

# Relationship between customer satisfaction and customer loyalty in the clinical laboratory of the University Hospital of Kinshasa, Democratic Republic of the Congo

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**Abstract.** The customer satisfaction-customer loyalty association is one of the most vital relationships for marketing theory and practice. However, there is a lack of consensus in the literature and among researchers about the causal link between the two concepts. The purpose of this research is to determine the strength and direction of the relationship between customer satisfaction and customer loyalty in a clinical laboratory. This study proposes a mathematical model examining the relationship among two variables: customer satisfaction and customer loyalty. It is based on the survey data collected from 330 attending physicians in the University Hospital of Kinshasa. The chi-square test of independence and linear regression analysis techniques are used to investigate the relationship between the two variables. The key findings of the study indicate that customer satisfaction and customer loyalty are related ( $\chi^2 = 226.978$ ,  $df = 1$ ,  $p < 0.001$ ). There is a strong positive significant linear relationship between the two variables ( $r = 0.892$ ,  $N = 330$ ,  $p < 0.001$ ). The  $R^2$  value of 0.795 reveals that customer satisfaction accounts for 79.5% of the variation in customer loyalty. The mean customer loyalty value increases by 0.945 for every one unit change in customer satisfaction ( $loyalty = 0.945 \text{ satisfaction} + 0.347$ ). Customer loyalty is a function of customer satisfaction. Laboratory management should concentrate on customer satisfaction to improve customer loyalty and, thus, assure laboratory survival in the current competitive environment.

**Keywords:** Customers' satisfaction, clinical laboratory, Democratic Republic of the Congo, Customers' loyalty.

## INTRODUCTION

The starting point and the ending point of any business are the customers. Businesses identify the needs of

customers (consumers) through the use of market research methods. Once the needs of consumers have

been identified, a business must then decide if it can satisfy those needs by producing goods or services which they can sell to the consumer at a profit. This is the main purpose of business activity i.e. without customers, there is no business. Ultimately, customers hold all the power in the business world – as Sam Walton, the charismatic founder of Wal-Mart (the world's biggest retailer), famously said: "There is only one boss – the customer. And he can fire everyone in the company, from the chairman on down, simply by spending his money somewhere else" (Sethna and Blythe, 2016).

The fundamental basis for marketing thinking is that the customer should be at the centre of everything the firm does. This is known as a customer base. The business must then build customer relationships to maintain the loyalty of its customers to the business and its products or services. Customer loyalty should be the business's top priority because, without loyal customers that continue to buy products from a company or consume the company's services, the business would not survive (Rai and Srivastav, 2014). One of the best ways to build customer loyalty is to improve customer satisfaction. Faris *et al.* (2010) wrote that "customer satisfaction provides a leading indicator of consumer purchase intentions and loyalty."

The customer satisfaction-customer loyalty association is one of the most vital relationships for marketing theory and practice, due to the marketing effectiveness that these metrics summarize and their implications for firms' current and future product-marketplace and financial performance (Bae, 2012).

## LITERATURE REVIEW

### Customer satisfaction

The most straightforward definition of customer satisfaction was provided by American marketing guru Philip Kotler. "If the product matches expectations, the consumer is satisfied; if it exceeds them, the consumer is highly satisfied; if it falls short, the consumer is dissatisfied". Based on this definition, satisfaction is a relative concept encompassing the customer's expectations as well as the performance of the product. Whilst this definition was product-focused, it has since been recognized that customer satisfaction applies equally to services as well as to any individual element of a customer's product or service experience (Nigel *et al.*, 2007). Hence, customer satisfaction is a measure of how products and services supplied by a company meet or surpass customer expectations. In this case, customer satisfaction is defined as "the number of customers, or percentage of total customers, whose reported experience with a firm, its products, or its services (ratings) exceeds specified satisfaction goal (Farris *et al.*, 2010). A nice, easy-to-remember customer satisfaction

definition is: « Customer satisfaction is a consumer's perception of how well an organization has delivered on their communicated value proposition ».

The key points to note about this definition are:

- Customer satisfaction is the perception of a consumer,
- It is primarily based on two top-level factors, namely expected value versus delivered value,
- The organization contributes to the consumer's level of expectation through their communicated value proposition (that is, product quality, price, benefits, status, service, and so on).

