31, I11

Palabras clave: satisfacción en el servicio; higiene; mercadotecnia sanitaria; servicios odontológicos

Introduction

In this post-pandemic era, consumers are more demanding regarding the quality of healthcare services they need. Knowing what they want and determining the level of quality offered to them is important to meet their expectations. Today's organizations increasingly rely on first-hand information to understand the evolution of their target markets. Specifically, field research supports the design of marketing strategies and the generation of competitive advantages that help improve perceptions of healthcare institutions. The dental services market has become very competitive, and given the need to generate empirical evidence, this paper aims to assess the relation between the quality of the service offered at the School of Dentistry and patient satisfaction.

Contextual framework

Mexico's Health Sector Plan 2019-2024 establishes that one of the major objectives in the health field is access and quality care in primary services. Therefore, according to Arias Hernández et al. (2020), health systems should strive to meet patients' expectations in both technical and interpersonal dimensions. The quality of health services must go beyond the baseline of service coverage to be assessed.

In the case of the state of Coahuila, the Government (2018) reports that 70% of the population receives social security through the State Health Program 2017-2023, which provides 95% of the state's population with access to some type of institutional health service. It also found that, in terms of infrastructure, there are currently 228 service units scattered throughout the territory, including 10 general hospitals, three specialty hospitals, and 133 urban and rural health centers. Notwithstanding, the health system lags in the rehabilitation and maintenance of service units, equipment, instruments, medicines and health supplies, and medical personnel, impacting the service quality.

In the particular case of this study, the dental services offered by the School of Dentistry of the Universidad Autónoma de Coahuila in Saltillo contribute to the health system in the state, providing services to the low-income population. The university has six Dental Care Clinics, which offer low-cost services to the general population with a daily attention rate of 100 to 200 patients. Services are offered from 8:00 a.m. to 3:00 p.m. and from 4:00 p.m. to 8:00 p.m. from Monday to Friday, and from 9:00 a.m. to 1:00 p.m. on Saturdays. The services are offered by students in the sixth semester of their studies or higher, depending on the characteristics of the treatment, and are supervised by specialist dentists. In general, the services offered are perceived to be of good quality.

Previous studies conducted in these university clinics have identified safety as the dimension with the greatest impact on user satisfaction. At the same time, tangibility is the dimension perceived as having the lowest quality of service, specifically in the physical facilities of the clinic, equipment, and promotional material for dental services (Morales, 2020). This paper aims to carry out this research project by providing an explanatory analysis using Structural Equation Modeling (SEM) and by adding an additional construct (i.e., hygiene) to the Service Performance (SERVPERF) model to help improve its ability to estimate the dental service quality, as suggested by some researchers.

Review of the literature

This section presents the theoretical aspects that support the hypotheses put forward in the proposed empirical model and, therefore, an explanation of each of the variables is presented below:

Healthcare marketing and patient satisfaction

Marketing is a tool for health management as it makes it possible to detect and respond to health needs based on research, assessment, and analysis of health demand and patient satisfaction and to carry out this identification to anticipate and satisfy both requirements (Suárez Lugo, 2002).

Moreover, the relevance of the topic in question after the COVID-19 health crisis is self-evident.

The primary objective of marketing is to achieve customer welfare by satisfying their needs and desires. To this end, it is essential to know the expectations and perceptions of patients to guide strategies toward their satisfaction.

Şantaş et al. (2016) postulate that managers need to understand perceptions of healthcare organizations to get consumers of healthcare services to prefer them.

Consumer perceptions are important in understanding what ultimately leads to consumer satisfaction with a given hospital or healthcare facility. A key pathway of academic research is to identify the most salient attributes of healthcare facilities consumers consider when making a choice (Ford, Honeycutt, & Hoffman, 2015).

Patient satisfaction depends on perceived service quality, which is the main factor in healthcare innovations (Subhadra & Sanar, 2018), making its study essential.

Service quality

Assessing the services offered from the users' point of view is a determining factor in understanding the target markets. In recent years, there has been an increase in healthcare services, so competition among hospitals to attract customers is even greater. Furthermore, patients expect better healthcare services as they witness technological advances in the medical field. One of the challenges for hospitals is maintaining patient loyalty to increase revenue and stay competitive. Moreover, Natalya Angela and Bawono Adisasmito (2019) consider that another factor influencing brand loyalty is the service provider's image, which shows that the study of quality involves a multidimensional analysis.

