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Analysis of Customer Preferences in Choosing Animal Health Care Facilities in The City of Surabaya Using Conjoint Analysis

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Abstract
The increasing number of pet owners in Surabaya City has intensified the demand for high-quality animal healthcare services; however, quantitative studies examining the service attributes that most influence customer preferences remain limited. This study aimed to identify the service attributes that most influenced customers' decisions when selecting animal healthcare facilities in Surabaya City and to analyze the influence and relationship of demographic factors on these preferences. This study employed a conjoint analysis method involving 392 respondents. The analysis was further supported by ordinal logistic regression and Spearman and Kendall's Tau correlation tests. The results showed that price was the most influential attribute, with a relative importance value of 52.227%, followed by service location (15.511%) and operational hours (12.757%). Other attributes, including additional facilities, veterinarian experience, and diagnostic facilities, demonstrated relatively lower levels of importance. Demographic analysis revealed that income had a consistent influence on and relationship with customer preferences, whereas age and gender did not demonstrate significant effects or relationships with customer preferences. The findings suggest that animal healthcare service providers in Surabaya City should prioritize pricing strategies and location accessibility to improve competitiveness and meet customer expectations.

INTRODUCTION

The development of the animal healthcare sector in Indonesia has accelerated in recent years. This sector has received increasing attention as pet ownership continues to grow, particularly among urban populations. Pets, especially cats and dogs, are no longer viewed merely as household companions or sources of entertainment but have become considered part of the family. This phenomenon reflects a shift in customer behavior from simple pet ownership toward pet parenting, characterized by increasing awareness among owners regarding the provision of healthcare, nutrition, and psychological well-being for animals. According to Kotler and Keller (2025), customer behavior is influenced by cultural, social, personal, and psychological factors.

A survey conducted by JakPat (2023) showed that 42% of Indonesian respondents owned two to three pets. Another survey by Mordor Intelligence (2022) further indicated that approximately 47% of Indonesians owned pets. These findings suggest that pet owners have sufficient purchasing capacity to fulfill their animals' needs. Firman et al. (2023) reported that 38% of respondents spent between IDR 250,000 and IDR 700,000 per month on pet-related needs, including routine veterinary check-ups, vaccinations, and other healthcare services. This

trend indicates a shift in consumption patterns from basic maintenance toward more comprehensive animal healthcare needs (Van Boeckel et al. 2019; Caudell et al. 2019).

Surabaya City is the second-largest city in Indonesia, with a population of 3.02 million people, including 2.1 million individuals aged over 18 years (Central Statistics Agency of Surabaya City, 2025). The high level of urbanization and increasing awareness of animal welfare make Surabaya a strategic location for examining customer behavior in selecting animal healthcare service units. The city provides various animal healthcare facilities, ranging from the Animal Health Center (Pusat Kesehatan Hewan/Puskeswan) managed by the Surabaya Department of Food Security and Agriculture (Dinas Ketahanan Pangan dan Pertanian/DKPP), the Teaching Animal Hospital of Airlangga University, the Teaching Animal Hospital of Wijaya Kusuma University, to private veterinary clinics offering diverse services and pricing structures.

Although demand for animal healthcare services in Surabaya is increasing, limited research has examined how specific elements of the marketing mix (product, price, place, and promotion) influence customer preferences. Service providers continue to face challenges in determining service standards and pricing strategies that align with market expectations. This condition has resulted in considerable variation among providers in terms of service costs, facilities, and quality.

To examine customer preferences in selecting animal healthcare facilities, conjoint analysis can be applied as a method for identifying the relative importance of service attributes. Previous studies have applied conjoint analysis in various healthcare contexts (Al-Omari et al., 2022; Lee et al., 2025; Zheng et al., 2023; Liu et al., 2024). However, research examining the attributes of animal healthcare services that influence customer preferences remains limited. Bardhan et al. (2020) considered attributes such as service location, distance, drug availability, and medical personnel but did not include other relevant attributes, including price, veterinarian experience, diagnostic facilities, and additional services. Therefore, this study aimed to (1) identify differences in customer preference levels among attributes representing the marketing mix in selecting animal healthcare service units in Surabaya City and (2) determine whether demographic factors (gender, age, and monthly income) significantly influenced and were associated with customer decision-making.

