Global Management: International Journal of Management Science and Entrepreneurship

E-ISSN: 3063-6256
P-ISSN: 3048-4170

(Research/Review) Article

The Influence of Multidimensional Service Quality, Perceived Value, and Customer Relationship Management on Customer Satisfaction: The Mediating Role of Customer Engagement at Awal Care Veterinary Clinic

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Abstract: This study aims to analyze the influence of Multidimensional Service Quality, Perceived Value, and Customer Relationship Management (CRM) on Customer Satisfaction, with Customer Engagement as a mediating variable at Awal Care Veterinary Clinic in East Jakarta. The research background is driven by a significant decline in patient numbers in 2023 and intense competition in the veterinary healthcare sector. This study employs a quantitative correlational approach using purposive sampling, involving 310 respondents who are clients of the clinic. Data were collected through a questionnaire with a 6-point Likert scale, and analyzed using the Structural Equation Modeling Partial Least Squares (SEM-PLS) method. The results indicate that all independent variables service quality, perceived value, and CRM—have a positive and significant influence on both customer engagement and customer satisfaction. Customer engagement is also found to have a significant impact on customer satisfaction. Furthermore, all indirect relationships through the mediation of customer engagement are significant, indicating that customer engagement serves as an important partial mediator. The R^2 value of 0.646 demonstrates that the model has strong predictive power for customer satisfaction. These findings highlight the importance of strengthening experience-based strategies and fostering emotional and cognitive connections with customers. This study contributes theoretically to the field of service marketing and provides practical implications for veterinary clinic management in enhancing customer satisfaction and loyalty.

Keywords: Customer Engagement; Customer Relationship Management; Customer Satisfaction; Multidimensional Service Quality; Perceived Value.

Received : July 12 2025
Revised : July 23 2025
Accepted : August 29, 2025
Published : September 11, 2025
Current Ver.: September 11 28, 2025

1. Introduction

This research was conducted at Awal Care Veterinary Clinic, located in Duren Sawit District, East Jakarta. The study falls within the scope of marketing management, particularly in relation to customer satisfaction as a crucial aspect in sustaining business continuity. In this context, the researcher addresses a marketing problem from the perspective of customer satisfaction, which serves as a key indicator in building long-term relationships between consumers and service providers. Customer satisfaction is defined as the feeling of pleasure or disappointment that arises from comparing one's perception of service performance with initial expectations. A high level of customer satisfaction encourages loyalty and fosters the sustainability of the relationship between customers and service providers [1].

The increasingly pet-conscious lifestyle of today's urban society has positioned veterinary healthcare services as a primary necessity. Veterinary clinics now offer not only medical treatments but also comprehensive care such as surgery, vaccination, dental and oral care, boarding services, and even home visits. Awal Care Veterinary Clinic, established in 2014 in Bekasi, has since expanded to four branches across Jakarta and Bekasi. However, according to Awal Care's internal data, the number of patients declined from 30,908 in 2022 to 25,462

in 2023. This sharp decrease of 5,446 patients reflects the intense competition within the veterinary healthcare industry in Jakarta and its surrounding areas.

The competitive landscape is further illustrated by the 2022 Activity Report of the Ministry of Agriculture, which notes the presence of 184 pet shops and 67 veterinary clinics/veterinarians in the DKI Jakarta area, with the highest concentration found in East Jakarta [2]. Consumers can now easily compare clinic services through social media and online reviews, making service quality a primary factor in retaining customers. Consequently, veterinary clinic management must consistently deliver superior services, encompassing not only service quality but also perceived value and the effectiveness of customer relationship management (CRM).

This study specifically examines three main factors presumed to influence customer satisfaction: multidimensional service quality (including tangibles, reliability, responsiveness, assurance, and empathy), perceived customer value, and customer relationship management (CRM). Furthermore, the research introduces customer engagement as a mediating variable, representing the extent to which customers are affectively and cognitively involved in their interactions with the clinic. Through this approach, the study aims to provide a more comprehensive understanding of how various marketing factors simultaneously contribute to shaping customer satisfaction in veterinary clinic services.