Studies of quality in health services, based on social science methodologies, have been carried out mainly based on the assessment of health professionals and the perspective of the patient's perception.

This paper is based on user perception. Two of the most widely used models for assessing service quality are the SERVQUAL model, proposed by Parasuraman, Berry, and Zeithaml (1988), and its reexamined and extended version by Cronin and Taylor (1992), called SERVPERF. Both techniques are explained below to lay the groundwork for a better understanding of the extension proposed for the latter model.

SERVQUAL model and service quality in dental clinics

The SERVQUAL model allows companies to measure their service quality through knowledge of customer expectations and perceptions. Zeithaml, Parasuraman, and Berry developed the model in their studies for their paper “A multiple-item scale for measuring consumer perceptions of service quality.” Their multidimensional approach identifies five critical areas: reliability of services, safety understood as the capacity to generate trust, sensitivity, empathy of service providers, and the tangible elements or facilities of the institution.

Previous studies worldwide have highlighted the importance of some of these dimensions when assessing dental services.

For example, a study was conducted in a specialized dental clinic affiliated with the Armed Forces of the Islamic Republic of Iran in Tehran in 2013, in which 385 patients answered the SERVQUAL questionnaire. The study showed that the quality of services provided to patients was significantly lower than their expectations, concluding that the managers of this clinic should take measures to improve the quality of services in all dimensions, especially responsiveness and empathy (Dopeykar et al., 2018).

Subhadra and Sanar (2018), intending to find out the experience levels of patient satisfaction with service quality in Swedish dental clinics, found that the image of the healthcare facility affects the perceived service quality. As service quality is one of the key factors among service innovations that contribute to business development and a leading position in the highly competitive business world, and patient satisfaction is important for any healthcare organization, patient satisfaction improves the image of the hospital/clinic. This translates into increased use of services provided by healthcare systems and increases market share.

This study was based on a quantitative and qualitative analysis (i.e., mixed method approach). The question was analyzed by interviewing the staff of private and public dental clinics and by applying the SERVQUAL methodology to their patients. The results of the surveys showed that the empathy factor had the highest positive effect, and responsiveness, which is based on the patient’s waiting time before seeing the dentist, had the lowest effect. The researchers found that there was an area of opportunity to improve services by installing new technological products and changing the appearance of the clinic.

In India, Sitaraman et al. (2020) assessed the quality of treatment received by patients in a special care dentistry department. The study population was 384 patients. The participant or the participant’s caregiver was asked to fill out the SERVQUAL model expectations questionnaire, and the required dental treatment was provided. After treatment, the participant was asked to complete the perception questionnaire. Multiple statistical analyses were performed to calculate the discrepancy between perception and expectation scores, denoted by the statistical term “Gap value”. Physician

engagement was found to be the most important factor. All five domains of the SERVQUAL model showed high expectation and perception scores, and positive gap values, concluding that the SERVQUAL model is an effective tool for assessing dental services.

Finally, the Master's degree work of Salazar Montoya (2018) at the Catholic University of Santiago de Guayaquil shows the results of the SERVQUAL survey applied to a sample of 206 dental clinic patients. The results showed aspects to improve: waiting time limits, appointment spacing, processes, and results obtained.

Nevertheless, despite the effectiveness demonstrated in its application, the SERVQUAL model involves a certain difficulty because users must respond to 22 items on two occasions since they must first express their expectations of the service and, once received, assess it with the same measurement instrument. Cronin and Taylor (1994) propose a simplified SERVPERF version to avoid this drawback.

SERVPERF model

The SERVPERF scale (Cronin & Taylor, 1994) is based on the theoretical foundations of the SERVQUAL Model of Parasuraman, Berry, and Zeithaml (1988). According to Cronin and Taylor (1994), perceived quality assessments are based solely on assessing perceptions of the attributes of the service received, leaving expectations out of the analysis. Their research findings support the measurement of service received as the sole measure of perceived quality, and they state that service quality correlates strongly with user satisfaction. Essentially, they propose that consumer satisfaction depends on service quality.

