Evaluation model about behavior, quality perception and satisfaction of the drinking water service in Trujillo- Peru

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ABSTRACT

The present research had as an objective to develop an evaluation model about behavior, quality perception and user´s satisfaction of the drinking water service regarding the drinking water service in Trujillo - Peru in the year 2018. The population was made up of the inhabitants with drinking water connections in the district of Trujillo that make a total of 62,166. The sample was made up of 651 people who reside in the district. The applied technique was the survey and the instrument was the questionnaire, which includes the user´s characterization, the user´s environmental behavior, either connected or not connected to public network. The results obtained were the habits and/or customs in the use of water by the users of the drinking water service and 14% believe that it is convenient; as far as the repairs on the public network in the users of the drinking water service, 92% do it externally and in relation to the sanitary guarantee in the drinking water by the users of the drinking water service, 61% consider it moderate. It is concluded that there is an optimal evaluation model about behavior, quality perception and user´s satisfaction regarding the drinking water service in Trujillo-Peru-2018.
Keywords: Evaluation, behavior, quality perception, user´s satisfaction, water.

1. INTRODUCTION

Users' perception is of vital importance for a company; before that they must focus their efforts to identify how to achieve their user's satisfaction.

Defining the quality of the service and how to evaluate it depends on the observer's point of view. For this reason, there are controversies among authors; however, in the proposal we used the systemic approach of company, university and society represented by water users. [1].
Many users of the liquid element (water) do not have priority to comply with the payment of their water bill. [2].

In La Libertad region, the company that provides drinking water serves thirteen localities: El Porvenir, Trujillo, Víctor Larco, La Esperanza, Florencia de Mora, Huanchaco, Moche, Salaverry, Puerto Malabrigo, Chocope, Paiján, Chepén and Pacanguilla, whose coverage reaches 86.08% of the population. That means that the remaining 13.22 % lacks the attention of the liquid element for the human being.

Regarding the factors associated with the quality of drinking water service, 76.1% are in the medium level, 19.38% are satisfied and 4% are dissatisfied, while 74.8% have a regular perception regarding the quality of service; concluding that there is an average satisfaction and regular perception (62.2%) and that the factors analyzed have a significant relationship with the perception of quality. [3].

Public services are currently one of the fastest-growing sectors worldwide, and over time this has become an important aspect of development for all countries. Also, the ease of the digital age and the internet allows customers easy access to be informed by giving them the choices they need and how to meet their respective needs. [4].

In Trujillo, the fundamental problem is the shortage of drinking water supply due to the rupture of the mother canal of the Chavimochic Special Project which has affected 426,000 users in this province of La Libertad. Districts such as La Esperanza, Florencia de Mora, El Porvenir and part of Huanchaco (El Milagro) and Trujillo are affected by water shortages and the rupture of the pipes. For this reason, the main goal of this research was to determine an evaluation model about behavior, quality perception and user´s satisfaction regarding the drinking water service in Trujillo. This allowed us to know the aspects to evaluate among the main actors that provide and receive this service and, at the same time, with the results to be obtained to offer the possible alternatives of solution so that the water resource is to the availability of the inhabitants and they can carry out their basic necessities inside their homes and that the company can offer a better service of quality and attention to their clients as well as the opportunity of improvement in relation to the personnel that has communication with the users, and also to offer the suitable information in relation to the complementary services, consultancy and insurance. information in relation to the complementary services, consultancy and insurance.

The research was applied to a population of 738 people residing in the district. The applied technique was the survey and the instrument was the questionnaire to develop the Model of evaluation on behavior, quality perception and user´s satisfaction of the drinking water service regarding the drinking water service in Trujillo - Peru in the year 2018. This questionnaire was validated by experts. The results obtained were the habits and/or customs in the use of water and the drinking water service where 14% believe that it is convenient; as far as the repairs on the public network in the users of the drinking water service, 92% do it externally, and in relation to the sanitary guarantee in the drinking water in the users of the drinking water service, 61% consider it moderate. It is concluded that there is an optimal evaluation model about behavior, quality perception and user´s satisfaction regarding the drinking water service in Trujillo-Peru-2018.

2. OBJECTIVES

General

To determine the evaluation model about behavior, quality perception and user´s satisfaction of the drinking water service in Trujillo.

