








Evaluation of the Quality of Services in a Public Health Center in Metropolitan Lima using the SERVQUAL Model

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I. INTRODUCTION

Abstract: *Despite various efforts by medical and support personnel to improve service levels, deficiencies remain across all dimensions of the SERVQUAL model. This research aims to identify gaps in service quality at a health center in Metropolitan Lima and to determine priority areas for improvement. A descriptive and cross-sectional method was used, employing the SERVQUAL model as the primary instrument. Simple random sampling was applied, resulting in a sample of 267 patients who evaluated their experience in the service line. Service quality gaps were calculated, and improvement opportunities were analyzed using the IPA method. Gap projections were visualized through boxplot graphs. The findings indicate that patients are not satisfied with the services provided by the health center; the dimensions with the largest gaps are empathy (-0.77) and reliability (-0.76), both related to long waiting times and lack of information about the care process. This study reports results similar to those found in Ghana, Tanzania, and Jordan, where negative gaps were also associated with support processes. These findings underscore the need to redesign processes and improve areas related to admission and information. The article also highlights the importance of using validated models to identify improvements in healthcare services, as well as the need to implement advanced tools or technologies to optimize the patient's experience.*

Keywords: *Quality of services, SERVQUAL model, Patient perception*

The COVID-19 pandemic is considered a disruptive event in the global context that triggered a crisis across various economic sectors in different countries [1]. The health sector was particularly vulnerable due to the increased demand and insufficient capacity to attend to all patients. In other sectors, such as public transportation in Thailand, service management had to change in response to passenger resistance and mistrust, with health control being prioritized [2]. The pandemic also had a significant impact on hospitals in Jordan, where the imposed restrictions heightened dissatisfaction with intrapartum care services, further increasing the challenges faced by public institutions in meeting patient needs [3]. The quality gaps in services were worsened by the pandemic and the existing budget constraints of public institutions, making it crucial to identify these gaps to implement result-based improvements that positively impact patients in medical centres. This can be achieved using models validated both theoretically and practically, such as the SERVQUAL model.

The SERVQUAL model has been widely applied across various sectors. For instance, in one study [4], it was used to assess the quality of rail services and health concerns post-pandemic by analyzing users' intentions to use trains. In another study [5], the model was applied to evaluate the perceptions and expectations of patients at a hospital in a Ghanaian community. Similarly, research conducted in Jordan [6] aimed to evaluate women's perceptions of intrapartum care quality in public and private health facilities, with findings indicating negative service quality gaps. A study in Taiwan [7] employed the SERVQUAL model in a medical center focusing on oral health patients, aiming to reduce dental injuries caused by anaesthesia. Here, most of the identified gaps were negative, mainly due to long waiting times and insufficient patient information. In Tanzania [3], the SERVQUAL model was used in a public health center to identify challenges and evaluate service quality within such institutions.

Public health services are a priority across all regions. Ensuring access to quality care is a fundamental human right. Therefore, it is essential to understand patients' perceptions of

the services provided by public medical centers in order to develop specific strategies that address the issues identified in this research.

II. THEORETICAL FRAMEWORK

A. Model SERVQUAL

SERVQUAL is a model that allows measuring the quality of the service offered by an organization. This is possible by evaluating two components: customer expectations and perceptions. Its five-dimensional design makes it possible to classify all aspects of an organization into key objectives. It was originally developed based on 10 dimensions that would later be synthesized into just five: 1) Tangible: The tangibility of an organization includes the appearance of its physical facilities, equipment, materials, as well as personnel [8], [9]. This implies that the spaces are clean and comfortable, there is modern equipment and materials, and trained personnel; 2) Reliability: Reliability refers to providing consistent and accurate service as promised [9]. This includes the fulfillment of the service in the promised time, being punctual and careful; 3) Responsiveness: Responsiveness implies acting proactively, with a willingness to help and provide a fast and adequate service [8], [9]. Even in tense moments or when dealing with difficult customers, you must be willing to address their doubts; 4) Security: Security encompasses skills, knowledge, and courtesy to convey trust and credibility to customers [8], [9].

