

Quality of home public service in a drinking water, cleaning and sewage company in the south Colombian region*

Calidad del servicio público domiciliario en una empresa de agua potable, saneamiento y alcantarillado de la región Surcolombiana

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Abstract

This research evaluates the quality of service (QS) of drinking water, sanitation and sewage services provided by a public service company in a peripheral region of Colombia. The study is quantitative and is carried out under the deductive and descriptive method. During the investigation, the SERVPERF scale proposed by Cronin and Taylor (1994) was adapted for the construction of the instrument. 702 surveys were carried out and processed according to the socioeconomic strata of the dwellings in the city. The results indicate that the scale obtained is a reliable and valid instrument to measure perceived quality (Cronbach's Alpha of 0.89); and that the survey is valid in terms of content, pragmatics and concept, which explains 51.60% of the variance through six factors, namely: Reliability (30.50%), Empathy (7.50%), Facilities (4.10%), Facilities I (4.00%), Response Capacity (2.80%), and Facilities II (2.70%).

Key words: Service Quality, Perceived Quality, Home Public Services, Drinking Water

* Artículo inédito. Artículo de investigación e innovación. Proyecto de investigación vinculado al Grupo de Investigación Pymes de la Facultad de Economía y Administración de la Universidad Surcolombiana.

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Resumen

La presente investigación evalúa la calidad de servicio (CS) de los servicios de agua potable, aseo y alcantarillado que presta una empresa de servicios públicos en una región periférica de Colombia. El estudio es cuantitativo, y se realiza bajo el método deductivo y de tipo descriptivo. Durante la investigación se adapta la escala SERVPERF propuesta por Cronin y Taylor (1994) para la construcción del instrumento. En total, se realizaron y procesaron 702 encuestas según los estratos socioeconómicos de las viviendas en la ciudad. Los resultados indican que la escala obtenida es un instrumento fiable y válido para medir la calidad percibida (Alfa de Cronbach de 0,89); y que la encuesta es válida en cuanto a contenido, pragmática y concepto, lo que explica el 51,60% de la varianza a través de seis factores, a saber: Confiabilidad (30,50%), Empatía (7,50%), Facilidades (4,10%), Instalaciones I (4,00%), Capacidad de Respuesta (2,80%), e Instalaciones II (2,70%).

Palabras Clave: Calidad del Servicio, Calidad Percibida, Servicios Públicos Domiciliarios, Agua Potable

SUMMARY

INTRODUCTION. - RESOLUTION SCHEME. - I. Research problem. - II. Methodology. - III. Drafting plan. - 1. Quality of service. - 2. Background. IV. 4. Research results. - 1. Socioeconomic characteristics - 2. Analysis by dimension - 3. Principal Component Analysis - CONCLUSIONS. - REFERENCES.

Introduction

This research on the Quality Service (QS) of Homestead Public Services (HPS) is part of the lines of study of the Faculty of Economics and Administration of the South Colombian University, which is why part of the introduction and the theoretical framework is similar to the study on Evaluation of the Quality of Homestead Public Services conducted by Montaña, Ramírez & Ramírez (2002). The HPSs for drinking water, electricity-wind, fixed-mobile telephone services and gas are essential for the social, economic and environmental well-being of communities and individuals around the world. Thus, every consumer has the right to access good quality services. In Colombia until 1994, the State had the exclusivity to supply them, since it was considered that the private sector did not have the resources and incentives to offer them (Ochoa, Valencia and Ayala, 1990). However, this situation changed in 1990 when the Government allowed the private sector to participate in providing such services. With the laws 142-143 of 1994, and the rulings of the Constitutional Court T-22 and T-187 of 1995, T-368 of 1997 and T-021 of 1998, the State established the incentives for this sector to operate like any other sector of the economy, to make investments and recover them. In addition, the rates were adjusted to the real costs of the service and the State took on the regulator role (Buitrago and Valencia, 2007).