A paper by Hashem and Ali (2019)—aimed at measuring the level of service quality of Jordanian dental clinics from the perspective of their customers—applied the SERVPERF scale, which consists of five dimensions of service quality: tangibility, reliability, responsiveness, assurance, and empathy. The questionnaires were distributed among 250 customers of dental clinics in Jordan, and the data collected show that the level of service quality of dental clinics has a statistically significant positive impact on customer loyalty. In light of these results, the researchers recommend improving the quality level of dental services by providing services that meet or exceed customer expectations.

This research is based on the SERVPERF model to assess the perception of the service provided by the Universidad Autónoma de Coahuila dental clinics. For this purpose, the following conceptualization of the dimensions proposed by the model is carried out:

Empathy

Empathy refers to the level of individualized attention companies offer to their customers. It should be conveyed through personalized service or service tailored to the client's preferences (Matsumoto Nishizawa, 2014). Consequently, empathy is a competence of the dental service staff expressed through treatment and care provided to patients.

Trust

For Lindsay-Resnick (2017), in an environment where consumer trust is at an all-time low, successful healthcare organizations must work hard to establish themselves as trusted resources for information and services within their industry segment, whether as a supplier or vendor of services. Establishing trust and creating value begins with positioning their brand in the marketplace and their ability to convey that they provide quality services.

Responsiveness

The World Health Organization (WHO) World Health Report 2000, Health Systems: Improving Performance, first developed the concept of health systems responsiveness as one of the three main objectives a health system should have. Health system responsiveness was defined as the ability of health systems to respond to the legitimate expectations of their population in the non-medical aspects of health care, i.e., how people are cared for and the environment in which they are treated, prioritizing the personal experience of the patient's contact with the health system.

The responsiveness of health systems is measured in eight domains classified in two main categories: those referring to respect for individuals (dignity, confidentiality, communication, and self-determination) and those oriented to the patient (prompt care, basic quality of services, access to social support, and choice of supplier) (Rodríguez Eguizabal et al., 2022).

Safety

Şantaş et al. (2016) conducted a study in Turkey to determine the perceptions of healthcare consumers concerning public, university, and private hospitals. For this purpose, a survey was conducted with 283 patients who received healthcare in the outpatient services of a hospital. The research shows that

consumers perceive private hospitals as the best in terms of reputation, service quality, and physical facilities. Nonetheless, 56.5% of the respondents prefer public hospitals as they perceive them as the most affordable option compared to private hospitals, which offer more expensive services. Consequently, it can be assumed that low-cost public health services can be perceived as safe and quality services, which makes the application of the model to the object of study relevant.

Tangible elements

As hospitals only provide services, customers find it difficult to assess them due to the absence of a tangible product, so the variables that make up the social and physical context of service delivery are considered peripheral manifestations, which are tangible evidence of service delivery (Ford, Honeycutt, & Hoffman, 2015). Consequently, users were asked to assess the physical facilities available at the university clinics.

Regarding the tangible elements and the security and trust that a health services institution can generate, the authors consider hygiene an easily identifiable attribute that can impact the perception of the health services received. If the facilities and equipment are perceived as lacking cleanliness, there is an impact on the perception of quality of service, as suggested by Pedraza-Melo et al. (2014) in their assessment of hospital services in Mexico. For this reason, it is recommended to incorporate the hygiene variable, which is of special relevance after the COVID-19 pandemic, into the model.

Hygiene

In the COVID-19 health crisis context, providing health services with measures to prevent infection in dental care is challenging. According to Martínez-Camus and Yévenes-Huaiquino (2020), there is no universal protocol for care during the COVID-19 outbreak; recommendations are constantly evolving as new characteristics of the SARS-CoV-2 virus are determined. Nonetheless, precautionary measures should be taken before, during, and after dental care to reduce the risk of transmission between the patient and dental health care personnel.

After reviewing the literature on the variables involved in the SERVPERF model, the working hypotheses to be tested are presented below:

H1: Tangible items have a direct and positive relation with patients' satisfaction regarding the dental services received.

H2: The trust that the staff provides has a direct and positive relation with the patients' satisfaction regarding the dental services received.

H3: Responsiveness in providing prompt and efficient services directly and positively relates to patient satisfaction regarding the dental services received.