B. Importance of Performance Analysis (IPA)

The IPA analysis, originally developed by [10], is a visual matrix used to evaluate the importance and performance of the attributes of a service or product. The IPA classifies the evaluated items into four quadrants, which facilitates the identification of an organization's strengths and weaknesses. This allows actions to be executed and resources to be prioritized strategically [11]. Classification of items into quadrants: 1) Quadrant I (High perception, high expectation): These are items with good balance, and the strategy is to maintain them; 2) Quadrant II (High perception, low expectation): These are items with high perception but low importance to customers, representing strengths; 3) Quadrant III (Low perception, low expectation): These are items with low priority; 4) Quadrant IV (Low perception, high expectation): These are items that must be improved. Quality in health centres depends on infrastructure, equipment, and the perception of accessibility by the user [12]. It is emphasized that the management of a health centre requires staff to possess soft skills such as empathy, responsiveness, and a focus on general patient satisfaction. In the research of [13], a significant proportion of users avoid attending health centres due to lack of guidance and long waiting times. The research of [14] evidenced that poor communication and lack of courtesy generate 60% of dissatisfaction, proposing effective management of soft skills.

III. METHODOLOGY

A. Methodology

The research is descriptive and cross-sectional, similar to studies related to the SERVQUAL model [5]. This methodology involves the collection and evaluation of data, allowing the identification of correlations, trends, and patterns between variables [15], by analyzing the gaps between users' expectations and perceptions, which provides an updated diagnosis of the services offered by a public medical centre. The research was conducted at a specific time, during the last week of November 2024 and the first week of December 2024, allowing us to capture the perceptions corresponding to that period.

B. Data collection

Data collection was carried out between November and December 2024 in a medical centre in Metropolitan Lima. For the selection of patients, simple random sampling was used, where each patient had the same probability of being chosen [16]. This approach was adopted due to restrictions encountered during data collection, the main one being the refusal of some patients to participate. This type of sampling helped reduce the logistical burden of the process, enabling the collection of a greater amount of data without compromising the randomness of the study. The sample size was calculated based on the following parameters: p and $q = 0.5$, a confidence level of 95% ($\alpha = 0.05$), and a maximum allowed margin of error of 6%. The calculated sample size was 267, while the actual number of respondents collected in the study was 333 [17]. Before administering the questionnaire, patients were informed about the objective of the research, and their consent was obtained. The instrument used was the SERVQUAL model, which, through its five dimensions—tangibles, reliability, responsiveness, assurance, and empathy—allows the identification of service quality gaps and critical areas for improvement by evaluating each component [5]. The questionnaire consists of two parts: the first gathers general demographic information from the patient, and the second addresses their expectations and perceptions regarding services at the health posts. The questionnaire is based on a Likert-type ordinal scale (1 to 5), ranging from “Not expected” to “Highly expected” for expectations, and from “Not at all satisfied” to “Very satisfied” for perceptions. Reliability was measured using Cronbach's alpha, which assesses the internal consistency of item responses, indicating whether the result is repeatable regardless of the time of measurement within the same population [18]. In this study, Cronbach's alpha was calculated by dimension.

Table No. 1 Instrument reliability

Dimension	Cronbach's Alpha (Expectations)	Cronbach's alpha (Perceptions)
Tangible Elements	0,85	0,87
Reliability	0,88	0,89
Responsiveness	0,82	0,83
Safety	0,9	0,91
Empathy	0,84	0,86

Calculation of the quality of services (QS):

The calculation of service quality is performed by subtracting the average of expectations from the average of perceptions for each dimension or item, and then dividing the result by the number of cases [19]

C. Statistical analysis

The questionnaire was processed using Google Forms, and once downloaded, the database was worked on using Excel. The preprocessing of the database, including the handling of missing data, was performed in Python using the *Missing* library, which is designed to analyze missing data. After detecting the missing values, imputation was carried out using the KNN method, a non-parametric technique based on nearest neighbors that is considered robust, as it does not assume any specific distribution of the sample. For descriptive analyses such as the calculation of the mean, error, and other statistics, Python libraries such as *pandas* and *matplotlib* were used. The visualization of intervals was carried out using boxplots, allowing a visual projection of quartiles and the range of confidence intervals.

