Improving Patient Satisfaction Through Quality of Service for Diabetes Mellitus Wound Care Patients at Vera Cruz Community Health Center, Dili, Timor Leste

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Abstract: Diabetic wound care is a chronic health service that requires optimal service quality to ensure patient satisfaction. However, empirical studies on the relationship between service quality and patient satisfaction in the context of diabetic wound care in primary health care facilities in Timor Leste are still limited. This study aims to analyze the effect of service quality on patient satisfaction in diabetic wound care at the Vera Cruz Community Health Center in Dili, Timor Leste. This study used a quantitative approach with an explanatory design. The research instrument was adapted from the SERVQUAL model developed by Parasuraman. Data were analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS) to test the measurement and structural models. The results showed that service quality had a positive and significant effect on patient satisfaction. The resulting model met the validity and reliability criteria and had adequate explanatory power. These findings emphasize the importance of improving service quality, particularly in the aspects of reliability, responsiveness, and empathy, to increase patient satisfaction in chronic wound care services. This study contributes to enriching the literature on service quality and patient satisfaction in the context of primary health care in Timor Leste.

Keywords: Service Quality, Patient Satisfaction, Diabetic Wound Care.

INTRODUCTION

Diabetes mellitus is one of the fastest-growing chronic diseases worldwide and poses a major challenge to global health systems. A report by the International Diabetes Federation indicates that diabetic foot complications and chronic wounds are the leading causes of morbidity, recurrent hospitalizations, and non-traumatic amputations in patients with diabetes (Armstrong et al., 2017). Diabetic wounds not only increase healthcare costs but also significantly reduce patients' quality of life due to prolonged healing and the risk of recurrent infections (Zhang et al., 2017). Therefore, diabetic wound management requires continuous, responsive, and patient-centered care, particularly in primary healthcare facilities, which are at the forefront of chronic disease management.

From a service quality management perspective, service quality is understood as the gap between customer expectations and perceptions of the service received (Parasuraman et al., 1988). The SERVQUAL model developed by Parasuraman identifies five main dimensions: tangibles, reliability, responsiveness, assurance, and empathy. In the context of healthcare, service quality relates not only to clinical technical aspects but also to functional dimensions such as communication, empathy, and the speed of response of healthcare workers (Donabedian, 1988). Avedis Donabedian's structure–process–outcome model emphasizes that the quality of the service process has direct implications for patient outcomes, including satisfaction as an indicator of healthcare system performance.

Patient satisfaction is a multidimensional construct that reflects patients' cognitive and affective evaluations of their service experience (Oliver, 1980). In expectation-disconfirmation theory, satisfaction occurs when service performance meets or exceeds customer expectations. In the healthcare sector, patient satisfaction has been identified as an important determinant of loyalty, adherence to therapy, and continued service use (Kotler & Keller, 2016; Fatima et al., 2018). Empirical research consistently demonstrates a positive relationship between service quality and patient satisfaction across various healthcare services (Aliman & Mohamad, 2016; Prakash, 2010; Aagja & Garg, 2010).

However, most previous research has focused on general hospital services or inpatient care, while studies specifically addressing diabetic wound care at the primary healthcare level are relatively limited. This is despite the fact that diabetic wound care differs from acute medical care because it requires repeated visits, a long-term relationship between the patient and healthcare provider, and a high reliance on consistent care (Armstrong et al., 2017). In this context, dimensions such as empathy and responsiveness are thought to play a more dominant role than short-term curative care. Furthermore, most empirical studies have been conducted in countries with established healthcare systems, making the generalizability of findings to developing countries with limited resources less likely (Zarei et al., 2015).

Timor-Leste, a developing country with a growing primary healthcare system, faces challenges in improving service quality, particularly in chronic disease management. Primary healthcare facilities play a strategic role in providing continuous diabetic wound care. However, empirical evidence on how service quality affects patient satisfaction in the context of diabetic wound care in this country remains very limited in the international literature. This limitation indicates an underexplored contextual and empirical gap in the study of healthcare quality in the Southeast Asian region.

Based on the above description, this study aims to analyze the influence of service quality on patient satisfaction in diabetic wound care at the Vera Cruz Community Health Center in Dili, Timor Leste. This study provides a theoretical contribution by re-examining the relationship between service quality and patient satisfaction in the context of chronic wound care services in primary healthcare facilities in developing countries. Practically, the research findings are expected to serve as a basis for strengthening patient-centered service quality management strategies in chronic disease management.