H4: Perceived safety directly and positively relates to patients' satisfaction regarding the dental services received.

H5: Empathy of doctors and students working in dental clinics directly and positively relates to patient satisfaction.

H6: Hygiene measures provided directly and positively relate to patients' satisfaction regarding the dental services received.

Methodology

Research design

An exploratory, quantitative, cross-sectional study was carried out using a questionnaire with the participation of seventy patients. The PLS-SEM method has been shown to work adequately with small samples. For 6 relations in the model, it is acceptable to use a minimum of 70 data items (Marcoulides & Saunders, 2006). The instrument consists of 23 items using the SERVPERF model scale (Cronin & Taylor, 1994) to measure perceptions about the experiences and quality of dental services using the five dimensions: tangible elements, empathy, reliability, responsiveness, and safety. The hygiene dimension is added with two items (The dental clinic had good hygiene, and The doctors and students took the necessary hygiene measures), as well as patient satisfaction obtained through the statement "I am very satisfied with the service, and I highly recommend it."

Table 1

Applied operational definition of the 5 constructs of the SERVPERF Scale and the 2 constructs incorporated into the model

#	Construct	Variables No.	Items
1	Tangible elements	4	1. The dental clinic at the UAdeC School of Dentistry has modern-looking equipment. 2. The physical facilities of the dental clinic are visually appealing. 3. The doctors and students working in the dental clinic have a good appearance. 4. The material associated with the provider (such as brochures or communications) is visually appealing in the dental clinic.
2	Reliability	4	5. When the dental clinic promises to do something by a certain date, it does as it says.

			6. When a problem occurs, the dental clinic is sincerely interested in solving it.
			7. The dental clinic performs the service properly the first time.
			8. The dental clinic performs its services when it promises to do so.
3	Responsiveness	4	9. The doctors and students working in the clinic let the patient know exactly when services will be carried out.
			10. The doctors and students working in the clinic provide prompt service.
			11. The doctors and students working in the clinic are always willing to help patients.
			12. The doctors and students working in the clinic are too busy to answer questions.
4	Safety	4	13. The behavior of the doctors and students working in the clinic inspires confidence.
			14. The patient feels safe with the services offered by the UAdeC School of Dentistry dental clinic.
			15. Doctors and students working in the clinic are usually nice to patients.
			16. The doctors and students working in the clinic are knowledgeable enough to answer patient's questions.
5	Empathy	4	17. The dental clinic has appropriate opening hours for all its customers.
			18. Prices at the dental clinic are affordable.
			19. The doctors and students working in the clinic understand patients' particular needs.
			20. The dental clinic is interested in acting in patients' best interests.
6	Hygiene	2	21. The dental clinic had good hygiene.
			22. The doctors and students took the necessary hygiene measures.
7	Satisfaction	1	23. I am very satisfied with the service, and I highly recommend it.

Source: created by the authors with data from Cronin and Taylor (1994).

The results of the empirical study were obtained by applying a Structural Equation Model (SEM), assessing the theoretical model through Partial Least Squares Analysis (PLS) with SmartPLS software. PATH Analysis was used to determine the correlation between variables, and it was found that the estimates obtained for the model have a significant impact on user satisfaction, where it is observed that the r^2 of the model is 0.781, which makes the explained relation of the confirmatory model relevant.

Results and discussion

The inferential analysis was carried out with the SmartPLS 4 tool that allows assessment in two phases (Hair Jr., Bush, & Ortinau, 2010): a) measurement model (psychometric properties of the scale used to

measure a variable) and b) estimation of the structural model (the strength and direction of the relations between the variables).