IV. RESULTS

Demographics

The study involved 333 participants, most of whom were women (69.7%). A total of 54.4% had completed secondary education, and the average age was 34.7 years. Regarding employment, 38.7% were housewives, while another 38.7% were employed in public services.

Table No. 2: Demographic composition of the sample

Variable	Group	Count	Percentage
Sex	Female	232	69,7%
	Male	101	30,3%
Level	Primary	29	8,7%
	Higher University	52	15,6%
	High school	181	54,4%
	Technical Superior	69	20,7%
	Illiterate	2	0,6%
Occupation	Housewife	129	38,7%
	Other	125	37,5%
	Public Entrepreneur	56	16,8%

Type	Public official	23	6,9%
	Recurrent	296	88,9%
Age	New	37	11,1%
	[79, 84)	7	2,1%
	[29, 34)	39	11,7%
	[54, 59)	28	8,4%
	[64, 69)	20	6,0%
	[19, 24)	27	8,1%
	[49, 54)	24	7,2%
	[34, 39)	40	12,0%
	[44, 49)	28	8,4%
	[39, 44)	39	11,7%
	[24, 29)	29	8,7%
	[14, 19)	8	2,4%
	[59, 64)	19	5,7%
	[69, 74)	14	4,2%
	[74, 79)	8	2,4%
	[84, 89)	3	0,9%

According to the evaluation provided by the patients participating in the study, a service quality level of $QS < 0$, as shown in Table No. 3, indicates that public health services in medical centres across Lima are failing to meet patient expectations across the five key SERVQUAL dimensions: tangibility, reliability, responsiveness, assurance, and empathy. Similar results were observed in a municipality in southwestern China, as reported by [20].

Table No. 3: Gaps by demographic groups

Variable	Group	Average Gap	Standard Error
Sex	Female	-0,68	0,02
	Male	-0,58	0,02
Level	Primary	-0,8	0,05
	Higher University	-0,7	0,04
	High school	-0,63	0,02
	Technical Superior	-0,61	0,03
	Illiterate	-0,95	0,21
Occupation	Housewife	-0,68	0,02
	Other	-0,74	0,02
	Private Entrepreneur	-0,5	0,03
	Public official	-0,39	0,04
Type	Recurrent	-0,68	0,01
	New	-0,42	0,04
Age	[79, 84)	-0,57	0,08
	[29, 34)	-0,67	0,04
	[54, 59)	-0,77	0,05

[64, 69)	-0,65	0,05
[19, 24)	-0,61	0,04
[49, 54)	-0,87	0,05
[34, 39)	-0,59	0,04
[44, 49)	-0,69	0,05
[39, 44)	-0,59	0,04
[24, 29)	-0,72	0,05
[14, 19)	-0,64	0,08
[59, 64)	-0,59	0,06
[69, 74)	-0,5	0,07
[74, 79)	-0,62	0,09
[84, 89)	0,03	0,12

To have estimates of the gaps or Quality of services, a graph of boxes and whiskers was prepared with an estimation based on a confidence level of 95%