2. Preliminaries or Related Work or Literature Review

Based on previous research, several variables have been identified as influencing customer satisfaction (CS), including Multidimensional Service Quality, Customer Perceived Value, and Customer Relationship Management (CRM). These three variables have been extensively examined in marketing management studies and have been shown to contribute to the development of customer loyalty and satisfaction, particularly in the service sector. However, the role of customers' emotional and behavioral involvement—known as customer engagement as a mediating variable remains relatively underexplored in the context of veterinary clinics.

Service quality is defined as the ability of a service provider to consistently meet customer needs and expectations. The SERVQUAL model classifies service quality into five main dimensions: tangibles, reliability, responsiveness, assurance, and empathy [3]. Multidimensional service quality is highly relevant in the service sector, including veterinary healthcare, as each dimension contributes to delivering a holistic customer experience [4]. Several studies have stated that service quality has a positive and significant impact on customer satisfaction [5], although some findings indicate that this influence is only significant through mediation, such as customer trust or engagement (Abror, 2020). This suggests a remaining gap in examining this relationship with customer engagement as a mediator.

Perceived value refers to a customer's assessment of the relative benefits of a product or service compared to the costs incurred (Samudro et al., 2020; Blut et al., 2024). In the context of veterinary healthcare services, perceived value is particularly important as customers compare price, service quality, and the convenience of care. A strong perceived value can enhance repurchase decisions and customer satisfaction [6]. However, several studies have found that the influence of perceived value on customer satisfaction may depend on customers' psychological and affective conditions, such as engagement or trust [7], [8]. Therefore, incorporating customer engagement as a mediating variable in this relationship is both theoretically and empirically relevant.

CRM is a strategic approach used by organizations to systematically manage customer interactions in order to improve loyalty, retention, and satisfaction [9]. An effective CRM system enables service providers to build personal relationships, proactively respond to customer needs, and create memorable experiences. In the context of veterinary clinics, CRM can include vaccination reminders, post-service follow-ups, and regular communication to strengthen positive customer perceptions [10]. Previous research has shown that CRM positively influences customer satisfaction both directly and through mediating variables such as trust or engagement [11], [12].

Customer engagement represents the affective, cognitive, and behavioral involvement of customers in their interactions with service providers [13]. In modern marketing studies, engagement is positioned as a crucial link between customer experience and outcomes such as satisfaction and loyalty. Engagement reflects the depth of the relationship between the customer and the service provider, and it is considered an important predictor of the success

of both CRM initiatives and service experiences [13]. Several studies have confirmed that engagement can serve as a mediating variable in the relationship between service quality or CRM and customer satisfaction [14], [15]. However, in the context of veterinary clinics, few studies have explicitly examined this mediating role.

Customer satisfaction is an evaluative response to the consumption experience and plays a critical role in shaping loyalty and repeat purchase behavior (Khan, Salamzadeh et al., 2007). In veterinary healthcare services, satisfaction can be influenced by the professionalism of medical staff, the comfort of facilities, communication quality, and the level of care for pets. When customers are satisfied, they are more likely to make repeat visits and recommend the services to others. Several studies have shown that service quality, perceived value, and CRM all influence customer satisfaction, either directly or through intermediary variables such as trust or engagement [16], [17], [18].

Based on previous research, there remains a gap in understanding how customer engagement serves as a bridge between service quality, perceived value, and CRM in influencing customer satisfaction, particularly in the veterinary clinic sector. While some studies have demonstrated direct effects, few have explicitly tested mediation within the multidimensional context of veterinary healthcare services. The novelty of this study lies in the use of the SEM-PLS model with customer engagement as a single mediating variable. Furthermore, the multidimensional approach to service quality (using SERVQUAL) offers richer analytical depth in exploring the relationships among the variables.