Customer behavior refers to the study of how individuals, groups, or organizations select, purchase, use, and evaluate products, services, ideas, or experiences to satisfy their needs and desires (Solomon, 2020). According to Kotler et al. (2018), customer behavior is influenced by marketing stimuli, including the marketing mix (4P: product, price, place, and promotion), which shapes customer characteristics and decision-making processes. In addition to marketing stimuli, purchasing decisions are influenced by cultural, social, personal, and psychological factors.

Understanding customer preferences plays an important role in ensuring that service decisions align with customer expectations. Knowledge of customer preferences and behaviors provides an essential foundation for planning, developing, and marketing products or services effectively (Hasan et al., 2022). Yawan et al. (2024) found that service quality and pricing strategies significantly influence the formation of customer preferences. Furthermore, facility quality, equipment availability, and environmental comfort also contribute significantly to customer evaluations (Widodo & Sari, 2022).

Attribute-Based Decision Theory (ABDT), introduced by Lancaster (1966), proposes that customers derive utility not directly from products or services but from the attributes embedded within them. Based on marketing mix theory (Kotler et al., 2018; Lovelock & Wirtz, 2016), product attributes in this study were represented by diagnostic facilities (microscopes, blood tests, ultrasound, and X-rays) and additional services (home visits, grooming, and veterinary care). Price attributes were represented by consultation and examination fees. Place attributes were represented by service location and operating hours, while promotion attributes were represented by veterinarian experience (Soekhai et al., 2019; Asmara & Triwardhani, 2023).

The novelty of this research lies in several aspects. First, this study provides a comprehensive application of conjoint analysis to examine customer preferences for animal healthcare service units in Surabaya, Indonesia, addressing a gap in veterinary service marketing literature. Second, the study integrates the marketing mix (4P: product, price, place, and promotion) framework with Attribute-Based Decision Theory (Lancaster, 1966) to decompose customer preferences into part-worth utility values for specific service attributes. Third, this research examines the influence and relationship of demographic factors (gender, age, and monthly income) on customer preferences using ordinal logistic regression and correlation tests, providing insights into how different customer segments evaluate service attributes. Fourth, the study identifies the relative importance of six service attributes—consultation and examination prices, service location, veterinarian experience, operating hours, diagnostic facilities, and additional facilities—providing empirical evidence for service providers to prioritize service improvements and marketing strategies. The findings contribute to both academic discussions on customer preference analysis in veterinary services and practical recommendations for animal healthcare providers in Surabaya.

Conjoint analysis was first introduced by Luce and Tukey (1964) and later applied to marketing research by Green and Rao (1971). Conjoint analysis is a multivariate analytical method used to understand how customers develop preferences for products or services based on their underlying attributes (Al-Omari et al., 2022). This method decomposes overall customer preferences for an alternative into part-worth utility values for each attribute, allowing researchers to identify the attributes that are most influential in the decision-making process (Rao, 2014). The basic formula of conjoint analysis is as follows:

$$U(X) = \Sigma j \, \Sigma m \, \beta jm \cdot xjm$$

where U(X) is the total utility value, βjm is the m-level partial utility value on the jth attribute, and xjm is the dummy variable. The *relative importance* value of each attribute is calculated using: $Ij = (\max(\beta j) - \min(\beta j)) / \Sigma(\max(\beta j) - \min(\beta j)) \times 100\%$.

Several previous studies have used conjoin analysis in various service contexts, as summarized in Table 1 below.