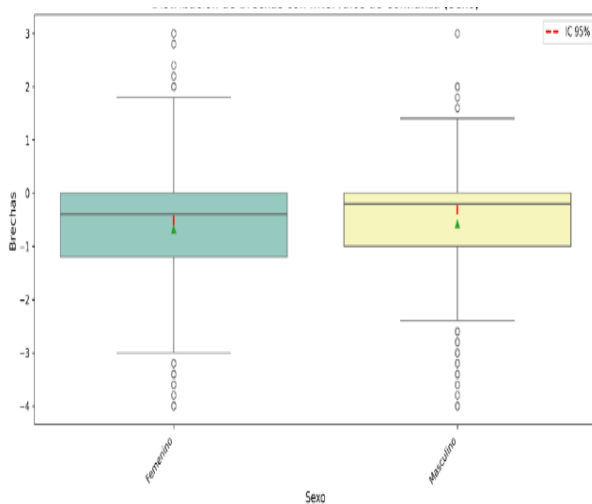


Fig. 1: Boxplot of gaps according to gender

At both the male and female levels, 75% are not satisfied with the services perceived

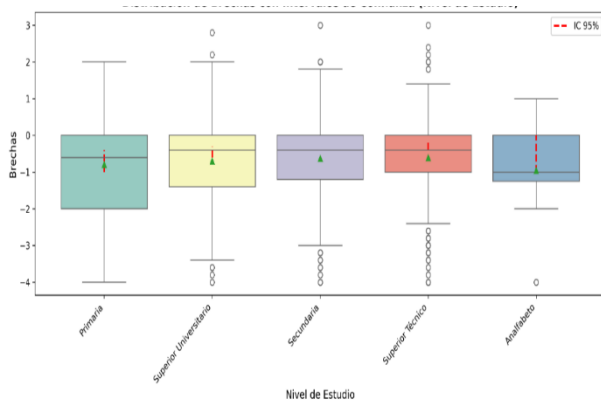


Fig. No. 2 - Boxplot Gaps according to the level of study

In the case of the level of education, it is repeated at all levels, 75% are not satisfied with the level of service.

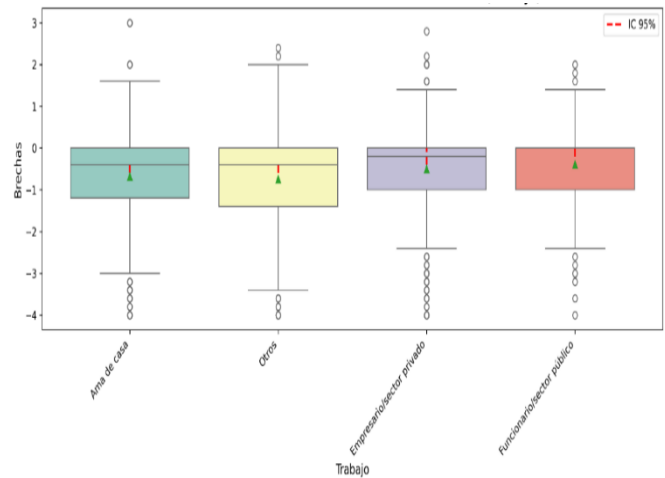


Fig. No. 3 - Boxplot Gaps according to occupancy.

In terms of occupancy, also in all demographic groups, 75% are not satisfied with the service received.

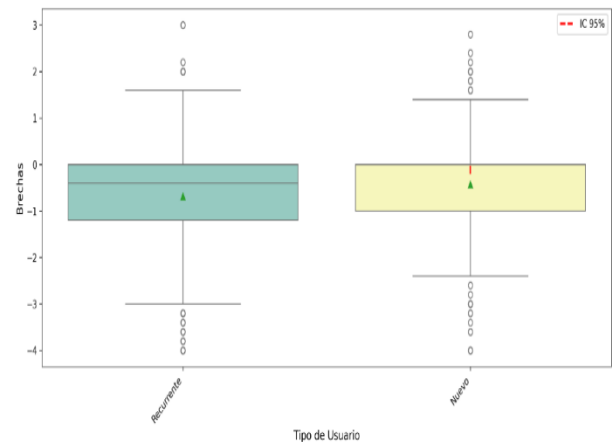


Fig. No. 4 - Boxplot Gaps According to User Type

The type of user: 75% is not satisfied with the service received.