To evaluate the QS in the services provided by a drinking water, sanitation and sewerage utility company, a variant of the SERVQUAL scale (Parasuramant, Zeithaml and Berry, 1988) was used, called SERVPERF and proposed by Cronin and Taylor (1994). It is a reliable and valid instrument

to measure QS from the customer's perspective. Using the SERVPERF scale will make it possible to reach reliable measurements that can serve as a basis for action, monitoring, and supervision of the progress of the SQ within the framework of the quality assurance programs that HPS companies must implement in Colombia. Managers will be able to use the results to identify, measure, and understand customer perceptions and ensure whether or not these assessments are being met, analyze the best performing sections, areas, divisions or branches, to compare their own performance with that of competitors and to anticipate the needs of consumers. It is expected that this research project will be the basis for the directors of the HPS companies of aqueducts, drinking, cleaning and sewage waters, to structure programs to improve the quality of the services they provide, as a result of business policies.

Resolution scheme

1. Research problem

What is the level of Quality of Service (CS) of drinking water, sanitation and sewage services provided by a public utility company in a peripheral region of Colombia?

2. Methodology

The general objective of the present research is to evaluate the QS provided by the companies, using the SERVPERF scale. This research was based on seven hundred twenty-six (726) structured surveys applied to users. Twenty-four (24) surveys were removed from the evaluation due to being poorly completed. To design the questionnaire, the following procedure was followed: 1. The perceptions of the SERVQUAL scale called SERVPERF were taken as a basis. 2. To contextualize the surveys, an exploratory study was conducted with twenty (20) users. 4. A draft of the instrument was then designed, which was tested on twenty (20) users. Subsequently, adjustments were made in the wording of the questionnaire, and they were applied to 726 users, according to the different socioeconomic strata. The results estimate a 95.00% confidence margin (5.00% level of error). The information collection was carried out in the city of southern Colombia, and took place between the months of January and April 2021. The data analysis was done by processing 702 surveys with the SPSS statistical package. With this package, reliability, validity, simple and cross processing, factor analysis, correlations, Cronbach's alpha and multiple regression analysis are obtained.

According to Grande & Abascal (2017), reliability means whenever the instrument is applied to the same person, it gives similar results, and it is reliable when its value is greater than 0.70. Hernández, Fernández & Baptista (2010: 302) state that alpha values greater than 0.50 correspond to an instrument with medium reliability, and those greater than 0.70 have good reliability. When calculating Cronbach's alpha with the 47 items of the applied instrument, a value of 0.89 was obtained, which means that the designed instrument is reliable and that the items collect valid information on the perception of the HPS. The results of Cronbach's alpha are similar to the study carried out in the same company by Montaña, Ramírez & Ramírez (2002) which resulted in 0.90. By dimensions, the reliability is as follows: Tangibility, 18 items, alpha of 0.94; empathy, 10 items, alpha of 0.86; response capacity, 8 items, alpha of 0.82; safety, 5 items, alpha of 0.78 and reliability, 6 items, alpha of 0.72. The results are consistent with what was proposed by Cortina

(1993), who maintains that the alpha decreases when the number of items involved in a dimension is lower.

According to Grande & Abascal (2017), validity means that the survey measures what it has to measure; and there are three types of validity: content, pragmatic, and concept. The content validity means that the items that make up the scale are adequate to make the measurements and it is achieved when a good review of the state of the art is made, nationally and internationally, and this was achieved because a specialized review was made on QS STUDIES written in the last thirty-five (35) years in the best American, European and Latin American journals. Pragmatic validity means that the scale serves to make current and future predictions and is classified as predictive and concurrent, and it is good when its value is greater than 0.50, or the relationship is significant (Grande and Abascal, 2017). To measure the predictive validity, a linear regression model was used where the dependent variable is current satisfaction and the independent variable is an artificial variable on "service quality", which is given by the average sum of the ratings given to all the variables evaluated (P1 to P47). $P48 = -1.07 + 1.026 (P1 \text{ to } P47)$. Significance: 0.00. The instrument has predictive validity because the level of significance is 0.000. To measure concurrent validity, a linear regression model was constructed where the dependent variable is current loyalty and the independent variable is an artificial variable "service quality". $P49 = 0.795 + 0.667 (P1 \text{ to } P47)$. The instrument has concurrent validity because the level of significance is 0.00.