The findings are presented below:

a) *Measurement model*

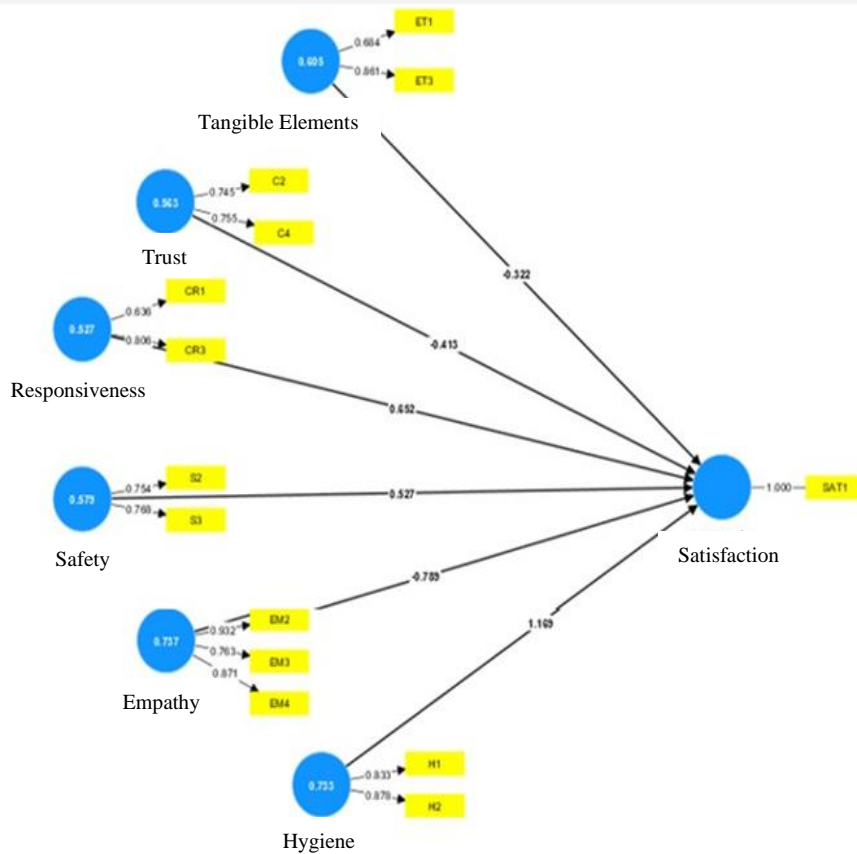


Figure 1. Patient Satisfaction with Dental Services Measurement Model

Source: created by the authors

Regarding item reliability, when running the PLS algorithm, all items show acceptable values since the loading factors range from 0.636 to 0.932, and the minimum value criterion is 0.70.

Table 2

Reliability and construct validity: Cronbach's alpha, Composite Reliability, and Convergent Validity

	Construct	Cronbach's alpha	Rho_c	AVE
1	Tangible elements	0.741	0.751	0.605
2	Trust	0.72	0.72	0.563
3	Responsiveness	0.701	0.703	0.527
4	Safety	0.713	0.733	0.579
5	Empathy	0.882	0.893	0.737
6	Hygiene	0.845	0.846	0.733

Source: created by the authors

Table 2 shows that the Cronbach's Alpha statistic for all items is above 0.701, meeting the criterion of the minimum value of 0.70. Likewise, the composite reliability (rho_c) of all the items has values greater than 0.703 (Hair, Bush, & Ortinau, 2010).

Convergent validity is carried out through the AVE, where the values of all the model dimensions are greater than 0.50 (Fornell & Larcker, 1981). The model considers reflective indicators, so it applies this analysis.

b) *Structural model*

The approximate fit of the model is verified with the Standardized Root Mean Square Residual (SRMR) analysis, which is the divergence of the model's observed and implied correlation matrices. The values are less than 0.08, which represents a good fit (Hu & Bentler 1998 cited by Medina-Quintero, Ábrego-Almazán, & Echeverría-Ríos 2021). Table 3 shows that a value of 0.079 is obtained, complying with the abovementioned criterion.

Table 3

Model fit with SRMR analysis

	Original sample (O)	Sample Mean (M)	95%	99%
Saturated model	0.079	0.052	0.074	0.086
Estimated model	0.079	0.052	0.074	0.086

Source: created by the authors

Two-tailed full Bootstrapping is used for structural model validation and hypothesis testing. According to Gonzalez Huelva (2018), Bootstrapping is a nonparametric procedure that can be used to test the statistical significance of PLS.SEM results.