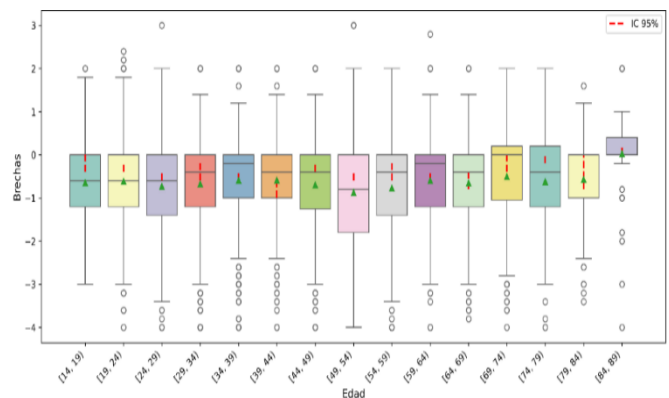


Fig. No. 5 – Users by age range

IV. DISCUSSION

IPA Analysis (Importance Performance Analysis)

Table No. 4. The gaps or quality of services by dimensions, the table presents the results obtained in the expectations and perceptions for each item, and the quality-of-service gap (QS)

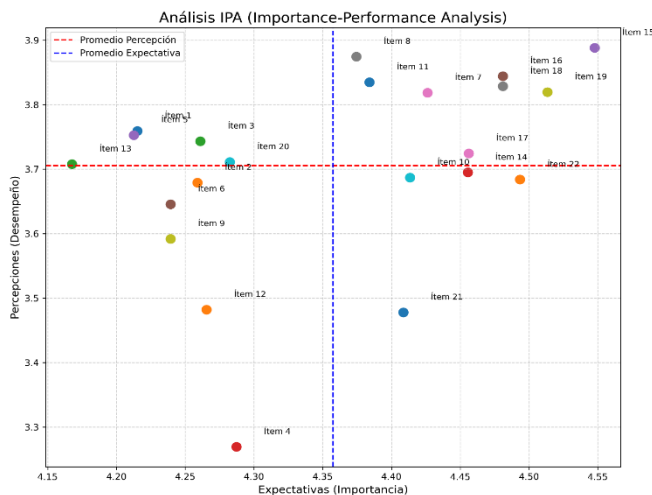
Table No. 4. Gaps by dimension

Dimension	QS (Quality Score)	Standard Error
Tangible Elements	-0,5178	0,0542
Reliability	-0,7677	0,0455
Responsiveness	-0,5268	0,0487
Safety	-0,7435	0,0507
Empathy	-0,7707	0,0497

As shown in the Importance-Performance Analysis (IPA) matrix (Fig. No. 6), the items located in quadrant I (high perception, high expectation) are items 7, 8, 11, 15, 16, 17, 18, and 19. These elements are considered critical strengths and should be maintained. Items in quadrant II (high perception, low expectation) include items 1, 3, 5, 13, and 20; although these represent areas of good performance, they are perceived as less important by users. Quadrant III (low perception, low expectation) includes items 2, 4, 6, 9, and 12, which are considered secondary and do not have a significant impact on medical care. Finally, quadrant IV (low perception, high expectation) comprises items 10, 14, 21, and 22, where patients report high expectations but low perceived quality. These represent critical areas for improvement.

Table No. 4 identifies that all the gaps or QS that are negative can be considered as possibilities for improvements in the service of the medical post.

Fig. No. 6. IPA Analysis



In the research conducted by [2], the gaps obtained were negative, with the smallest differential related to cleanliness. However, the largest differential was associated with the management of medical services, which is consistent with the findings of this study and suggests a need for better and more comprehensive preparation of administrative support staff.