A more academic definition is Oliver's definition:

"Satisfaction is the consumer's fulfillment response. It is a judgment that a product or service feature, or the product or service itself, provided (or is providing) a pleasurable level of consumption-related fulfillment, including levels of under-or over-fulfillment" (Oliver, 1997). In this definition, the keywords to focus upon are "judgment" and "fulfillment" – that is, the consumer judges how well the product or service fulfilled their needs. Based on the above definitions, customer satisfaction, or dissatisfaction, is the feeling a customer has about the extent to which their experiences with an organization have met their needs. So customer satisfaction is a relative concept. It's the customer's subjective judgement or feeling, the attitudes they hold, about the extent to which their requirements have been met by a supplier.

A study on customer satisfaction with laboratory services at the University Hospital of Kinshasa revealed that customer satisfaction is a three-dimensional variable made up of reliability of tests' results, responsiveness of services and laboratory personnel's willingness to help (Chabo Byaene *et al.*, 2021).

The reason why the measurement of customer satisfaction is so important is that attitudes drive behaviours, so customer satisfaction is a key lead indicator of future customer behaviours and, therefore, future company performance (Nigel *et al.*, 2007).

### Customer loyalty

There are two authors, Dick and Basu, which dealt with the interplay of attitudinal and behavioural loyalty and presented a sophisticated model in 1994. Dick and Basu (1994) define loyalty as "the relationship between the relative attitudes toward an entity (brand/service/store/vendor) and patronage behavior" (Dick and Basu, 1994). Oliver (1999) however defines loyalty as a deeply held commitment to rebuy or repatronize a preferred product or service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts that have the potential to cause switching behavior. He introduces a four-stage loyalty

model, implying that different aspects of loyalty do not emerge simultaneously, but rather consecutively over time. More than a clarification, this model extends the loyalty sequence “cognitive-affective-conative” by including an observable behavior, for example, actual purchase behavior (Oliver, 1999). Customer loyalty is defined by Uncles *et al.* (2003) as the extent to which the customer desires to maintain a continuing relationship with the firm or brand; in other words, customer commitment. A cross-sectional study design was conducted at the clinical laboratory of the University Hospital of Kinshasa from April 2019 to March 2020. This research demonstrated that clinical laboratory customer loyalty has a three-dimensional structure consisting of normative commitment, affective commitment and continuance commitment (Chabo Byaene *et al.*, 2021).

### **Customer satisfaction – customer loyalty relationship**

The direction of causality between customer satisfaction and customer loyalty is an important unresolved issue. There is a lack of consensus in the literature and among researchers about the causal link between the two concepts. Studies have been conducted in a variety of sectors, including banking, supermarkets, hotel services and telephony. Two main views emerged from the literature review of the satisfaction-loyalty relationship.

The first view concluded that there is a positive and linear relationship between customer satisfaction and customer loyalty. Rust and Zahorik (1993) stated that greater customer satisfaction leads to greater intent to repurchase. Bowen and Chen (2001) found that customer satisfaction positively and significantly affects the customer's loyalty. Singh (2006) stated that satisfaction positively correlates with the willingness to make a repeat order, and possibly recommends our product or service, loyalty and profitability. Bontis *et al.*, (2007) examined the causal construct between customer satisfaction and customer loyalty in the North American banking industry and found that there is a positive association between customer satisfaction and customer loyalty. Heitmann *et al.* (2007) stated that satisfaction positively affects loyalty, willingness to recommend, and word-of-mouth. Further, satisfaction affects future consumer choices, which in turn leads to improved consumer retention. Customers stay loyal because they are satisfied, and want to continue their relationship.

Although many research results pointed out that there was a positive and linear relationship between customer satisfaction and loyalty, a number of contributions to the services marketing literature over the past decade have called this into question and empirical studies have begun to demonstrate service contexts in which customer satisfaction and loyalty do not always correlate positively (Silvestro and Cross, 2000; Kamakura *et al.*, 2002; Pritchard and Silvestro, 2005). Carpenter and Fairhurst

(2005) suggest that satisfaction influences relative attitude, repurchase, and recommendation but has no direct effect on loyalty (Carpenter and Fairhurst, 2005). Hau and Thuy (2011) found that service value and satisfaction are proved as two mediating constructs in the impact of service personal values on customer loyalty (Hau and Thuy, 2011).