3. Proposed Method

The research employed a quantitative correlational approach, which aims to examine the statistical relationships between variables (Creswell, 2014). The study was conducted at Awal Care Veterinary Clinic, a veterinary healthcare service located in Duren Sawit District, East Jakarta. From a time perspective, this research is cross-sectional in nature, meaning that data collection was carried out once in 2025 without tracking changes over time. The population consisted of all customers of Awal Care Veterinary Clinic, whose exact number is unknown; therefore, a non-probability sampling technique was applied, specifically purposive sampling. The respondent criteria were customers who had used the services of Awal Care Veterinary Clinic within the last two months, whether for outpatient care, vaccination, or veterinary medical consultation.

A total of 310 respondents were included in this study. This sample size is considered adequate for the analysis model employed, namely Partial Least Squares–Structural Equation Modeling (PLS-SEM). According to Hair et al. (2019), the minimum sample size for a PLS-SEM model should be at least ten times the number of indicators used. In this study, there were 31 indicators, resulting in a minimum required sample size of $10 \times 31 = 310$ respondents. Data were collected through a survey method by distributing questionnaires. The research instrument comprised statements representing five main constructs: Multidimensional Service Quality, Perceived Value, Customer Relationship Management (CRM), Customer Engagement, and Customer Satisfaction. Each item was measured using a 6-point Likert scale, ranging from 1 = Strongly Disagree to 6 = Strongly Agree, to avoid the neutral midpoint bias and encourage respondents to make clearer choices in their attitudes. Hypothesis testing was conducted using the Structural Equation Modeling (SEM) approach with SmartPLS 3.0 software. PLS-SEM is a variance-based (component-based) approach that is particularly suitable for predictive research, especially when the sample size is relatively small, and the research model is complex [19].

Formatting of Mathematical Components

The primary data collection technique in this study employed a survey method using a questionnaire instrument constructed with an ordinal scale, specifically a 6-point Likert scale (1 = Strongly Disagree, 6 = Strongly Agree) to measure respondents' perceptions of the variables under investigation [20], [21]. The instrument was tested through Confirmatory Factor Analysis (CFA) to assess construct validity, and reliability testing was performed using Cronbach's Alpha values. Data analysis techniques included both descriptive analysis and verification analysis using the Structural Equation Modeling–Partial Least Squares (SEM–PLS) approach [Hair et al., 2019].

The research model used in this study consists of two sub-structures, involving exogenous (independent) variables: Multidimensional Service Quality (ξ_1), Perceived Value (ξ_2), and Customer Relationship Management (ξ_3); the mediating variable: Customer Engagement (η_1); and the endogenous (dependent) variable: Customer Satisfaction (η_2). Structural Equation 1 (Direct effect of exogenous variables on the mediator):

$$\eta_1 = \gamma_0 + \gamma_1 \cdot \xi_1 + \gamma_2 \cdot \xi_2 + \gamma_3 \cdot \xi_3 + \varepsilon_1$$

Where:
η_1 = Customer Engagement (mediating variable)
ξ_1 = Multidimensional Service Quality
ξ_2 = Perceived Value
ξ_3 = Customer Relationship Management (CRM)
γ_0 = Constant
$\gamma_1, \gamma_2, \gamma_3$ = Coefficients representing the effect of each exogenous variable on customer engagement
ε_1 = Error term for sub-structure 1

Structural Equation 2 (Direct and indirect effects on customer satisfaction):

$$\eta_2 = \gamma_0 + \gamma_4 \cdot \xi_1 + \gamma_5 \cdot \xi_2 + \gamma_6 \cdot \xi_3 + \gamma_7 \cdot \eta_1 + \varepsilon_2$$

Where:
η_2 = Customer Satisfaction (dependent variable)
ξ_1 = Multidimensional Service Quality
ξ_2 = Perceived Value
ξ_3 = Customer Relationship Management (CRM)
η_1 = Customer Engagement (mediating variable)
$\gamma_4, \gamma_5, \gamma_6$ = Coefficients representing the direct effect of each exogenous variable on customer satisfaction
γ_7 = Coefficient representing the effect of customer engagement on customer satisfaction
ε_2 = Error term for sub-structure 2

Using this approach, the direct and indirect relationships of the three independent variables on customer satisfaction through customer engagement are analyzed simultaneously. Estimation is carried out using the PLS algorithm, and the significance of the results is tested through bootstrapping.