METHOD

This study used a quantitative approach with an explanatory design to examine the effect of service quality on patient satisfaction in diabetic wound care. An explanatory design was chosen because this study aims to explain the causal relationships between variables based on established theoretical frameworks in the service quality management and service marketing literature (Hair et al., 2022). The quantitative approach allows for objective hypothesis testing through statistical analysis based on a structural model.

The study was conducted on diabetic wound care patients at the Vera Cruz Community Health Center in Dili, Timor Leste. The study population was all patients actively undergoing

diabetic wound care during the study period. The sampling technique used purposive sampling with the following inclusion criteria: (1) patients diagnosed with diabetes mellitus with chronic wound complications, (2) having undergone at least two treatment visits, and (3) willing to complete the questionnaire completely. The sample size was determined based on the recommendations of Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis, namely by multiplying the number of indicators by 5 to 10 respondents (Hair et al., 2022). This study used 28 indicators, so the minimum sample size required was 140 respondents (diabetes mellitus wound care patients).

Data were analyzed using a Partial Least Squares-based Structural Equation Modeling (PLS-SEM) approach with the help of SmartPLS software. The PLS-SEM method was chosen because it is suitable for research models that are predictive, moderate in complexity, and relatively small to medium sample sizes (Hair et al., 2022; Henseler et al., 2009). Model evaluation was carried out in two stages: testing the measurement model (outer model) and the structural model (inner model). The measurement model was evaluated through convergent validity tests (factor loading > 0.70; Average Variance Extracted/AVE > 0.50), construct reliability (Composite Reliability > 0.70), and discriminant validity using the HTMT (Heterotrait–Monotrait Ratio) criteria (Henseler et al., 2015). Meanwhile, the structural model was evaluated through the coefficient of determination (R^2), effect size (f^2), predictive relevance value (Q^2), and the significance of the relationship paths tested through a bootstrapping procedure with 5,000 subsamples (Hair et al., 2022).

This study consists of two variables: one exogenous variable (service quality) and one endogenous variable (patient satisfaction). The measurement indicators for each variable are shown in the following table.

Table 1. Operational Variables

Variable	Measurement	Indicator
X_Service Quality *Source: Parasuraman et al (1988)*	Tangibles (SQ1)	1. Modern clinical facilities, equipment, and resources
		2. Cleanliness and comfort of treatment rooms
		3. Professional appearance of healthcare workers
		4. Clear visual information/communication
	Reliability (SQ2)	5. Fulfilling service promises
		6. Accuracy and consistency of clinical procedures
		7. No repeated errors in care
		8. Accurate wound follow-up schedules
	Responsiveness (SQ3)	9. Speed of response to patient needs
		10. Timeliness of service
		11. Responsiveness to patient questions or complaints
	Assurance (SQ4)	12. Competence of healthcare workers
		13. Sense of safety and trust
		14. Clinic/facility credibility
		15. Compliance with medical standards
	Empathy (SQ5)	16. Individual attention to patient needs
		17. Effective communication and emotional support
		18. Patient-centric approach throughout the care process
Y_Patient Satisfaction *Soure: Friedel et al. (2023), Cui et al (2025), & Ferreira et al. (2023).*	Communication and Interaction (PS1)	19. Ability to explain conditions and treatments
		20. Politeness, attention, and communication skills
	Perception of the Service Process (PS2)	21. Timely service delivery
		22. Schedule certainty and clarity of care processes
		23. Problem handling and follow-up
	Perception of Facilities and Service Environment (PS3)	24. Cleanliness of the clinic/health center area
		25. Comfortable waiting/service area
		26. Adequate medical equipment

Variable	Measurement	Indicator
	Overall Satisfaction (PS4)	27. General assessment of the service received
		28. Re-approval to use the same service

RESULTS AND DISCUSSION
Respondent Profile

Respondent profile This study aims to provide an overview of the characteristics and demographics of the participants (respondents) involved in the study. The respondent profile in this study consists of gender, age, and highest level of education. To obtain an overview of the profile of the respondents included in this study, the following table presents the following information:

Table 2. Respondent Profile

No	Respondent Profile	Amount	Percentage (%)
1	**Gender**		
	Man	93	66.4
	Woman	47	33.6
2	**Age Group**		
	< 30 Years	8	5.7
	30 – 40 Years	41	29.3
	41 – 50 Years	71	50.7
	> 50 Years	20	14.3
3	**Education**		
	Senior High School	36	25.7
	Diploma	20	14.3
	Bachelor's degree	84	60

Source: Primary Data (2025)

Evaluation of the Measurement Model (Outer Model)

In data analysis using SmartPLS 3 software, the evaluation of the measurement model (outer model) was conducted by referring to three main criteria: convergent validity, discriminant validity, and composite reliability. Convergent validity testing on constructs measured by reflective indicators was carried out by assessing the magnitude of the correlation between the indicators and latent variables estimated using the PLS-SEM approach.