Specific

To evaluate users' behavior regarding water quality.

To analyze users' perception of water quality with respect to drinking water service.

To analyze user's satisfaction in relation to the sanitary sewerage service in Trujillo

3. MATERIAL AND METHODS

According to the design, the research is explanatory. In the case study the population was 62166 and a sample of 738 people calculated with the formula for finite population with a 95% confidence level, a success rate of 19% obtained from a similar research previous to ours, and an adjusted error of 4.9%.

Sampling: The sampling was carried out by strata, considering the following sectors

Sectors	No.	Records	Sample size
901	440	0.00707782	5
902	3202	0.05150725	38
903	5403	0.08691246	64
904	2766	0.04449377	33
905	2508	0.0403436	30
906	2368	0.03809156	28
907	3323	0.05345366	39
908	2710	0.04359296	32
909	4044	0.06505164	48
911	2923	0.04701927	35
912	2130	0.0342631	25
913	1744	0.02805392	21
914	3258	0.05240807	39
915	4248	0.06833317	50
916	4959	0.07977029	59
917	2418	0.03889586	29
918	1371	0.02205386	16
919	2239	0.03601647	27
920	2051	0.03299231	24
921	579	0.00931377	7
922	2152	0.03461699	26
924	4150	0.06675675	49
923-925	1180	0.01898144	14
	62166	100%	738

Data collection techniques and instruments

The technique used was the survey and the instrument was the questionnaire about user behavior and drinking water quality of service in Trujillo-Peru-2018 (See Annex N°01). It is made up of three parts:

Part I: Characterization of the user.

Part II: Behavior of the connected, not connected user to the public network and for all.

Part III: Perception of quality and user's satisfaction that includes problems with the water and sewer service that are present, the perception of quality with respect to water service, sewer service and the care provided by the service company, user's satisfaction with respect to water service and sanitary sewerage.

Methods of data analysis

Descriptive statistics, statistical tables and graphs, SPSS version 25 Amos were used to model structural equations that allow us to support our research by extending standard multivariate analysis methods to create models of behavior and attitudes that more accurately reflect complex relationships than standard multivariate statistical techniques through an intuitive programmatic or graphical user´s interface.

4. RESULTS

Behavior

Table 1
Frequency of drinking water Behavior by potable water service Users in Trujillo-Peru-2018

Frequency	Nº	%
Adequate	103	14%
Inadequate	635	86%
Total	738	100%

Table 2

Frequency of drinking water use by potable water service users in Trujillo- Peru-2018

Frequency	Nº	%
A lot	150	20%
Moderate	372	50%
Normal	216	29%
Total	738	100%

Table 3

Repairs in public network by users of drinking water in Trujillo- Peru-2018

Repair	Nº	%
External	678	92%
Service Company	60	8%
Total	738	100%

Perception of quality

Table 4

Sanitary guarantee of drinking water in users of drinking water service in Trujillo- Peru-2018

Guarantee	Nº	%
Good	248	34%
Moderate	453	61%
Normal	37	5%
Total	738	100%

Table 5
Cost of drinking water service in users of drinking water service in Trujillo- Peru-2018

Frequency	Nº	%
High	341	46%
Normal	397	54%
Total	738	100%

Table 6
Evacuation of water used by users of drinking water services in Trujillo - Peru-2018

Evacuation	Nº	%
Bad	461	62%
Very Bad	64	9%
Total	738	100%

Table 7
Individualized attention of drinking water by the users of drinking water service in Trujillo- Peru- 2018

Attention	Nº	%
Eficient	511	69%
Inefficient	227	31%
Total	738	100%

Satisfaction of quality

Table 8
User's satisfaction regarding the drinking water service in Trujillo- Peru-2018

Satisfaction	Nº	%
Very satisfied	131	18%
Satisfied	414	56%
Dissatisfied	132	18%
Very dissatisfied	61	8%
Total	738	100%

Table 9
User's satisfaction regarding the sanitary sewerage service in Trujillo- Peru-2018

Satisfaction	Nº	%
Very satisfied	158	21%
Satisfied	316	43%
Dissatisfied	160	22%
Very dissatisfied	104	14%
Total	738	100%

Table 10
User's satisfaction regarding the attention of the drinking water service in Trujillo- Peru-2018