4. Results and Discussion

Before testing the hypotheses, an outer model test and an inner model test were first conducted. The results of the outer model test are presented below. First, the results of the indicator reliability test are provided, as shown in the following table.

Table 1. Indicator Reliability Test with Outer Loadings Loadings.

Variabel	Indikator	Outer Loadings
Multidimensional Service Quality(X1)	KLM10	0.825
	KLM11	0.888
	KLM12	0.871
	KLM13	0.725
	KLM9	0.716
Perceived Value(X2)	PN1	0.876
	PN2	0.869
	PN3	0.858
	PN4	0.845
Customer Relationship Management (X3)	CRM1	0.901

	CRM2	0.914
	CRM3	0.898
	CRM4	0.898
	CE1	0.897
	CE2	0.872
Customer Engagement (Z)	CE3	0.841
	KP1	0.902
Customer Satisfaction(Y)	KP2	0.886
	KP3	0.874
	KP4	0.871

Research result (2023)

Based on Table 1, all outer loading values for each indicator are above 0.70, indicating that the indicators meet the requirement for convergent validity [22]. This result demonstrates that each indicator has a strong correlation with its respective construct and can be considered reliable in measuring the intended variable [23].

Table 2. Discriminant Validity Test Results with Cross-Loadings.

	Multidimensional Service Quality(X1)	Perceived Value(X2)	Customer Relationship Management (X3)	Customer Engagement (Z)	Customer Satisfaction(Y)
KLM10	0.449	0.367	0.378	0.522	0.825
KLM11	0.529	0.402	0.434	0.561	0.888
KLM12	0.52	0.391	0.434	0.528	0.871
KLM13	0.503	0.407	0.446	0.45	0.725
KLM9	0.446	0.424	0.431	0.423	0.716
PN1	0.552	0.876	0.596	0.425	0.37
PN2	0.573	0.869	0.576	0.469	0.468
PN3	0.562	0.858	0.6	0.412	0.447
PN4	0.516	0.845	0.612	0.343	0.402
CRM1	0.629	0.658	0.901	0.426	0.483
CRM2	0.667	0.654	0.914	0.482	0.484
CRM3	0.581	0.601	0.898	0.486	0.46
CRM4	0.599	0.576	0.898	0.446	0.465
CE1	0.632	0.534	0.579	0.897	0.561
CE2	0.566	0.411	0.403	0.872	0.492
CE3	0.545	0.292	0.327	0.841	0.559
KP1	0.902	0.565	0.608	0.564	0.494
KP2	0.886	0.558	0.614	0.622	0.511
KP3	0.874	0.494	0.536	0.637	0.587
KP4	0.871	0.64	0.663	0.546	0.551

The highest cross-loading value for each indicator is found in its original construct compared to other constructs. This indicates that each indicator better reflects its own variable than any other variable, thereby fulfilling the discriminant validity requirement [22], [24].

Table 3. Discriminant Validity Test Results with Fornell-Larcker.

Variabel	Customer Engagement (Z)	Customer Relationship Management (X3)	Customer Satisfaction(Y)	Multidimensional Service Quality(X1)	Perceived Value(X2)
Customer Engagement (Z)	0.87				
Customer Relationship Management (X3)	0.51	0.903			
Kepuasan Pelanggan	0.67	0.686	0.883		
Multidimensional Service Quality(X1)	0.618	0.524	0.607	0.808	
Perceived Value(X2)	0.481	0.69	0.64	0.491	0.862

Table 3 shows that the square root of the AVE (bold diagonal values) for each construct is greater than the correlations between that construct and the other constructs. This indicates that each construct demonstrates good discriminant validity, meaning that the indicators of one construct do not reflect other constructs [22], [24].