A reflective indicator is deemed to meet validity requirements if its loading factor value is above 0.70. This value indicates that the indicator has a strong contribution in representing the latent construct being measured. Therefore, this study sets a loading factor threshold of 0.70 as the indicator's eligibility criterion, as recommended in the PLS-SEM methodology literature (Hair et al., 2022; Ghozali & Latan, 2019).

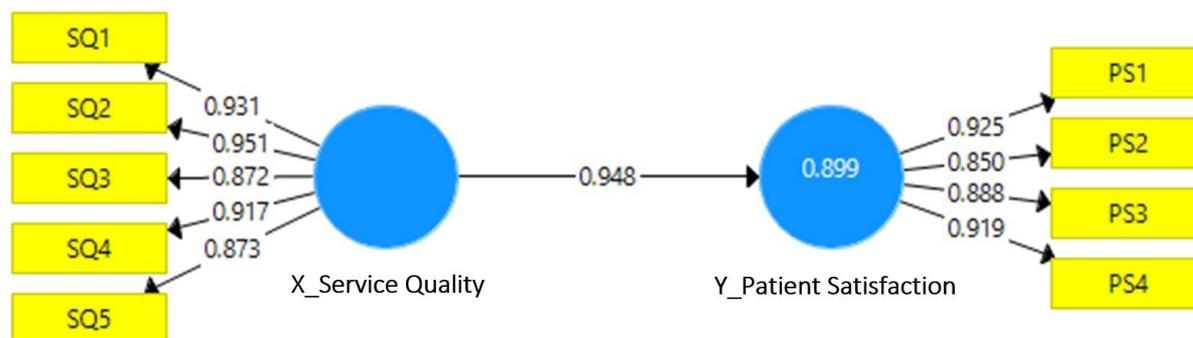Next, the results of the measurement model testing and data analysis are presented as follows.

Figure 1. Full Outer Model

Based on the results of data analysis using SmartPLS 3.0 shown in Figure 1, all indicators for each research variable showed outer loading values ranging from 0.850 (PS2) to 0.951 (SQ2). These values are above the recommended threshold of 0.70, thus concluding that all indicators for the Service Quality (X) and Patient Satisfaction (Y) variables meet convergent validity criteria.

This achievement indicates that each indicator has adequate capacity to reflect the latent construct being measured. Therefore, these indicators are considered to have a strong relationship with their respective latent variables, as recommended in the PLS-SEM measurement model evaluation guidelines (Hair et al., 2019).

Structural Model Test Results (Inner Model)

Once the measurement model has been determined to meet the established criteria, the next step is to assess the structural model. Structural model evaluation is performed by analyzing the coefficient of determination (R-square) to measure the ability of the exogenous constructs to explain the variance of the endogenous constructs. Furthermore, the analysis also includes calculating the effect size using the F-square (f^2) value to identify the contribution of each construct to the structural model.

a. R–Square value (Coefficient of determination)

The coefficient of determination (R-square) analysis was conducted to evaluate the research model's ability to explain the variance of the endogenous constructs studied. Through this test, the exogenous constructs are expected to have adequate predictive power against the endogenous variables so that the model can be assessed as having a good level of feasibility. In general, an R-square value of 0.75 indicates a strong level of explanation, a value of 0.50 indicates a moderate level of explanation, while a value of 0.25 reflects a relatively low level of explanation (Ghozali & Latan, 2015). Details of the results of the coefficient of determination test are presented in Table 3 below.

Table 3. R-Square Test Results

	R Square	Adjusted R Square
Y_Patient Satisfaction	0.899	0.899

Source: SmartPLS Output 3, 2025.

Based on the results of the determination coefficient (R-Square) test in Table 3, the Patient Satisfaction variable (Y_Patient Satisfaction) obtained an R-Square value of 0.899 with an Adjusted R-Square value of 0.899. This value indicates that the service quality variable as an exogenous construct is able to explain 89.9% of the variation that occurs in

patient satisfaction. Meanwhile, the remaining 10.1% is influenced by other factors outside the research model that are not analyzed in this study.