The concept validity is divided into convergent and discriminant (Grande and Abascal, 2017). Convergent validity means that the same phenomenon measured in different ways gives rise to similar results. To evaluate it, a linear regression model was used where the dependent variable is the recommendation to third parties and the independent variable is an artificial variable on "service quality", which is given by the average sum of the scores given to all the variables evaluated. $P50 = 0.314 + 0.887 (P1 \text{ to } P47)$. The instrument has predictive validity because the level of significance is 0.000. To measure discriminant validity, correlations must be compared with scales that measure different concepts. If these are low, they indicate that there is discriminant validity. The scale used has discriminant validity because when evaluating the equation of recommendation to third parties with the variable: "the offices of the Companies are easy to find". It was found that it is not significant (0.015). $P48 = 3.128 + 0.107P1$; therefore, the survey has no discriminant validity.

3. Writing plan

3.1 Quality service

The concept of QS has been recently developed in Europe and the United States, starting in the 90s (Grönroos, 1994). The QS of HPS has been an aspect little investigated because it is a difficult dimension to quantify, to regulate and it is less tangible than price ranges. However, users do notice when it is missing (Palacios, 2000). The main contributions to SQ models are those made by Grönroos with his theoretical contribution to the definition and characteristics of the services, the SERVQUAL model by Parasuramant *et al.* (1985, 1988); and the SERVPERF Model by Croning & Taylor (1992), which are analyzed below.

The evolution of the SERVQUAL model began when Parasuraman *et al.* (1985) concluded that QS consists of 10 dimensions: 1. Reliability: which implies coherence in action. 2. Responsiveness: which refers to the will and skill of employees to provide good services. 3. Professionalism: which means having the skills and knowledge necessary to provide good services. 4. Accessibility: which regards how easily the client can approach and contact the company. 5. Courtesy: which includes the courtesy, respect, kindness and consideration of the service personnel with the clients. 6. Communication: which implies listening to customers and keeping them up to date. 7. Credibility: which means trust, honesty and keeping the customer's interest in mind. 8. Security: which refers to the client being free from dangers or doubts. 9. Understanding: which required adapting the service to the client's needs. 10. Tangible elements: which includes physical evidence of the service provided.

Moreover, Parasuraman *et al.* (1985) concluded that QS is meeting or exceeding customer expectations. QS is the difference between expectations and perceptions: expectations are promises that companies make to customers; perceptions are the ways that customers receive services through moments of truth. After conducting complementary studies and validating them with the multivariate analysis technique, Parasuraman *et al.* (1988) reduced the SERVQUAL scale to five factors: 1. Tangibility: Presentation of the physical facilities, equipment, personnel, and communication media. 2 Reliability: Ability to perform the promised service reliably. 3. Responsiveness: Willingness to help users and provide fast service. 4. Security: Knowledge and care shown by employees and their skills to inspire credibility and trust. 5. Empathy: Individualized attention that companies offer to their clients.

Considering these new approaches, Grönroos (1990) argues that the role of marketing in the service sector changed radically because it became a determining factor and of great significance. Thus, companies contacted experts to apply marketing concepts to services. The transposition of the concepts of quality and total quality from the industrial sector to the world of services emphasizes that quality must encompass products and services and that therefore it is vital to include the customer (Grönroos, 1990). This new vision of customer-centric quality implies that the concept of customer expectations and perceptions is of great importance, and that, to understand the term, desires, knowledge, experiences, prices, communication, distribution, etc., must be studied. In order to do so, one must put oneself in the customer's shoes and appreciate the service in all its manifestations and dimensions (Grönroos, 1990). The separation between the quality of the design (adaptation of the service to the customer's expectations) and the quality of implementation (adaptation of the activities to provide the service) allows to better analyze SQ (Grönroos, 1990). Grönroos (1994) states that QS is the result of integrating total quality in the dimensions of technical quality (what is given), functional quality (how it is given), and corporate image, which means that it relates quality to corporate image. The model proposed by Grönroos (1988) indicates that the total perceived quality occurs when the experienced quality satisfies the expected quality.