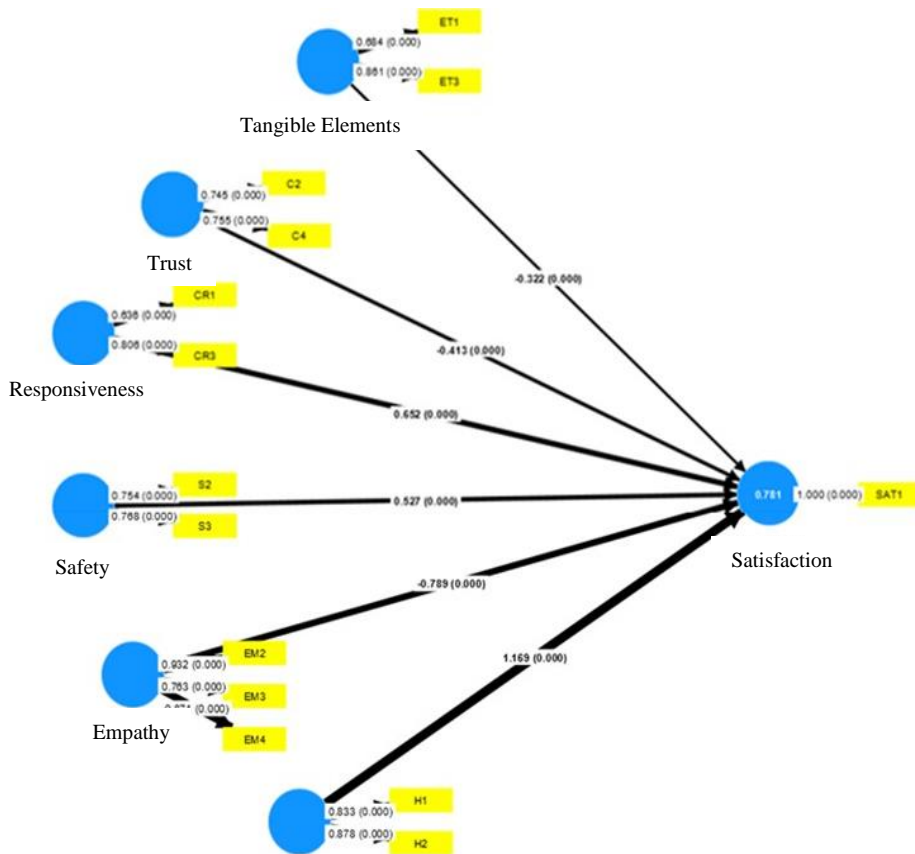


Figure 2. Patient Satisfaction with the Bootstrapping Model
Source: created by the authors

In the PLS nomogram, Figure 2 shows that all items are significant for each dimension ($p < 0.001$). Each dimension is significant for the explanation of patient satisfaction ($p < 0.001$) (Hair, Jr. et al., 2017).

Table 4
Coefficient of Determination R² of the model Analysis

	Original sample (0)	Sample Mean (M)	Bias	5%	95%
Satisfaction	0.781	n/a	n/a	0.412	1.328

Source: created by the authors

Table 4 shows that the R² of the model is 0.781, so the explained relation of the model is confirmatory (Hair et al., 2017). This indicates that the 6 dimensions impact patient satisfaction in the dental care clinics of the School of Dentistry of the Autonomous University of Coahuila.

Table 5 shows the results of the assessment method for discriminant validity according to the criterion established by Fornell and Larcker that takes each construct's square root of the AVE and compares it to the correlations with the other constructs. The root of the AVE must be greater than all the correlations with the other constructs and shown in the same column (Hair, Jr. et al., 2017). As can be seen in Table 5, all constructs meet the criterion.

Table 5
Discriminant validity according to the Fornell and Larcker criterion

	Responsiveness	Reliability	Empathy	Hygiene	Satisfaction	Safety	Tangibles
Responsiveness	0.8684						
Reliability	0.7227	0.8839					
Empathy	0.7193	0.8004	0.9076				
Hygiene	0.6229	0.6835	0.8777	0.9305			
Satisfaction	0.6949	0.6806	0.8151	0.7411	1.0000		
Safety	0.7434	0.7705	0.8159	0.8004	0.7824	0.8885	
Tangibles	0.4127	0.5678	0.6099	0.6801	0.4736	0.5750	0.8903