Referring to the structural model evaluation criteria in the PLS-SEM approach, an R-Square value above 0.75 is categorized as strong or having high explanatory power. Thus, the research model constructed has excellent predictive ability in explaining patient satisfaction based on service quality. Furthermore, the similarity between the R-Square and Adjusted R-Square values indicates that the model used is stable and not biased due to the number of predictors in the model. This finding confirms that service quality is a major determinant in shaping patient satisfaction in diabetes mellitus wound care services at the primary healthcare facility studied.

b. F–Square Value (f2 Effect Size)

The F-Square (f^2) test is conducted to evaluate the contribution of each exogenous construct to the endogenous variables in the structural model. This analysis is performed by comparing changes in R-Square values when a particular construct is eliminated from the model, thus determining the extent to which the construct influences the dependent variable.

Based on the PLS-SEM evaluation guidelines proposed by Hair et al. (2022), an effect size value below 0.02 indicates that the construct has no significant influence. Generally, an F-square value of 0.02 is categorized as a small influence, 0.15 as a medium influence, and 0.35 as a large influence. The results of the F-square calculation in this study are presented in the following table.

Table 4. F-Square Test Results

	Y_Patients Satisfaction
X_Service Quality	0.631

Source: SmartPLS Output 3, 2025.

Based on the results of the F-Square (f^2) test in Table 4, the variable X_Service Quality against Y_Patients Satisfaction obtained a value of 0.631. Referring to the effect size evaluation criteria in the PLS-SEM approach, the f^2 value of 0.631 indicates that service quality has a very large effect size on patient satisfaction. This value indicates that the existence of the service quality construct in the model makes a substantial contribution to increasing the predictive ability of the patient satisfaction variable. If the service quality construct is removed from the model, there will be a significant decrease in the coefficient of determination (R-Square) value of patient satisfaction. This finding emphasizes that service quality is the main determinant in shaping patient satisfaction in diabetes mellitus wound care services at the primary health care facility studied.

Hypothesis Testing Results and Discussion
Hypothesis testing

Structural model evaluation was conducted to analyze the causal relationships between constructs formulated in the study. This testing was carried out through a bootstrapping procedure after all indicators that did not meet validity requirements were eliminated from the measurement model. In structural model analysis, the significance of the path coefficients was determined based on the p-value. The relationship between latent variables was declared to have a positive and significant influence if the p-value was below the 0.05 significance level ($\alpha = 5\%$), so the proposed hypothesis was accepted. Conversely, if the p-value exceeded 0.05, the relationship between constructs was considered statistically insignificant. A

summary of the results of the structural model testing is presented in Figure 2 and Table 5 below.
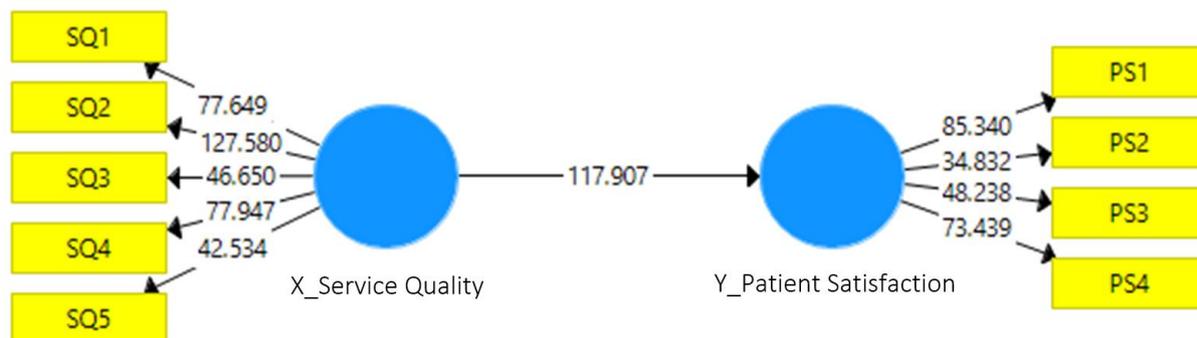

Figure 2. Research Construct Relationship Model Using the Bootstrapping Method

Table 6. Direct and Indirect Influence

Hypothesis	Latent Variables	Original Sample (O)	T Statistics	P Value	Results
H1	SQ ☐ PS	0.948	117,907	0,000	Accepted

Note: SQ = Service Quality; PS = Patient Satisfaction
Source: Smart PLS Output 3, 2025.