The SERVQUAL model has not been exempt from criticism. One of the main ones is related to the role of expectations and their inclusion in the measurement instrument because it is considered not valid since it is based on a system of divergences (expectations-perceptions) and not attitudes (Cronin and Taylor, 1992). Thus, Cronin & Taylor (1992) propose an alternative model called

SERPERF that is made up of the 22 items of the SERVQUAL scale but using only the perceptions of the service. The new model is recommended because there is evidence that clients value the perceived quality of a service in terms of the differences between expectations-perceptions as the statistics indicate that there is a generalized tendency to value expectations highly and that perceptions are what contributes more to the measurement of QS (Teas, 1993). Likewise, the structure of the questionnaire is criticized, because it implies asking a posteriori the expectations prior to the use of the service (Koelemeijer, 1992), and that the scale focuses on the process of distribution of the service and not on the moments of truth (Cronin and Taylor, 1992). Gómez, Méndez & Pérez (1994) maintain that the SERVQUAL model consists of three sections: the first, a list of 22 items (scale from 1 to 7) where the degree of expectation is marked; the second, another list of 22 items (scale from 1 to 7) where the degree of perceptions is marked; and the third, where the evaluation of the clients regarding the relative importance of the five dimensions is quantified, which allows to measure the scores obtained.

According to Horovistz (1990), QS is based on the following principles: the customer is the only judge of quality; the customer is the one who determines the level of excellence of the service; the company must make promises that allow it to achieve its objectives, earn money and differentiate itself from its competitors; the company must take into account the expectations of its customers because it allows reducing the differences between expectations and the provision of the service; the promises of the organization must be transformed into quality standards, and employees must be trained to reduce errors. According to Andrews (1980), the new business concept is corporate strategy, which indicates the duty of the company to set projects and goals based on competitive advantage, strategic planning and corporate objectives. This new managerial conception implies

1. Knowing the external environment. It involves knowing the structure of the company, management styles, plans and policies of the organization to adapt to changes in the environment.
2. Satisfy customer needs and expectations. To achieve this, companies must have a service orientation and good technical quality.
3. Be competitive and proactive. It implies a deep knowledge of the sector, the company, the consumer and customer trends, working with cutting-edge technologies and economies of scale.
4. Quality of the human factor. It means that employees are the foundation of the company and therefore there must be a strong corporate culture that involves: teamwork, creativity, continuous improvement, autonomy to solve problems and training employees in new trends.

Schiffman & Kanuk (2010) state that people act and react based on perceptions of products and/or services and not on objective reality. The authors argue that such reality is based on people's needs, desires, values and experiences, and that users find it more difficult to evaluate QS than the quality of products. For example, when rating the services of a doctor, users observe the furniture, the presentation, attention and friendliness of the employees, the number and the origin of the degrees framed on the walls. Thus, the authors state that QS varies from one day to the next for each employee and each client, and, therefore, the standardization of services must be sought to offer consistent quality.