There are also many types of relationships between customer satisfaction and customer loyalty suggested by researchers. Tuu and Olsen's (2010) study discusses and tests the nonlinear nature of the satisfaction–loyalty relationship under different conceptual relationships and suggests that competitive models should be used to detect the true specification of the satisfaction–loyalty relationship. Marketers and managers should be aware of possible nonlinearities when predicting loyalty based on satisfaction because the prediction of loyalty based on a traditional linear model could generate biases. Lee *et al.*, (2016) confirmed a nonlinear relationship between customer satisfaction and brand loyalty. Castañeda (2011) proposed a four-way classification of the perspectives that tend to be taken by researchers on the relationship between satisfaction and loyalty and found that the satisfaction–loyalty relationship is moderated by involvement and mediated by trust. Among the four approximations, the one that best explains this relationship is the one called ‘moderating and mediating variables.’

With all this confusing and contradictory evidence, additional research is needed to further the understanding of these constructs and their relationships (Leingpibul *et al.*, 2009).

In the process of collecting studies for the literature review, we have identified the fact that there is no published empirical work on the satisfaction-loyalty relationship in clinical laboratories. Additional research is needed to further the understanding of these constructs and their relationships in the case of medical laboratories. The main focus of this research will be concentrated on finding an answer to the following question: What is the nature of the relationship between customer satisfaction and customer loyalty?

Mohsan *et al.* (2011) opined that customer satisfaction has a positive relationship with customer loyalty. They also concluded that it is impossible to have loyalty without satisfaction. Based on Mohsan's conclusion, we make the following hypothesis: there is a strong positive significant linear relationship between clinical laboratory customers' satisfaction and loyalty. Using exploratory and confirmatory factor analyses, previous studies have shown the dimensionality of customer satisfaction (Chabo Byaene *et al.*, 2021) and customer loyalty in the clinical laboratory of the university hospital of Kinshasa (Chabo Byaene *et al.*, 2021). Now, the purpose of this study is to determine the strength, magnitude, and direction of the hypothesized satisfaction-loyalty relationship in a tertiary clinical laboratory. This will be a major contribution to the

area of service quality in clinical laboratories.

## MATERIAL AND METHODS

### Setting and study design

A cross-sectional study design was conducted at the University Hospital of Kinshasa. It is a survey study conducted from January to March 2020.

### Study population

Medical laboratories have a range of customers including physicians, patients, public health agencies and the community. A central figure in the client list is the physician or health care provider. The initial service request originates with this person, and the laboratory staff generally identifies the ordering physician as the primary client (WHO, 2000). We surveyed attending physicians because they are directly involved in the process of ordering laboratory tests and reviewing subsequent results in the physician home setting. Thus, they are the first and the most important category of clinical laboratory customers.

### Sampling method and sample size

Our sampling was exhaustive. The total number of subjects included was 330 doctors. The formal survey involved all available physicians (All Heads of concerned departments, senior residents, postgraduates and junior residents):

1. Who have worked at the medical institution for more than half a year,
2. Who were regularly requiring laboratory investigations to be performed,
3. Who were on duty during the study period, and agreed to participate in the study.

### Data collection

To collect data and test the hypothesis of the study, a reliable and valid questionnaire was distributed to customers during the period of January-March 2020. In this study, customer satisfaction is defined as the result of the subjective comparison of the expectations of the attending physician to the perceived performance of the clinical laboratory, while customer loyalty is the attending physician's willingness to recommend the clinical laboratory's services to his patients.

In the questionnaire completed by the customers, there were 14 measurement items related to satisfaction

(Chabo Byaene *et al.*, 2021) and 14 other items related to the loyalty constructs of customers stemming from previous researches (Chabo Byaene A *et al.*, 2021). The scale was developed to measure the impact of customer satisfaction on customer loyalty using a seven-point Likert scale with responses ranging from 1 to 7, where 1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = Indifferent, 5 = slightly agree, 6 = agree and 7 = strongly agree. Strongly disagree, disagree, and slightly disagree responses were considered as dissatisfied or disloyal, whereas slightly agree, agree, and strongly agree responses were considered as satisfied or loyal.