Table 1. Summary of Previous Research Studies

No.	Author (Year)	Research Focus	Key Findings
1	Bagaskara et al. (2025)	Selection of expedition services	The attributes of shipping type, promotion, responsiveness, and payment methods are most in demand by customers.
2	Lee et al. (2025)		Doctors prioritize diagnosis & data security; Patients prioritize convenience and access to medical information.
3	Koide et al. (2025)	Circular economy preferences	Price is the main determining factor. Circular business models are preferred over traditional products.
4	Hou et al. (2023)	Attributes of robo-advisor services	The attributes of promotion and investment education have a positive effect. Utilities differ depending on age and income.
5	Liu et al. (2024)	Osteoporosis treatment preferences	The effectiveness of drugs preventing hip fractures is the most influential attribute.
6	Zheng et al. (2023)	Hospital endoscopic maintenance	Response speed > quality of maintenance > price. Primary hospitals prioritize price; Tertiary hospitals prioritize quality.
7	Al-Omari et al. (2022)	Digital health app preferences	Priority: personal data security, medical support, and cost of use.
8	Muth et al. (2021)	Glaucoma screening preferences	Examination sensitivity is the most influential attribute, followed by cost and specificity.
9	Widodo & Antonio (2021)	Preference plaster sheets	The thickness of the product is the most important factor, followed by quality, method of purchase, and surface coating.
10	Bardhan et al. (2020)	Animal health services in India	The place of service and provision of drugs is an important factor. Distance is still the main obstacle.

Demographic factors provide an understanding of its influence on decision-making. Hou, et al. (2023) show that age and income affect customer sensitivity to price and service facilities. Gender, age, and income are personal factors that can influence customers' preferences and priorities in choosing a service (Kotler & Keller, 2025). Based on the literature review, the hypotheses formulated are: (H1) There is a difference in the level of customer preference in attributes that represent the Marketing Mix in influencing the preferences of animal health service unit selection; (H2) Demographic factors, gender, have a significant influence and relationship on decision-making; (H3) Demographic factors of age have a significant influence and relationship on decision-making; (H4) Demographic factors of monthly income have a significant influence and relationship on decision-making.

METHOD

The study employed a conjoint experimental design based on a full-profile procedure. A purposive sampling technique was applied with the following inclusion criteria: respondents

aged at least 18 years, pet owners, had visited a veterinarian, and had a monthly income. The sample size was determined using the Cochran formula with a 95% confidence level (Z = 1.96) and a 5% margin of error, resulting in a minimum requirement of 384 respondents. Data were collected from 392 respondents through two methods: conventional questionnaires distributed across 13 animal healthcare service units located in five areas of Surabaya City (332 respondents) and online questionnaires distributed through Google Forms (60 respondents).

The independent variables consisted of six service attributes representing the marketing mix elements: consultation and examination fees, service location, veterinarian experience, operating hours, diagnostic facilities, and additional facilities. The dependent variable was customer preference in selecting animal healthcare service units, measured using a 5-point Likert scale. Control variables included respondent demographic characteristics, namely gender, age, and monthly income. The combination of six attributes with their respective levels generated 216 possible stimulus profiles. Based on the orthogonal design, 10 representative stimuli were required as a minimum; however, this study used 15 stimulus combinations. The attributes and levels applied in the study are presented in Table 2.

Table 2. Attributes and Levels of Conjoined Analysis

No.	Attributes	Level
1	Consultation & check prices	IDR 50,000 – IDR 200,000
		IDR200,001 – IDR450,000
		> IDR450,000
2	Location	< 5 km from the house
		5–10 km from home
		> 10 km from the house
3	Doctor's experience	
		Experienced (> 3 years)
4	Hours of operation	Regular business hours (08:00–17:00)
		Long working hours (08.00–21.00)
		24 hours
5	Diagnostic facilities	Microscope only
		Complete (microscope, blood test, ultrasound, and X-ray)
6	Additional facilities	No additional facilities

Data analysis was carried out using the SPSS application which includes: (1) conjoined analysis to calculate *the value of part-worth utilities* and the *relative importance* value of each attribute; (2) the Spearman and Kendall Tau correlation test to measure the relationship between demographic factors (age and income) and customer preferences; and (3) ordinal logistic regression analysis to measure the influence of demographic factors (gender, age, and income) on customer preferences.

RESULTS AND DISCUSSION

Characteristics of Respondents

Based on the results of data collection, the number of respondents collected was 392 respondents. Based on the descriptive analysis, the distribution of respondents by gender, age, and monthly income is presented in Table 3, Table 4, and Table 5, respectively.