3.2 Background

When reviewing national and international studies between 1998 and 2020 on HPS, one hundred and two (102) articles were found, of which fifty (50) evaluate various aspects of energy, and nineteen (19) numerous aspects of HPS. Twenty-six (26) study drinking water services; six (6), mobile telephone services; and one (1), gas. From the analysis of the 26 studies on drinking water, only 6 studies on SQ apply the SERVQUAL or SERPERF model: SQ (SERVQUAL) and citizen satisfaction (Petracci, 1998) (Argentina: The SERVQUAL model proposes, but not applies); SQ of public companies in Neiva (Montaña *et al.*, 2002) (SERVPERF, Colombia: Alpha 0.90, through factor analysis they identify three factors that explain 46.80%); Satisfaction of the drinking water and sewerage service (Corrales, 2003) (Lima); Satisfaction of urban water and sanitation (Maldonado, 2014) (Peru); Satisfaction of urban water and sanitation (Pastor, 2014) (Peru); Satisfaction of drinking water (Angulo and Peralta, 2016) (Colombia); SQ (SERVQUAL) and customer satisfaction (Benítez, 2016 (Peru: perceptions range between 2.40 and 2.90); Rural water and sanitation in Colombia perception of the water service of the community aqueducts of the commune 13 of Ibagué, with the negative implications that it can have for people's health (Pinilla *et al.*, 2016); Participatory management and its relationship with SQ (Huertas and Silverio, 2017) (Peru: SC perceived by workers is 3.60/5.00); Social perception of the drinking water service (Marqués and Ortega, 2017) (Mexico: 50.00% perceive that drinking water is colorless, tasteless and odorless, and sometimes contains sandy residues); SQ drinking water and sewerage (SERVQUAL), (Gallegos, Robles and Ahumada, 2018) (Mexico: Cronbach's Alpha 0.73-0.86, and the scale explains 64.5%); Evaluation and improvement of the drinking water supply system (Mejía, 2019) (Mexico); Social perception of the quality and management of drinking water (Ortiz and Núñez, 2019) (Peru); Satisfaction of the drinking water service (Pantoja, 2019) (El Salvador: Good, 44.80% quantity of water is sufficient 72.40%, characteristics of the water 75.90%, price 72.40%, it was not notified in time when the service was cut 58.60%); SQ of drinking water (Pinedo, 2019) (Peru: Low 52.00%); Internal customer satisfaction-SERVQUAL (Tenesaca, 2019) (Ecuador: 28 employees surveyed and found dissatisfaction gaps in all dimensions (-1.52); SQ drinking water supply - biological and chemical analysis (Zúñiga and Mora, 2020) (Costa Rica); SQ (SERVQUAL) of water and customer service (Arroyo and Eufracia, 2019) (Peru: 183 interviewed and concluded that there is a positive relationship between SQ and customer service (Macías, Macías and Cevallos, 2020) (Ecuador: chemical properties); Financial management for the public drinking water company (Zela, 2020) (Ecuador); Rate update (Montesillo, 2020) (Mexico); Problems and tensions associated with water supply (Chaverra and Espinel, 2020) (Colombia); Characterization of local aqueducts (Figueredo, Rincón and Salazar, 2020) (Colombia); Resilient drinking water and sanitation (Paltán, Basani, Minaya and Rezzano, 2020) (Latin America and the Caribbean); Water care in urban settings during the Covid-19 pandemic (Zamora, 2020) (Mexico).

4. Research results

4.1 Socio-economic characteristics

The main socioeconomic characteristics of the surveyed population were the following: Age: 38.60% between 18 and 30 years, 47.60% between 31 and 50 years, and 13.70% over 50 years. Gender: 56.40% female and 43.60% male. Educational level: 2.10% none, 11.30% primary,

44.80% secondary; 41.80% university. Stratum: 10.90% one, 10.90% two, 27.00% three, and 2.57% four or more. Marital status: 30.30% single, 51.00% married or common-law union, 14.70% separated, and 4.00% widower. Number of children: 35.50% none, 47.70% between 1 and 2, 14.50% between 3 and 4; 2.30% 5 or more children. Home ownership: 35.30% owner, 44.70% leased, 18.10% family, and 1.90% other.

4.2 Analysis by dimension

To analyze the dimensions of SQ, the definitions and dimensions proposed by Parasuraman *et al.* (1988) were taken as a basis and the ratings by dimensions were the following: tangibility, 3.80/5.00; empathy, 3.70/5.00; security, 3.70/5.00; reliability, 3.60/5.00, and responsiveness, 3.50/5.00. The results for each dimension are explained below:

Tangibility: It relates to the presentation of physical facilities, equipment, personnel and communication materials (Parasuramant *et al.*, 1988). The level of satisfaction was 56.00% because it was rated 2.80/5.00. From the results, it can be inferred that the best-rated variables were the company's offices are easy to find (3.20); the office staff is well identified, the cleaning service people sweep the city streets well. (3.20), and the facilities are illuminated (3.00).

Reliability: It is the fulfillment of the promises offered by the company (Parasuramant *et al.*, 1988). The level of satisfaction was 72.00% because it was rated 3.60/5.00. From the results, it is inferred that the best-rated variables were: The company delivers the receipts of payment on time (3.90); the personnel doing the repairs is well identified (3.90), and the cleaning service collects the trash in a timely manner (3.70).

Empathy: It is the individualized attention that HPS companies offer to their clients (Parasuramant *et al.*, 1988). The level of satisfaction was 68.00% because it was rated 3.40/5.00. From the results, it can be inferred that the best-rated variables were Customer service at the payment sites is good (3.60); employees give individual attention to users (3.50); the service hours are long (3.50), and the schedule of the payment sites are comprehensive (3.50).