A demographics section was also included in the questionnaire containing questions regarding gender, age, qualification and department of the respondents. Trained and qualified investigators conducted the survey, distributed unified questionnaires to 330 physicians and then collected the following day. The customers responded to the questionnaire by writing directly on the paper.

### Data analysis

The collected data were then analyzed using Microsoft Excel and SPSS 21.0 (SPSS Inc., Chicago, IL, USA). The study explored and established the existence of a relationship/interdependence between customer satisfaction and customer loyalty. The theoretical framework of the study along with the hypothesis is as follows:

H1: Customer satisfaction is significantly and positively associated with customer loyalty.

The research design is based on quantitative research. Using a 7-point Likert scale, the results were rated as follows: 0, strongly disagree; 16.6, disagree; 33.3, slightly disagree; 50, indifferent; 66.6, slightly agree; 83.3, agree; and 100, strongly agree.

We will then analyze the data and we will first carry out a demographic analysis, the dependence between the variables of the study and then the regression analysis carried out to study the influence of independent variables on dependent variables. Based on the linear regression model, the equation is explained as:  $CL = \beta_1 CS + E$

Where CL= Customer Loyalty;  $\beta_1$ = regression coefficient (slope); CS = Customer Satisfaction; E = constant. (Figure 1)

### Ethics approval and consent to participate

Before implementing the study, ethical clearance was obtained from the ethical review committee of the Public Health School, University of Kinshasa. The respondents