Table 3. Distribution of Respondents by Gender

Gender	Quantity (n)	Percentage (%)
Male	129	32,91
Women	263	67,09
Total	**392**	**100,00**

Table 4. Distribution of Respondents by Age

Age Group	Quantity (n)	Percentage (%)
18–25 years old	86	21,94
26–35 years old	106	27,04
> 36 years old	200	51,02
Total	**392**	**100,00**

Table 5. Distribution of Respondents Based on Monthly Income

Revenue Group	Quantity (n)	Percentage (%)
< IDR 5,000,000	89	22,70
IDR 5,000,000–IDR 8,000,000	154	39,29
IDR 8,000,000–IDR 12,000,000	130	33,16
> IDR 12,000,000	19	4,85
Total	**392**	**100,00**

Female respondents dominated with 67.09%, which is consistent with the findings of Mohan, et al. (2025) that women tend to be more active in seeking health services than men. The age group over 36 years is the largest group (51.02%), which is supported by Reniers, et al. (2022) that pet ownership plays an important role in the lives of older people. In terms of income, most respondents are in the group of IDR 5,000,000-IDR 8,000,000 (39.29%), equivalent to or above the 2026 Surabaya City Minimum Wage (UMK) of IDR 5,288,796 (East Java Provincial Government, 2025). These findings are in line with Wu, et al. (2024) that pet ownership tends to be more prevalent in groups with better socioeconomic status.

Combined Analysis

A conjoin analysis is performed to measure the utility level of each service attribute that represents the Marketing Mix element. The results of the conjoined analysis show good validity as presented in Table 6.

Table 6. Results of Validity of Conjoined Analysis

Validity	Coefficients	Sig.
Pearson's R	.990	.000
Kendall's Tau	.829	.000

The results of the validity test showed a p-value of < 0.05, which indicated that the conjoin analysis model used had good validity. The relative *importance value* of each attribute is presented in Table 7.

Table 7. Relative Importance Value Attribute

No.	Attributes	
1	Consultation & check prices	52,227
2	Location	15,511
3	Doctor's experience	4,577
4	Hours of operation	12,757
5	Diagnostic facilities	4,255
6	Additional facilities	10,672

The *part-worth utility* values of each attribute level are presented in Table 8.

Table 8. Part-Worth Utility

No.	Attributes	Level	
1	Consultation & check prices	IDR 50,000–IDR 200,000	.948
		IDR 200,001–IDR 450,000	.150
		> IDR450,000	-1,098
2	Location	< 5 km from the house	.263
		5–10 km from home	-.024
		> 10 km from the house	-.239
3	Doctor's experience		-.001
		Experienced (> 3 years)	.001
4	Hours of operation	Regular business hours (08:00–17:00)	.155
		Long working hours (08.00–21.00)	.086
		24 hours	-.241
5	Diagnostic facilities	Microscope only	.004
		Complete (microscope, blood, ultrasound, X-ray)	-.004
6	Additional facilities	No additional facilities	-.206
			.206

Based on the results of the combined analysis, the order of attributes that customers consider is: consultation & examination prices (52,227), location (15,511), operating hours (12,757), additional facilities (10,672), physician experience (4,577), and diagnostic facilities (4,255). The dominance of the consultation & check price attribute with *a relative importance* value of 52,227 is due to the fact that all service costs are borne directly by animal owners without an insurance system, in contrast to human health services (Hou, et al., 2023). The price level of IDR 50,000–IDR 200,000 has the highest utility value (0.948), while the price above IDR 450,000 has the largest negative utility value (-1,098). This shows that the higher the price of the service, the more customer preference decreases. This condition is in line with *the price-quality-value model* (Zeithaml, et al., 2018) and the concept *of budget constraint* in the customer economy (Monroe, 2003).

Location attributes ranked second with a distance level of less than 5 km having the highest utility value (0.263), while a distance of more than 10 km had a negative utility (-0.239). These results validate the concept *of distance decay* by Mseke, et al. (2024) and the findings of Bardhan, et al. (2020) regarding the importance of distance accessibility. The operating hours attribute ranks third, where regular business hours (08.00–17.00) have the highest utility value (0.155), while 24-hour service has negative utility (-0.241). These findings show that most respondents use services for routine needs, not emergencies.

Additional facilities ranked fourth (10,672), with a positive utility value (0.206) for services that provide *home visits, grooming*, or daycare. Physician experience and diagnostic facilities had the lowest *relative importance* values (4,577 and 4,255), with nearly identical utility values between the two levels of each attribute. This low value in diagnostic facilities can be explained through the theory of information asymmetry (Nunes & Manso, 2018), where customers have limitations to evaluate the needs of diagnostic facilities before services are received. Based on these results, there is enough evidence to reject H0.1 and accept H1.1, i.e. there is a difference in the level of customer preference in attributes that represent the Marketing Mix.