Security: It refers to the knowledge and skills of employees to inspire credibility and trust (Parasuramant *et al.*, 1988). The level of satisfaction was 74% because it was rated 3.70/5.00. From the results, it is inferred that the best-rated variables were Payment sites are safe (3.80); the people in the cleaning service use the protection elements (3.70), and I trust the jobs the company does.

Responsiveness It is the willingness to help users and provide fast services (Parasuramant *et al.*, 1988). The level of satisfaction was 64.00% because it was rated 3.20/5.00. From the results, it can be inferred that the best-rated variables were: The statements are easy to understand (3.50); the service in the paid sites is good (3.80); staff provides adequate information to users (3.40), and the staff makes good recommendations to customers (3.30).

4.3 Principal Component Analysis

It is used to establish a correspondence between the theoretical dimensions of the SQ with those perceived by the users of the Companies, which summarizes information from metric variables and explains them by means of related factors through three (3) criteria (quartimax, varimax and equimax). The quartimax identifies each variable with at least one of the factors; the varimax identifies a group of variables with a single factor; and the equimax combines the two previous methods (Grande and Abascal, 2017). In the present study, PCA was processed using the varimax method.

The PCA technique consists of two phases: 1. Compliance with requirements: It was evaluated by the observation of random errors in the survey and the results were: The original variables must be correlated. (0.88) is found. The determinant of the correlation matrix must be close to zero. (0.0000409) is found. The Bartlett sphericity test evaluates the presence of non-zero correlations between all variables and the larger the work statistic it is highly significant. (11697.1) is found. The anti-image correlation matrix represents the degree to which the PCA factors explain each of the results and is measured because the correlations of the diagonal must be high (greater than 0.85), and the others must be lower (less than 0.10). (0.92) is found. The Kaiser-Meyer-Olkin index must be greater than 0.80. (0.88) is found. Consequently, all the prerequisites for the application of the PCA are met.

The PCA estimation is based on two elements: the factors and the explained variance. The factors are given by the SQ theory raised by Parasuraman, Zeithaml and Berry (1988) and by Cronin and Taylor (1992), which indicate that the factors are five: tangible elements, reliability, responsiveness, security and empathy. The explained variance is the contribution of the questions in the explanation of the problem. The results of the PCA factors using the varimax method by the SQ of the company were 6 factors that explain 51.60% of the problem. Research carried out by Cronin and Taylor (1992) using the SERVPERF scale for various services explains the following percentages of the explained variance: banks (41.10%), gyms (57.50%), laundry (42.60%), and fast food (29.10%). This means that the current scale to measure the SQ of the company is significant and better explains the problem of the SQ raised by Cronin and Taylor (1992), and by Montaña, Ramírez and Ramírez, (2002), because the explained variance was 46.80% with three factors. It should be noted that the result was lower than those obtained by Gallegos, Robles and Ahumada (2018: 64.50%) in their study on SQ of drinking and sewage water carried out in Mexico.

The six (6) dimensions of the SQ found in the company are specified below, which explain 51.60% of the variance.

Factor 1. Reliability (30.50%). It relates to the variables: The offices are easy to find, the company sign is visible from afar, the entrance to the customer service office is easily accessible, the personnel who make the repairs are identified with the logo of the company, the facilities are clean, they are identified clearly, illuminated, the shift system is easy to operate, the company delivers payment receipts on time, the company delivers payment receipts without errors, service at the payment sites is good, employees give individualized attention to users, the schedule of the payment sites is broad, the payment sites are safe, the staff is trained to solve the problems of the customers, the employees inspire confidence, the cleaning service collects the garbage in a timely

manner, I agree with the garbage collection schedule, the cleaning service people use the protection elements and the cleaning service people sweep the streets of the city well.

Factor 2. Empathy (7.50%). It relates to the variables: The customer service waiting room is very comfortable, the office staff is well identified, the company has new equipment, the facilities are spacious and beautiful.

Factor 3. Facilities (4.10%). It relates to the variables: It is easy to communicate with the company, the staff provides adequate information to the users, the employees are concerned about providing solutions to the users' complaints, the employees are courteous, the staff makes good recommendations to the customers, accountants are easy to contact and the consumer feels confident with the jobs the company does.