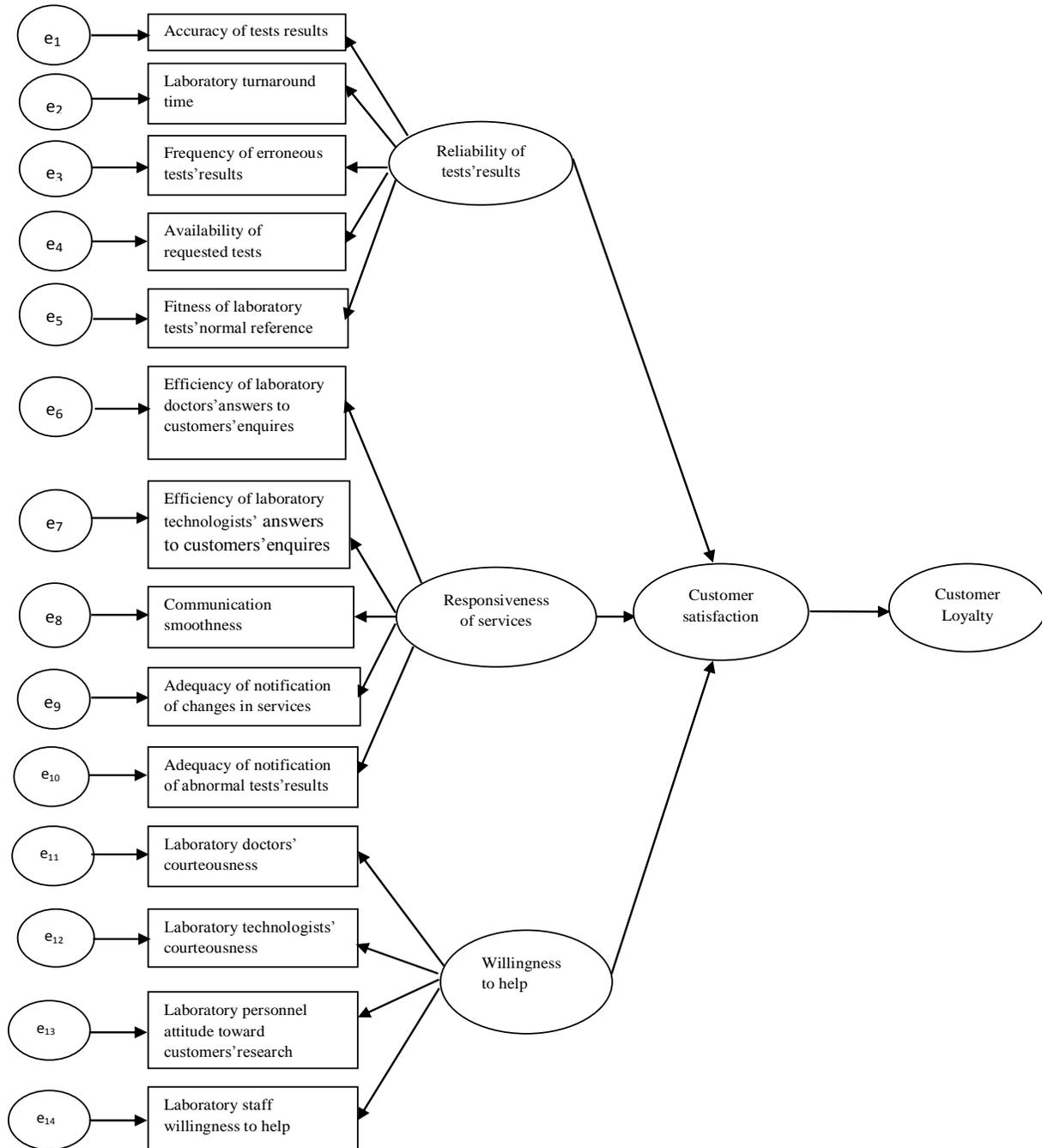


Figure 1. Conceptual framework.

were informed of the purpose of the study and assured of confidentiality and their right to withdraw from the study. Verbal and informed consent was obtained after the study objectives were explained to each participant and confidentiality was maintained throughout the study.

**RESULTS**

The demographic statistics for respondent profiles

showed that 59.7% of respondents were male and 40.3% of respondents were female (Table 1). Furthermore, the age distribution explored that the age group ranging from 38 to 47 has the highest response rate of 30.9%. Regarding the department, 19.4% of the respondents were from Internal Medicine, 18.2% from Pediatrics, 15.2% from Surgery, 13.9% from Gynecology, while the remaining 33.3% were from specialties (i.e. ophthalmology, dermatology, stomatology and oto-rhinolaryngology). Concerning the Academic title, 30.6% of

**Table 1.** Sociodemographic characteristics of customers.

		<b>N</b>	<b>%</b>	<b>Cumulative %</b>
Gender	Male	197	59.7	59.7
	Female	133	40.3	100
	Total	330	100	
Age (years)	18 – 27	26	7.9	7.9
	28 – 37	76	23.0	30.9
	38 – 47	102	30.9	61.8
	48 – 57	72	21.8	83.6
	≥ 58	54	16.4	100
	Total	330	100	
Department	Internal Medicine	64	19.4	19.4
	Pediatrics	60	18.2	37.6
	Surgery	50	15.2	52.8
	Gynecology	46	13.9	66.7
	Specialties	110	33.3	100
	Total	330	100	
Academic Title	Junior Doctor	101	30.6	30.6
	Senior Doctor	87	26.4	57.0
	Specialist	66	20.0	77.0
	Senior Lecturer	41	12.4	89.4
	Professor	35	10.6	100
	Total	330	100	

**Table 2.** Contingency table.

	<b>Loyal</b>	<b>Disloyal</b>	<b>Total</b>
Satisfied	137	12	149
Dissatisfied	16	165	181
Total	153	177	330

respondents were junior doctors, 26.4% were senior doctors, 20.0% were specialists, 12.4% were senior lecturers and 10.6% were professors.

Table 2 shows the observed frequency of the two binary categorical variables. Customers were divided into four categories according to their level of satisfaction and loyalty: satisfied and loyal customers (137), satisfied but disloyal customers (12), dissatisfied but loyal customers (16), dissatisfied and disloyal customers (165).