Spearman and Kendall Tau Correlation Test

The Spearman and Kendall Tau correlation test was used to measure the relationship between age and income demographic factors and customer preferences on each stimulus. Gender variables cannot be analyzed using this test because they include nominal data. The results of the correlation test are presented in Table 9.

Table 9. Spearman and Kendall Tau Correlation Test Results

Stimulus	Variable	Spearman (ρ)		Kendall Tau (τ)	
		Coefficients	Sig.	Coefficients	Sig.
1	Age	-0,009	0,858	-0,008	0,868
	Revenue	0,826	0,000	0,765	0,000
2	Age	0,013	0,797	0,012	0,799
	Revenue	-0,141	0,005	-0,130	0,005
3	Age	-0,009	0,863	-0,008	0,870
	Revenue	0,944	0,000	0,910	0,000
4	Age	-0,072	0,155	-0,068	0,153
	Revenue	-0,207	0,000	-0,192	0,000
5	Age	0,002	0,965	0,002	0,964
	Revenue	0,897	0,000	0,841	0,000
6	Age	-0,101	0,045	-0,093	0,043
	Revenue	0,428	0,000	0,388	0,000
7	Age	-0,090	0,076	-0,085	0,075
	Revenue	-0,032	0,533	-0,030	0,530
8	Age	0,047	0,351	0,045	0,350
	Revenue	-0,038	0,459	-0,035	0,458
9	Age	-0,070	0,166	-0,067	0,165
	Revenue	0,364	0,000	0,339	0,000
10	Age	0,021	0,683	0,020	0,681
	Revenue	0,145	0,004	0,135	0,004
11	Age	0,050	0,320	0,048	0,316
	Revenue	0,147	0,004	0,136	0,004
12	Age	0,018	0,722	0,017	0,721
	Revenue	0,636	0,000	0,594	0,000
13	Age	0,051	0,312	0,048	0,310
	Revenue	-0,168	0,001	-0,154	0,001
14	Age	0,109	0,030	0,104	0,030
	Revenue	-0,347	0,000	-0,323	0,000
15	Age	-0,031	0,545	-0,029	0,543
	Revenue	0,510	0,000	0,474	0,000

Based on the results of the correlation test, the age factor in general did not show a significant association with respondents' preference for most stimuli, with the significance values of Spearman and Kendall Tau mostly above 0.05. Although there were two stimuli

(stimulus 6 and 14) that showed a significant relationship with the age variable, the correlation strength of both was very weak, so age could not be considered a factor that significantly influenced preference. This finding is supported by Khawaja, et al. (2024) who stated that age cannot be used as a single reference to assess customer preferences.

In contrast to age, the income factor showed a more significant and consistent relationship, most stimuli had a significant relationship with income, except for stimulus 7 and 8. Stimulus 1, 3, 5, and 12 showed a strong positive relationship, indicating that higher-income groups were more likely to choose services with experienced physicians, complete diagnostic facilities, and ancillary services. Methodologically, the consistency of income factors in the Spearman and Kendall Tau correlation tests provided strong validation. Based on these results, the study failed to reject H0.3 (insignificant age) and reject H0.4 (significant income).

Ordinal Logistic Regression Analysis

Ordinal logistic regression analysis was used to determine the influence of demographic factors on customer preferences, with dependent variables in the form of Likert scale scores of 1–5. Before interpretation, a *goodness-of-fit test was carried out*, the results of which are presented in Table 10.

Table 10. Model Goodness Test Results

	Chi-Square	df	Sig.
Pearson	207,220	82	0,000
Deviance	53,018	82	0,995

The significance value of the Deviance test of 0.995 > 0.05 indicates the model is worth using. A significant Pearson value (0.000) can occur due to the presence of cells with *zero frequencies* in the data, so Deviance is used as the main reference. The model *threshold* values are presented in Table 11.