Factor 4. Installations I. (4.00%). It is related to the variables: The company communicates the suspension of services in time, the prices of the services offered by the company are reasonable, the staff has time to answer questions, the company answers for those damaged by landfill clogging rainwater, the company's website is easy to navigate, staff resolves customer complaints promptly, and bills are easy to pay.

Factor 5. Response capacity (2.80%). It relates to the variables: The company has an attractive website for complaints and claims, the company makes prompt repairs when there is damage, the price of the services provided by the company is reasonable, the water service seldom fails and the price charged for the cleaning service is reasonable.

Factor 6. Installations II (2.70%). It relates to the variables: The company offices are easy to find, the company sign is visible from afar, the entrance to the customer service office is easily accessible, the customer service waiting room is very comfortable, and the office staff is well identified.

From the PCA analysis, it is concluded that the resulting factors do not correspond in their entirety to the SQ theory formulated by Parasuraman, Zeithaml and Berry (1988) and by Cronin and Taylor (1992), because the number of variables was expanded from 22 to 47 and by possible cultural patterns of peoples. It is essential to note that the survey applied has high reliability and validity (Cronbach's alpha of 0.89) and the minimum accepted load was 0.38.

Conclusions

The present investigation evaluated the quality of the service of the company by processing 702 stratified surveys. To achieve this, the SERVPERF scale proposed by Cronin & Taylor (1994) was used. The results indicate that the scale obtained is a reliable and valid instrument to measure perceived quality (Cronbach's alpha of 0.89). They also show that the instrument used has content, pragmatic and concept validity, which explains 51.60% of the variance, through six factors, namely: Trust (30.50%), Empathy (7.50%), Facilities (4.10%), Installations I (4.00%), Responsiveness (2.80%), and Installations II (2.70%). The results are superior to those obtained by Cronin & Taylor in the United States (1992) on QS because they found the following Cronbach

alphas: banks (0.89), gyms (0.90), laundry (0.09), and fast food (0.85). They were also superior to the study carried out in the same Company by Montaña, Ramírez and Ramírez (2002) with 46.80% of explained variance and alpha of 0.88; but lower than those obtained by Gallegos *et al.* (2018: 64.50%) in their study on SQ of drinking water carried out in Mexico.

The results of the QS of the company could not be compared with other studies that proposed the SERVQUAL model because they only obtained averages and did not calculate Cronbach's alpha: Benítez (2016, Peru: perceptions oscillate between 2.40 and 2.90); Tenesaca (2019, Ecuador: 28 employees surveyed and found dissatisfaction gaps in all dimensions, -1.52); Arroyo and Eufracia (2019, Peru: 183 interviewed and concluded that there is a positive relationship between SQ and customer service).

The image of the company was 3.50/5.00, which indicates a satisfaction of 70.00%. The variables that contributed the most to user satisfaction were I trust the work that the company does, the staff has time to answer the questions, the cleaning service people sweep the city streets well, and the price of the cleaning service is reasonable. Likewise, the variables that contributed the least to user satisfaction were Invoices are easy to pay, the staff is trained to solve customer problems, and the company's service hours are comprehensive. The results of the multiple regression model were good because the correlation coefficient was higher than 0.40 (0.72) (Grande and Abascal, 2017).

The evaluation of the current loyalty of the company was 3.20/5.00, which indicates a current loyalty level of 64.00%. The variables that most influenced the evaluation of loyalty were: I trust the work that the company does, the water service seldom fails, the company communicates the suspension of services in advance, and the website of the company is easy to navigate. The results of the multiple regression model on current loyalty are good because the correlation coefficient was greater than 0.40 (0.63) (Grande and Abascal, 2017).

The evaluation of the future loyalty of the company was 3.50/5.00 which indicates a level of future loyalty of 70.00%. The factors that most influenced the evaluation of the future loyalty of the public companies were: The staff makes good recommendations to customers, the company has an attractive website for complaints and claims, and it is easy to communicate with the company. The results of the multiple regression model on future loyalty are good because the correlation coefficient was greater than 0.40 (0.62) (Grande and Abascal, 2017).

When performing the indicated statistical analyzes, the following significant correlations were found (alpha less than 0.05) between sociodemographic characteristics and service quality factors: educational level with security; marital status with empathy, number of children with tangibility, reliability and empathy; stratum with tangibility, reliability and empathy.

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