Chi-square = 226.978, df = 1,  $p < 0.001$

The Chi-square test of independence shows that customer satisfaction and customer loyalty are related (Figure 2).

$$Y = 0.945X + 0.347$$

Y = Loyalty; X = satisfaction

The Bravais-Pearson correlation coefficient shows a strong positive significant linear relationship between the

two variables ( $r = 0.892$ ,  $N = 330$ ,  $p < 0.001$ ). Customer satisfaction is strongly correlated with customer loyalty in the Clinical laboratory. Customer satisfaction accounts for 79.5% of the variation in customer loyalty ( $R^2 = 0.795$ ). The mean customer loyalty value increases by 0.945 for every one unit change in customer satisfaction.

## DISCUSSION

Currently, to the best of our knowledge, no research exists on the relationship between customer satisfaction and customer loyalty in the clinical laboratory sector, particularly in the Democratic Republic of the Congo. The focus of this research is to determine the strength and direction of the relationship between customer satisfaction and customer loyalty in a clinical laboratory. The hypothesis of our research has been tested by correlation analysis and linear regression. Some

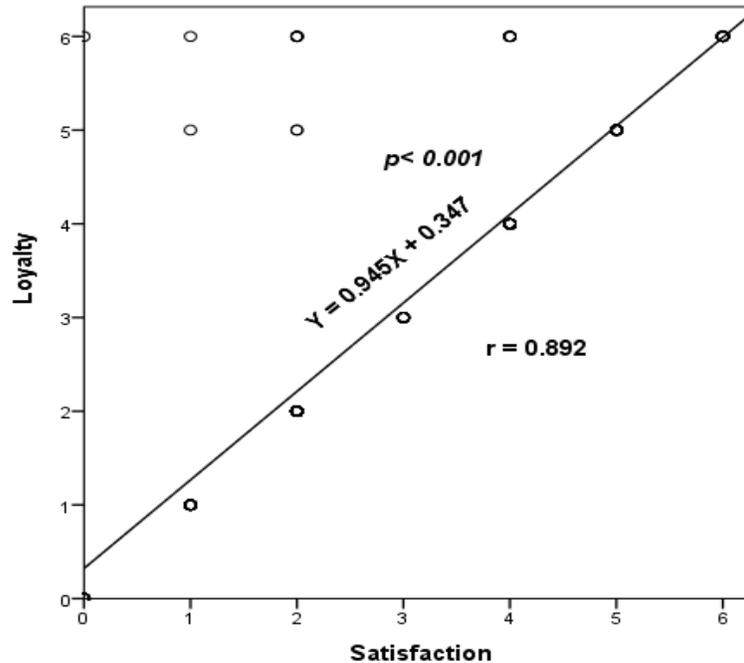


Figure 2. Correlation between customer satisfaction and customer loyalty.

significant results were found from this research.

Firstly, the customer-centric applications of the companies are based on the general opinion which assumes that customers, who are satisfied by a company's products or services, are expected to be loyal to the mentioned company (Silvestro and Cross, 2000). According to our findings, this opinion has not 100% guaranteed proof. Table 2 shows that 3.6% of customers were satisfied but disloyal and 4.8% of customers were dissatisfied but loyal. Therefore customer satisfaction does not always assure customer loyalty. The results of this study were consistent with Reichheld and Tam's studies. Reichheld concluded that customers who are satisfied with the service will also switch companies if they see that there is a better alternative elsewhere (Reichheld, 1993). On the other hand, Tam realized that, where there is no other choice, customers will continue purchasing from the same company even though they are dissatisfied with the service (Wicker and Browning, 2020).

Secondly, and according to our hypothesis, we examined the association between customer satisfaction and customer loyalty using the chi-square test of independence, also known as the Pearson Chi-square test or the chi-square test of association. The Chi-Square Test of Independence is a nonparametric test that determines whether there is an association between categorical variables i.e., whether the variables are independent or related. In other words, this test is used to determine whether the values of one of the 2 qualitative variables depend on the values of the other qualitative variable. This test utilizes a contingency table to analyze

the data. A contingency table (also known as a *cross-tabulation*, *crossstab*, or *two-way table*) is an arrangement in which data is classified according to two categorical variables. Like any statistical hypothesis test, the Chi-square test has both a null hypothesis and an alternative hypothesis. The null hypothesis of the Chi-Square test is that no relationship exists on the categorical variables in the population; they are independent (Abu-bader, 2021).