Satisfaction	Nº	%
Very satisfied	40	5%
Satisfied	262	36%
Regulary Satisfied	336	46%
Dissatisfied	83	11%
Very dissatisfied	17	2%
Total	738	100%

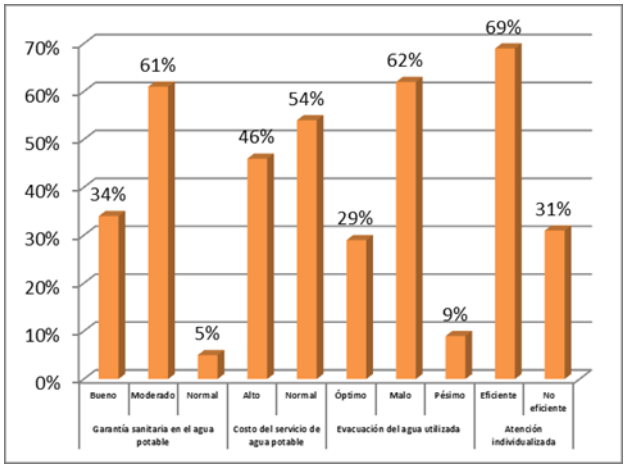

Figure 1: Quality Levels the drinking water service in Trujillo – Peru - 2018

Amos Model

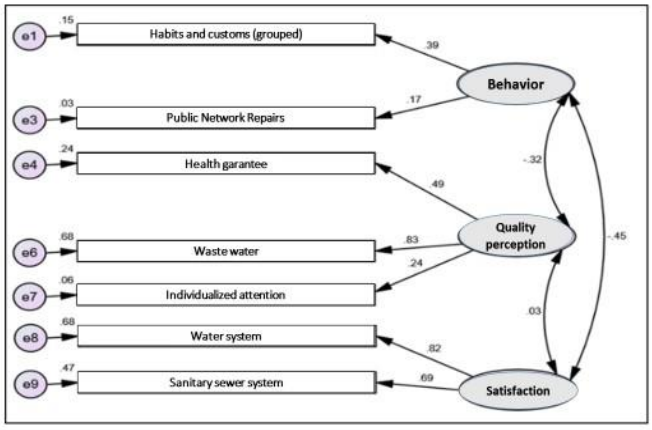

Figure 2. Three-factor model related to ten indicators

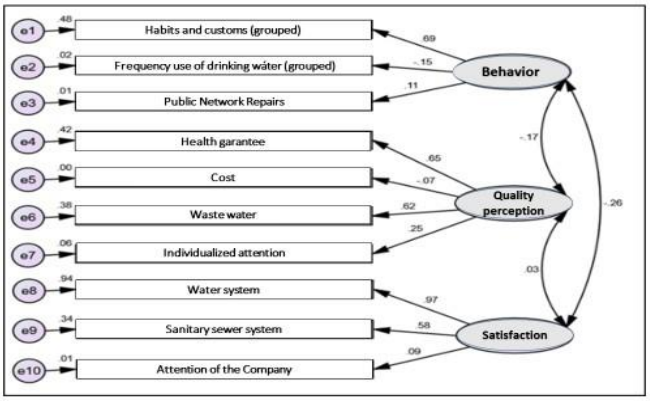

Figure 3. The Model proposal is presented, which would have three factors related to seven indicators.

5. DISCUSSION

The main objective of this research was to determine an evaluation model about the user's behavior, perception of quality and satisfaction regarding the drinking water service in Trujillo and we found that with regard to the behavioral dimension in Table 1 the habits and/or customs in the use of the drinking water service, 14% have adequate habits while 86% have inadequate habits. In Table 2, regarding the frequency of the use of the drinking water service, in 50% it is moderate and in 20% it is a lot. In Table 3, with respect to repairs in the public network in users of the drinking water service, 92% do so externally and 8% use the company's service. In Table 4, regarding the sanitary guarantee in the drinking water service, 61% consider it moderate and 5% consider it normal. An investigation was carried out in order to know the perception of the Federal District inhabitants about the quality of the drinking water service, as well as their willingness to pay a higher rate, and their consumption habits. Among the main results of the survey, it was reported that 96% of households have piped water and 82% receive it every day, but there is a high perception that water is scarce. Although the interviewees consider water to be the second most important public service and the one for which they pay the least, they do not perceive it as the cheapest and they are reluctant to increase the tariff. There is inequality in the perception of service quality among socio-economic strata and among delegations. Finally, the perception of such quality encompasses all aspects of the service, from the supply conditions to the service in the operator's offices, as shown in Tables 1 and 2. [6].