Source: created by the authors

Table 6
Summary of results with SmartPLS 4: PATH Analysis

	Hypothesis	PATH coefficient	Result
1	Tangible elements > Satisfaction	0.322	Accepted
2	Trust > Satisfaction	0.413	Accepted
3	Responsiveness > Satisfaction	0.652	Accepted
4	Safety > Satisfaction	0.527	Accepted
5	Empathy > Satisfaction	0.789	Accepted
6	Hygiene > Satisfaction	0.845	Accepted

Source: created by the authors

Table 6 shows the assessment of the model and the hypotheses based on the literature review. Subsequently, the research hypotheses are answered considering the results previously described:

H1 is accepted with $\beta=0.322$. Users are aware that tangible elements are key factors when receiving care, agreeing with Natalya Angela and Bawono Adisasmito (2019), who consider the image of the service provider as a prominent variable in patient satisfaction. It should be noted that in the Tangibility variable, a lower value is obtained relative to the other dimensions, agreeing with Morales Pando (2020): areas for improvement would focus on physical facilities, equipment, and promotional material for dental services.

Regarding the trust in the staff, H2 is accepted with $\beta=.413$, as patients perceive that treatment deadlines are met and that their health problems are attended to under quality conditions. This coincides with Sitaraman, Shanmugasundaram, and Muthukrishnan's (2020) findings that medical commitment is the most important factor in patient care. Similarly, H3 is accepted with $\beta=.652$ referring to responsiveness, with users opining on receiving prompt and efficient care. Regarding feeling safe with the services offered, H4 is accepted with $\beta=.527$ since the staff inspires trust as they have the necessary knowledge to resolve doubts.

H5 is also accepted with $\beta=.789$, as patients consider that doctors and students working in dental clinics are empathetic by having accessible prices and by their user-friendly services, agreeing with Matsumoto Nishizawa (2014) and Şantaş, Kar, Kahraman, and Kurşun (2016) that patients prefer to go to public hospitals because of the cost. Finally, H6 is also accepted with $\beta=.845$ since the interviewees state that they feel safe and satisfied with the precautionary measures during their care in the dental clinic, agreeing with Martínez-Camus and Yévenes-Huaiquino (2020) about the importance in the context of the pandemic of providing dental care seeking to reduce the risk of contagion between the patient and the dental health personnel.

Conclusions

It is important to recognize the School's social work in providing access to oral health care to vulnerable populations, preferably through its teaching-service model.

The results of this study show that users perceive a lag in the rehabilitation and maintenance of the service units, equipment, instruments, and supplies needed to provide quality service.

Some of the considerations to guarantee the improvement in the perception of the quality of the services provided by the School would be the following strategies from a Marketing perspective:

First, ensure the follow-up of the institution's patients by acquiring good software for efficient database management.

Moreover, given the serious challenges the Mexican economy is currently facing and noting that the public health budget is insufficient to meet the demand for services, it is suggested that services should continue to be offered at affordable prices.

After the pandemic, patients demand ongoing biosecurity protocols in dental practice.

On the other hand, an important point for users is ensuring the improvement of physical facilities and equipment, which can be carried out with the revenue obtained from services and by raising funds through sponsorships.

Another recommendation is to include quality service courses for professors and students in the curriculum and to continue incorporating the technology provided by the digital world into the dental practice to continue distinguishing itself nationally as a quality School.

Finally, the design and implementation of oral health promotion campaigns are recommended, such as “Free check-up week,” “The elderly and their oral health,” “Oral health and children,” “Guide to the most frequent oral diseases,” “Virtual and face-to-face courses,” “University tips for good oral hygiene,” among others.

The limitation of the present study was the small sample size, which limited conclusive results for the population that uses dental services at the School of Dentistry of the Autonomous University of Coahuila (Universidad Autónoma de Coahuila). The number of participants should be increased for a second phase of the project. Likewise, extending the survey to dental services offered by private universities and even to professional clinics is recommended to evaluate if the results behave similarly. This would be especially true for the hygiene construct since this element could vary significantly in the three contexts mentioned above.

It would be important to prove whether the hygiene construct maintains its importance in other service industries, such as the beauty industry (spas or beauty salons) or the food industry. If so, the addition of this construct could mean an improvement of the SERVPERF model for analyzing service quality in any type of industry.

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