Table 4. Internal Consistency Test with Cronbach's Alpha and Composite Reliability.

Variabel	Cronbach's alpha	Composite reliability
Customer Engagement (Z)	0.84	0.849
Customer Relationship Management (X3)	0.924	0.926
Kepuasan Pelanggan	0.906	0.906
Multidimensional Service Quality(X1)	0.865	0.872
Perceived Value(X2)	0.885	0.888

All variables have Cronbach's Alpha and Composite Reliability values above 0.70, indicating that the constructs possess internal reliability and are suitable for use in structural model testing [25]. All VIF values are below 5, indicating that there is no multicollinearity issue among the independent variables in the model [22]. Therefore, the assumption of non-multicollinearity is fulfilled..

Tabel 5. Hasil Uji Multikolinieritas – VIF.

Variabel	Customer Engagement (Z)	Kepuasan Pelanggan
Multidimensional Service Quality(X1)	1.442	1.817
Perceived Value(X2)	1.996	2.028
Customer Relationship Management (X3)	2.09	2.146
Customer Engagement (Z)		1.78
Customer Satisfaction(Y)		

An R^2 value of 0.438 indicates that the independent variables (X_1, X_2, X_3) can explain 43.8% of the variance in Customer Engagement. Meanwhile, an R^2 value of 0.646 indicates that Customer Engagement, together with the three independent variables, can explain 64.6% of the variance in Customer Satisfaction, which falls into the strong category \[22].

Table 6. Coefficient of Determination (R^2) Results.

Variabel	R-square
Customer Engagement (Z)	0.438
Customer Satisfaction(Y)	0.646

Table 7. Effect Size (f^2) Test Results.

Variabel	Customer Engagement (Z)	Customer Satisfaction(Y)
Customer Engagement (Z)		0.171
Customer Relationship Management (X3)	0.027	0.121
Customer Satisfaction(Y)		
Multidimensional Service Quality(X1)	0.26	0.033
Perceived Value(X2)	0.016	0.056

Nilai f^2 menunjukkan efek kontribusi relatif dari setiap variabel terhadap konstruk dependen. Customer Engagement memberikan efek sedang terhadap Customer Satisfaction(f^2 = 0.171). Kualitas Layanan memiliki efek besar terhadap Customer Engagement (f^2 = 0.260), sedangkan variabel lainnya menunjukkan pengaruh kecil hingga sedang sesuai dengan interpretasi Cohen [26].

Tabel 8. Hasil Uji Predictive Relevance (Q^2).

Variabel	SSO	SSE	Q^2 (=1-SSE/SSO)
Customer Engagement (Z)	930	629.83	0.323
Customer Relationship Management (X3)	1240	1240	-
Customer Satisfaction(Y)	1240	623.762	0.497
Multidimensional Service Quality(X1)	1550	1550	-
Perceived Value(X2)	1240	1240	-

Nilai Q^2 untuk kedua variabel endogen lebih besar dari 0, yang menandakan bahwa model memiliki *predictive relevance* yang baik [22]. Secara khusus, Q^2 sebesar 0.497 untuk Customer Satisfactionmengindikasikan daya prediktif model berada pada kategori tinggi.