Based on the dimension perception of quality regarding the drinking water sanitary guarantee in the users of the drinking water service, 61% consider it moderate and 5% consider it normal; with respect to the cost of the drinking water service in Table 5, 54% of the users consider it high and 46% consider it normal. Likewise, González, Aguirre and Lartigue (2016) conducted a quantitative research and concluded that there is a reluctance on the part of the population to increase the water resource tariff and there is inequality among the population of the

different social strata.It could be assumed that the moderate type Perception is due to the treatment of water for human consumption by the company, because being a vital and important resource for the population it ensures that this type of water quality be suitable for human consumption. Regarding the evacuation of water used in users of drinking water services in Trujillo, in Table 6, 62% consider it bad and 9% very bad, and in Table 7 regarding individualized attention to drinking water in users of drinking water services, 69% believe that it is efficient and 31% that it is not efficient.

In Table 8, regarding user's satisfaction with drinking water service, 56% are satisfied and 8% dissatisfied. These results are similar to those reported by Márquez and Ortega who conducted a quantitative investigation in the state of Veracruz in which the population was all the inhabitants of the city of Xalapa. The technique used was the survey and the instrument the questionnaire; the sampling used was of a probabilistic type, concluding that the population is dissatisfied with the high water rates as well as the lack of water resource supply. This would be because users would be willing to pay a higher value for the water service in order to receive a better quality product. In this same category, respondents believe that by improving the quality of water used for human consumption, the risk of contracting diseases is reduced, as shown in Tables 6, 7 and 8. [7].
In Table 9, 43% of users are satisfied with the sewerage service whereas 14% are dissatisfied. These results are similar to those reported by Alvarado, Rodríguez and Iturralde who analyzed the distribution of the infrastructure of the drinking water and health systems in the state of Nuevo León, in which the municipalities with the greatest social marginalization (without drinking water or access to health services) tend to present the worst health outcomes. Therefore, it is assumed that there could be an unequal distribution of material and human resources in the drinking water and health systems, since there is a high concentration of these resources in the metropolitan area and the consequent neglect of the peripheral municipalities. [8].

In table 10, in terms of user satisfaction with the provision of drinking water service, 46% are regularly satisfied, 11% are dissatisfied and 2% are very dissatisfied. Thus, Lascuráin (2012) conducted a qualitative descriptive research, concluding that problem solving is one of the most important factors which directly affects long-term satisfaction. [9]. Data are also provided regarding the economic and social assessment of the drinking water service which can be used to improve the city's service. The most outstanding results show that for the inhabitants of the city the amount to pay for a better water service expresses the social and economic value of this vital resource. On the other hand, the probability that someone accepts a payment for improving the service is greater when the respondent is a woman. In addition, as with environmental goods, the water service for the homes of the city has a normal characteristic. However, the proportion of families that responded with a "yes" in their willingness to pay being higher in the low income range. [10]

When evaluating the proposed model using the AMOS software, the indicators include habits and customs, repairs in the public network for the dimension Behavior, health guarantee, wastewater and individualized attention for the perception of quality and water and sanitary sewer service for Satisfaction, deciding to eliminate from the model the indicators Frequency of use of drinking water, Cost and Service of the company that provides service due to having less standardized factorial load and positions to be evaluated through the Satorra-Bentler test. Each model focuses the evaluation on the different aspects of the organization of education and in function to its processes, being the purpose of the model to measure the level of location of an institution or company that seeks quality. [10]. Finally, a simple and practical methodology was reported that allows the selection of the internal services that will evaluate and improve, identify clients, develop, apply instruments and mechanisms for the assessment of the level of service and finally, carry out improvement actions. [11]..

6. CONCLUSIONS

The water is a principal service to life of human being. With this work, the research team do their contribution analizing the indications and suggesting a model to evaluate the dimensions of behaviour, quality and user satisfaction in relation to potable water service.

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