Table 11. Threshold Value of Ordinal Logistic Regression Model

Threshold	Estimate	Sig.
Y = 1	-9,841	0,000
Y = 2	-7,478	0,000
Y = 3	-5,065	0,000
Y = 4	-1,792	0,000

All *threshold values* were statistically significant (p-value < 0.05), confirming that the ordinal structure of the dependent variable was feasible and consistent. The results of ordinal logistic regression analysis for each demographic factor are presented in Table 12.

Table 12. Results of Ordinal Logistic Regression Analysis

Demographic Factors	Categories	Estimate (β)	Sig.
Gender (X_1)	Male	0,264	0,289
	Women (references)	0a	—
Age (X_2)	18–25 years old	-0,051	0,877
	26–35 years old (reference)	0a	—
	> 36 years old	-0,060	0,825
Revenue (X_3)	< IDR 5 million	-9,211	0,000
	IDR 5–8 million	-6,058	0,000
	IDR 8–12 million (reference)	0a	—
	> IDR12 million	0,327	0,681

a Reference category

Demographic Factors of Gender

The results showed that men tended to have a higher preference score than women (β = 0.264), but the effect was not significant (p-value = 0.289 > 0.05). Thus, gender demographic factors do not have a significant influence on customer preferences in choosing animal health service units in the city of Surabaya. The results of this study are in line with Liu, et al. (2024) who found that most gender factors do not have a significant influence on patients' preferences in choosing medical therapies. Surriandari, et al. (2025) also mentioned that gender is an inconsistent factor in showing satisfaction with medical services. When economic attributes such as price dominate (52,227), demographic variables including gender lose their influence. Based on these results, the study failed to reject H0.2.

Age Demographic Factors

The > age group of 36 years (β = -0.060, p = 0.825) and the age group of 18–25 years (β = -0.051, p = 0.877) both showed no significant effect on preference compared to the reference group of 26–35 years. These results show that preferences for animal health services are relatively similar across different age groups. This finding is consistent with Khawaja, et al. (2024) who stated that age cannot be used as a single reference to assess customer preferences. In the digital age, animal owners of different age groups have equal access to animal health information through online media, so all age groups develop similar preference criteria (Ogundijo, et al., 2022). Based on these results, the study failed to reject H0.3.

Demographic Factors of Income

The income factor showed the most significant influence. The income groups of < IDR 5 million (β = -9.211, p < 0.05) and IDR 5–8 million (β = -6.058, p < 0.05) showed a much lower overall preference tendency compared to the reference group of IDR 8–12 million. The income group > IDR 12 million had a positive β (0.327) but not significant (p = 0.681). The income group < IDR 5 million has a very high price sensitivity, where the price is not just a preference but a real *budget constraint*. They even make an aggressive *trade-off* by accepting *fresh graduate* doctors as long as the cost remains low and the location is close. The income group > IDR 12 million did not differ significantly from the reference group, indicating that

these two high-income groups had relatively similar preference patterns. These findings are in line with Hou, et al. (2023) and Martins, et al. (2012) who stated that the higher the income, the more likely a person is to choose services with more complete quality and features. Based on these results, the study successfully rejected H0.4.

CONCLUSION

Based on the results of the conjoint analysis, ordinal logistic regression, and correlation tests, it can be concluded that differences existed in the level of customer preference among the attributes representing the Marketing Mix in influencing the selection of animal healthcare units in Surabaya City. The attributes were ranked according to their level of influence as follows: consultation and examination fees, location, operating hours, additional facilities, veterinarian experience, and diagnostic facilities. Demographic factors, including gender and age, did not demonstrate significant influences or relationships with customer decision-making, whereas income consistently showed a significant influence on customer preferences.

As recommendations, animal healthcare providers are advised to implement competitive and transparent pricing strategies, improve location accessibility by considering home-visit services for customers facing geographic barriers, and provide more flexible operating hours to accommodate customers with different schedules. Service segmentation strategies should be developed based on customers' economic capabilities. The lower-income segment may be approached through a value-for-money strategy emphasizing price transparency and service quality assurance, whereas middle- and upper-income segments may be better served through premium service differentiation that highlights comprehensive diagnostic facilities and additional services. Policymakers may use these findings as a reference for developing minimum service standards for animal healthcare facilities to promote consistency in service quality received by the community in Surabaya City.

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