The results of the path coefficient are presented in Figure 1

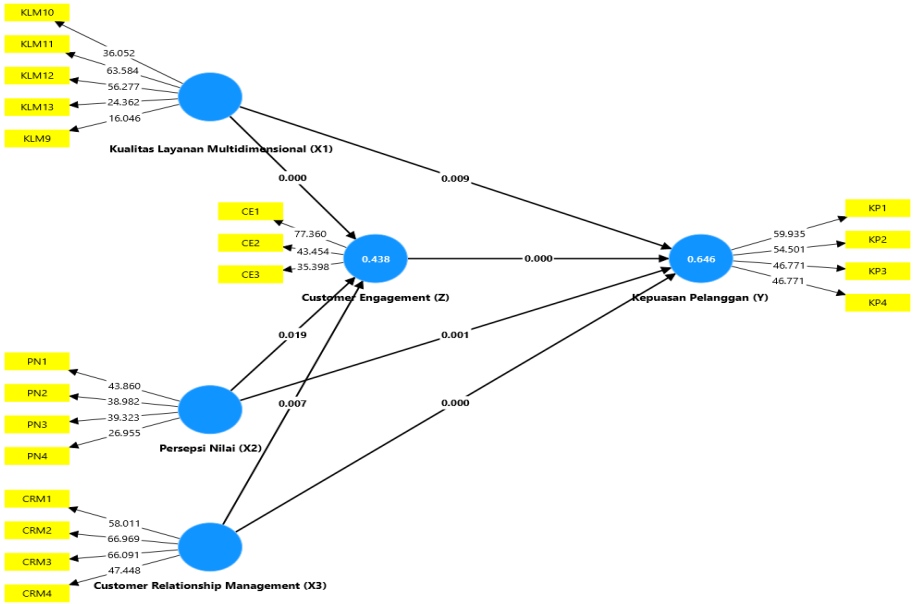

Figure 1. Path Coefficient Hypothesis Test Results.

Table 9. Hypothesis Test Results.

	Hipotesis	Path Coefficient Values	T statistics	P values
Direct Relationship				
H1	Multidimensional Service Quality (X1) -> Customer Engagement (Z)	0.459	8.359	0.000
H2	Multidimensional Service Quality(X1) -> Customer Satisfaction(Y)	0.147	2.628	0.009
H3	Perceived Value(X2) -> Customer Engagement (Z)	0.134	2.348	0.019
H4	Perceived Value(X2) -> Customer Satisfaction(Y)	0.2	3.465	0.001
H5	Customer Relationship Management (X3) -> Customer Engagement (Z)	0.177	2.699	0.007
H6	Customer Relationship Management (X3) -> Customer Satisfaction(Y)	0.304	4.936	0.000
H7	Customer Engagement (Z) -> Customer Satisfaction(Y)	0.328	5.19	0.000
Indirect Relationship				
H8	Multidimensional Service Quality(X1) -> Customer Engagement (Z) -> Customer Satisfaction(Y)	0.151	4.417	0.000
H9	Perceived Value(X2) -> Customer Engagement (Z) -> Customer Satisfaction(Y)	0.044	2.06	0.039
H10	Customer Relationship Management (X3) -> Customer Engagement (Z) -> Customer Satisfaction(Y)	0.058	2.337	0.019

5. Comparison

Based on the results of the path analysis presented in Table 9, the following are the findings and interpretations for each hypothesis, covering both direct effects (H1–H7) and indirect effects through the mediating variable Customer Engagement (H8–H10).

Effect of Multidimensional Service Quality on Customer Engagement

The results show that Multidimensional Service Quality (X_1) has a positive and significant effect on Customer Engagement (Z), with a coefficient value of 0.459, a t-statistic of 8.359 (>1.96), and a p-value of 0.000 (<0.05). Thus, H1 is accepted. This finding aligns

with the SERVQUAL theory [27] and is supported by Alsaggaf et al. [28], who state that high service quality can enhance customers' emotional and cognitive engagement with the service.

Effect of Multidimensional Service Quality on Customer Satisfaction

Multidimensional Service Quality also has a positive and significant effect on Customer Satisfaction, with a coefficient value of 0.147, a t-statistic of 2.628, and a p-value of 0.009. Therefore, H2 is accepted. This finding reinforces previous studies such as Wulandari [29] and Naini et al. [30], which suggest that the better the service received by customers, the higher their satisfaction.