In the study by [5], carried out in a private hospital in Ghana, the widest gaps were related to the communication of results, particularly the explanation of diagnoses and procedures, tasks primarily performed by medical support personnel. In the Peruvian context, this aspect is both valued and considered an indicator of trustworthiness.

According to the research conducted by [6] in both public and private health facilities, the most significant gaps were found in the dimensions of empathy (related to patient care) and responsiveness (related to addressing patients' needs). These findings are similar to those observed in Lima, where deficiencies in processes related to support staff were more pronounced.

In the study by [7], the negative gaps identified were primarily associated with processes before medical care, such as waiting time and lack of information, results that align with previous studies.

The research by [3] concluded that medical services in Tanzania do not meet patients' expectations, which is also reflected in the findings of this study conducted in Lima, Peru.

These findings are consistent with studies from Ghana, Jordan, and Tanzania, where similar service gaps were observed in administrative processes, communication, and waiting times. Particularly, the dimensions of empathy and reliability exhibited the most pronounced gaps, highlighting a disconnect between patient expectations and operational processes. Such results call for a redesign of healthcare processes and the adoption of a culture of continuous improvement.

Technology has shown disruptive potential in healthcare. For instance, the implementation of eHealth platforms has enabled better scheduling and management of primary and secondary care appointments [21]. In the study by [22], the use of electronic health records, clinical decision support systems, and artificial intelligence is highlighted as a means to improve workflow and efficiency. These technological solutions underscore the viability of automating administrative processes and digitizing patient interactions.

V. CONCLUSION

During the COVID-19 pandemic, public health institutions in Peru, such as medical posts, demonstrated vulnerabilities and logistical deficiencies within their organization. This research aims to identify opportunities for improvement in public health facilities. The study revealed service strengths such as the attentiveness of medical staff and the empathy perceived from healthcare support personnel, including nurses and other auxiliaries, which contribute to the proper delivery of care in consultation settings.

However, the areas requiring improvement that negatively affect the overall perception of the service are related to administrative support, including the lack of an information system that informs patients about their care process or staff assigned to notify them about upcoming appointments.

Among the limitations identified in medical posts, improving the level of service requires an administrative process redesign, including the digitization of medical records, scheduling of medical appointments through mobile applications or web platforms, and the visualization of queue status for appointments. These measures could enhance service quality. It is also recommended that the findings of this research be used to prioritize the necessary institutional improvements