Discussion

The results of the hypothesis testing indicate that service quality has a positive and significant effect on patient satisfaction, with a path coefficient of 0.948 and a p-value <0.05. This coefficient indicates a very strong relationship, thus confirming that a substantial increase in service quality will increase patient satisfaction levels. This finding demonstrates that service quality is not merely a supporting factor, but rather a primary determinant in shaping patients' affective evaluations of the healthcare services they receive.

Conceptually, the results of this study are consistent with the SERVQUAL model developed by A. Parasuraman, Valarie A. Zeithaml, and Leonard L. Berry. This model emphasizes that service quality is perceived through five main dimensions: tangibles, reliability, responsiveness, assurance, and empathy. In the context of healthcare services, these dimensions have very concrete implications: the reliability of medical personnel in providing diagnoses, responsiveness to patient complaints, assurance of professional competence, empathy in therapeutic communication, and the condition of the physical facilities. If these five dimensions are optimally fulfilled, the perception of quality will increase and have a direct impact on patient satisfaction.

Furthermore, these findings can be explained through the expectation-confirmation theory proposed by Richard L. Oliver. This theory states that satisfaction is the result of evaluating the match between initial expectations and actual service performance. In healthcare, patients typically have high expectations for professionalism, safety, and personal attention. When service performance meets or exceeds these expectations, positive disconfirmation occurs, resulting in satisfaction. The very large influence coefficient in this study indicates that perceived service quality directly shapes patients' final evaluations of the service experience.

From a quality management theory perspective, these findings align with the principles of Total Quality Management (TQM) in public services, which emphasizes customer focus as a key pillar of organizational quality improvement. In the healthcare sector, the quality approach encompasses not only technical clinical aspects but also functional quality, as

explained in Christian Grönroos's service quality model. Technical quality relates to the medical outcomes patients receive, while functional quality refers to how the service is delivered. The combination of these two aspects determines patients' overall perception of healthcare services.

Empirically, the results of this study corroborate various previous studies. Research by Mohammad Ali et al. (2017) found that service quality significantly influences patient satisfaction and loyalty in hospitals. Similarly, a study by Sumaedi et al. (2016) showed that perceptions of reliability and empathy were the main predictors of patient satisfaction in public hospitals. Another study by Rita Andaleeb (2001) also confirmed that the quality of interactions between healthcare workers and patients is a dominant factor in shaping satisfaction in the healthcare sector.

Even in the context of healthcare services in developing countries, various studies have shown that service quality has a stronger influence than price or accessibility. This is due to increasing public awareness of the right to quality healthcare. Therefore, the influence coefficient of 0.948 in this study demonstrates consistency with global empirical trends that place service quality as a central variable in patient satisfaction models.

Furthermore, the very strong correlation in this study indicates that the service quality variable has a dominant predictive power on patient satisfaction in the service context studied. This can be interpreted as meaning that patients place more emphasis on the overall service experience than other external factors. Therefore, service quality improvement strategies—such as interpersonal communication training for healthcare workers, standardization of operational procedures, improvements to physical facilities, and strengthening a culture of excellent service—are strategic steps to maintain and improve patient satisfaction.

Overall, both conceptually and empirically, the results of this study strengthen the argument that service quality is a primary antecedent of patient satisfaction. The contribution of this study lies in strengthening the empirical evidence in the context of the specific healthcare service studied, while also providing practical implications for healthcare managers to prioritize improving service quality as a primary strategy for enhancing satisfaction and the sustainability of healthcare organizations.

CONCLUSION

This study demonstrates that service quality has a positive and significant impact on patient satisfaction. The better patients perceive the quality of service they receive, the higher their perceived level of satisfaction. These results confirm that service quality is a key factor in shaping patient satisfaction with the healthcare services studied. Therefore, improving service quality is a key strategy that healthcare managers should prioritize.

This study has several limitations. First, the research model uses only one independent variable, thus failing to capture other factors that could potentially influence patient satisfaction. Second, the study was conducted in a specific service context, so generalization of the results requires caution. Third, the cross-sectional study design is not capable of capturing long-term changes in patient perceptions.

Future research is recommended to develop a more comprehensive model by adding other variables such as trust, loyalty, or perceived value. Furthermore, expanding the research sample to various types of healthcare facilities and using longitudinal or mixed-method designs could provide a deeper understanding of the factors influencing patient satisfaction.

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