Effect of Perceived Value on Customer Engagement

The results indicate a coefficient value of 0.134, a t-statistic of 2.348, and a p-value of 0.019, signifying a positive and significant effect. Thus, H3 is accepted. This finding is consistent with the studies of Yum & Kim [7] and Yan et al. [31], which explain that a high perceived value of a service can enhance customer engagement in long-term relationships.

Effect of Perceived Value on Customer Satisfaction

Perceived Value has a positive and significant effect on Customer Satisfaction, with a coefficient value of 0.200, a t-statistic of 3.465, and a p-value of 0.001. Therefore, H4 is accepted. This supports the findings of Olivia & Bernarto [32] and Chelsea [33], who assert that customers who perceive benefits to be commensurate with service costs tend to be more satisfied.

Effect of CRM on Customer Engagement

Customer Relationship Management (CRM) has a positive and significant effect on Customer Engagement, with a coefficient value of 0.177, a t-statistic of 2.699, and a p-value of 0.007. Thus, H5 is accepted. This result is consistent with the theory proposed by Hyun & Perdue [34], which emphasizes the importance of sustained relationships in fostering customer engagement.

Effect of CRM on Customer Satisfaction

With a coefficient value of 0.304, a t-statistic of 4.936, and a p-value of 0.000, CRM is shown to have a significant effect on Customer Satisfaction. Therefore, H6 is accepted. This finding strengthens the results of studies by Khan et al. [11] and Sofi et al. [35], which highlight that personal interaction and post-service attention can enhance satisfaction.

Effect of Customer Engagement on Customer Satisfaction

Customer Engagement has a positive and significant effect on Customer Satisfaction, with a coefficient value of 0.328, a t-statistic of 5.190, and a p-value of 0.000. Thus, H7 is accepted. This result is in line with the theory of Hollebeek et al. [36], which posits that customer engagement plays a central role in shaping a satisfying experience.

Indirect Effect of Service Quality on Satisfaction through Customer Engagement

The results indicate a significant indirect effect of Service Quality on Satisfaction through Customer Engagement, with a coefficient value of 0.151, a t-statistic of 4.417, and a p-value of 0.000. Since the p-value is <0.05 and the effect is significant, H8 is accepted. This indicates that part of the effect of service quality on satisfaction is mediated by customer engagement (partial mediation, VAF between 20–80%).

Indirect Effect of Perceived Value on Satisfaction through Customer Engagement

There is a significant indirect effect of Perceived Value on Customer Satisfaction through Customer Engagement, with a coefficient value of 0.044, a t-statistic of 2.060, and a p-value of 0.039. Since the p-value is <0.05, H9 is accepted. This suggests that customer

engagement serves as an important mediating pathway in shaping the impact of perceived value on satisfaction.

Indirect Effect of CRM on Satisfaction through Customer Engagement

The results show that CRM has a significant indirect effect on Satisfaction through Customer Engagement, with a coefficient value of 0.058, a t-statistic of 2.337, and a p-value of 0.019. Therefore, H10 is accepted. This finding supports the argument that effective CRM fosters customer engagement, which in turn enhances satisfaction [37], [38].

6. Conclusions

Based on the research findings, all proposed hypotheses, both direct and indirect, were found to be significant, providing strong support for the proposed conceptual model. Customer engagement emerged as an important partial mediating factor in bridging the influence of service quality, perceived value, and Customer Relationship Management on customer satisfaction. This mediating role indicates that customer satisfaction is not only influenced by the quality of interactions and the perceived value directly, but also by the extent to which customers feel emotionally and cognitively engaged with the services provided. These findings serve as a crucial foundation for developing more personalized, consistent, and memorable relationship-based and experience-driven marketing strategies, thereby fostering stronger bonds between the veterinary clinic and its customers amid the increasingly competitive industry landscape.

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