In this study, the chi-square test' result revealed that there is an association between the two variables (Table 2). The p-value  $< 0.001$  indicates that the association is statistically significant at the level of significance of 0.001. It means that knowing the value of customer satisfaction provides information about the value of customer loyalty.

Thirdly, the Correlation Analysis was applied to support the hypothesis that showed the positive influence of the independent variable (i.e. customer satisfaction) on the dependent variable (i.e. customer loyalty). Correlation analysis is a statistical method used to evaluate the strength of the relationship between two variables. A high correlation means that two or more variables have a strong relationship with each other, while a weak correlation means that the variables are hardly related. In other words, it is the process of studying the strength of that relationship with available statistical data. This technique is strictly connected to the linear regression analysis that is a statistical approach for modeling the association between a dependent variable, called response, and one or more explanatory or independent variables. The Pearson correlation coefficient,  $r$ , can take on values between -1 and 1. The further away  $r$  is from zero, the stronger the linear relationship between the two

variables. The sign of  $r$  corresponds to the direction of the relationship. If  $r$  is positive, then as one variable increases, the other tends to increase. If  $r$  is negative, then as one variable increases, the other tends to decrease. A perfect linear relationship ( $r=-1$  or  $r=1$ ) means that one of the variables can be perfectly explained by a linear function of the other. Linear regression analysis produces estimates for the slope and intercept of the linear equation predicting an outcome variable,  $Y$ , based on values of a predictor variable,  $X$  (Yen and Gwinner, 2003).

In the present study, the linear regression model shows that there is a strong positive significant linear relationship between the two variables ( $r = 0.892$ ,  $N=330$ ,  $p < 0.001$ ). Thus, as the level of customer satisfaction increases, the level of customer loyalty increases ( $\text{loyalty} = 0.945\text{satisfaction} + 0.347$ ). Customer loyalty is strongly influenced by customer satisfaction. This is further testified by the  $r^2 = 0.795$  (Figure 2). Therefore, our hypothesis is confirmed.

The findings of this study support some findings from previous research in the relationship marketing field postulating that customer satisfaction can activate customer loyalty. Johnson *et al.* (2001) highlighted the existence of a positive and significant direct effect of satisfaction on loyalty. Yen and Gwinner (2003) find that satisfaction has a positive and significant effect on customer loyalty. Khan (2012) in his research work concluded that customer satisfaction has a significant impact on customer loyalty (Khan, 2012). Awara and Anyadighibe (2014) suggested that customer satisfaction is a positive step towards customer loyalty which leads to gaining more profits by the firms (Awara and Anyadighibe, 2014). Minta's study (2018) concluded that Satisfaction has a strong correlation and significant, moreover positively affects customers loyalty (Minta, 2018).

From Figure 2, the coefficient of determination of 0.795 shows that only 79.5% of the variance in customer loyalty is predictable from customer satisfaction. The complementary part of the total variation, also called residual variation, is not explained by the proposed model. Satisfaction is unrelated to completely predict customer loyalty. Therefore, more research is required to predict the variables that play precursor to improve customer loyalty.

## CONCLUSIONS

On the basis of this study's results, it has been clarified that customer satisfaction is the powerful drive of customer loyalty. Although customer satisfaction is not the exclusive antecedent for customer loyalty, there is a strong positive significant linear relationship between the two variables. Therefore, to survive or even thrive in the current competitive environment, clinical laboratories need to focus their customer retention strategies on

customer satisfaction.

## Limitations of the study and suggestions for future

This study was limited to only the University Hospital of Kinshasa and not the entire hospital market in Kinshasa. Future research should, therefore, reproduce the study in other hospitals in order to confirm the results of our findings across the health system. Another limitation of this study is the generalization of its outcome. Medical laboratories have a range of customers including patients, physicians, public health agencies and the community. Because we surveyed ordering physicians only, we can't confirm that the correlation found is reliable or valid for other types of customers. Additional research could determine the relationship between customer satisfaction and customer loyalty among patients and other customers who attain the clinical laboratory.

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## Conflict of interest

The authors declare that they have no conflict of interest.

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