REFERENCIAS

- [1] S. Durst, A. Svensson, and M. M. G. P. Acuache, "Peruvian small and medium-sized enterprises in times of crisis—Or what is happening over time?," *Sustainability (Switzerland)*, vol. 13, no. 24, pp. 1–18, 2021, doi: 10.3390/su132413560.
- [2] P. Wisutwattanasak, T. Champahom, S. Jomnonkwao, F. Aryuyo, C. Se, and V. Ratanavaraha, "Examining the Impact of Service Quality on Passengers' Intentions to Utilize Rail Transport in the Post-Pandemic Era: An Integrated Approach of SERVQUAL and Health Belief Model," *Behavioral Sciences*, vol. 13, no. 10, 2023, doi: 10.3390/bs13100789.
- [3] R. F. Msacky, "Quality of health service in the local government authorities in Tanzania: a perspective of the healthcare seekers from Dodoma City and Bahi District councils," *BMC Health Serv Res*, vol. 24, no. 1, pp. 1–10, 2024, doi: 10.1186/s12913-023-10381-2.
- [4] P. Wisutwattanasak, T. Champahom, S. Jomnonkwao, F. Aryuyo, C. Se, and V. Ratanavaraha, "Examining the Impact of Service Quality on Passengers' Intentions to Utilize Rail Transport in the Post-Pandemic Era: An Integrated Approach of SERVQUAL and Health Belief Model," *Behavioral Sciences*, vol. 13, no. 10, 2023, doi: 10.3390/bs13100789.
- [5] A. A. Asare, E. Otchi, and A. Manu, "Relevance of meeting general outpatients' information needs to their perceptions of healthcare quality in a hospital in Ghana: a Healthcare Quality Survey using modified SERVQUAL analysis," *BMJ Open Qual*, vol. 13, no. 2, pp. 1–8, 2024, doi: 10.1136/bmjopen-2023-002683.
- [6] H. Hijazi et al., "Assessing the Gap Between Women's Expectations and Perceptions of the Quality of Intrapartum Care in Jordan: A Two-Stage Study Using the SERVQUAL Model," *Health Expectations*, vol. 27, no. 3, pp. 1–15, 2024, doi: 10.1111/hex.14103.
- [7] J. H. Wu, K. T. Lee, K. I. Cheng, J. K. Du, and C. Y. Lee, "Patient perception of service quality to preanesthetic oral examination: a cross-sectional study using the SERVQUAL model," *BMC Oral Health*, vol. 24, no. 1, pp. 1–8, 2024, doi: 10.1186/s12903-024-03853-2.
- [8] R. M. Nishizawa, "Desarrollo del Modelo Servqual para la medición de la calidad del servicio en la empresa de publicidad Ayuda Experto Development of Servqual Model for the measurement of the service quality in the publicity company Ayuda Experto," 2014.
- [9] P. Wisutwattanasak, T. Champahom, S. Jomnonkwao, F. Aryuyo, C. Se, and V. Ratanavaraha, "Examining the Impact of Service Quality on Passengers' Intentions to Utilize Rail Transport in the Post-Pandemic Era: An Integrated Approach of SERVQUAL and Health Belief Model," *Behavioral Sciences*, vol. 13, no. 10, Oct. 2023, doi: 10.3390/bs13100789.
- [10] J. Martilla and J. James, "Importance-Performance Analysis: An easily applied technique for measuring attribute importance and performance can further the development of effective marketing programs," 1977.
- [11] Martilla Jhon A. y James John C., "Importance-Performance Analysis," *J Mark*, vol. 41(1), pp. 77–79, Jan. 1977.
- [12] J. T. Tapia Villalva, C. T. de J. Carbajal Llaue, G. E. Pluas Moran, F. V. Machado Rosado, and N. E. Salcedo Galarza, "Public management model for user satisfaction in health centers," *Universidad Ciencia y Tecnología*, vol. 28, no. Special, pp. 380–390, Aug. 2024, doi: 10.47460/uct.v28ispecial.837.
- [13] V. A. Benites-Zapata, M. Lozada-Urbano, D. Urrunaga-Pastor, E. Márquez-Bobadilla, E. Moncada-Mapelli, and E. Mezones-Holguín, "Associated factors to non-use of formal health services in the Peruvian population: Analysis of the national household survey (Enaho) 2015," *Rev Peru Med Exp Salud Publica*, vol. 34, no. 3, pp. 478–484, Jul. 2017, doi: 10.17843/rpmesp.2017.343.2864.
- [14] Ecos Rosa, "TIEMPO DE ESPERA Y CALIDAD DEL TRIAJE EN LA ATENCIÓN EN EL SERVICIO DE EMERGENCIA INSTITUTO NACIONAL DE CIENCIAS NEUROLÓGICAS 2020," Universidad Particular San Martín de Porres, Lima, 2023.
- [15] H. Dźwigoł and M. Dźwigoł-Barosz, "Scientific Research Methodology in Management Sciences," *Scientific Papers of Silesian University of Technology. Organization and Management Series*, vol. 2018, no. 118, pp. 117–134, 2018, doi: 10.29119/1641-3466.2018.118.8.
- [16] T. Otzen and C. Manterola, "Técnicas de Muestreo sobre una Población a Estudio," *International Journal of Morphology*, vol. 35, no. 1, pp. 227–232, 2017, doi: 10.4067/S0717-95022017000100037.
- [17] Á. G. C. de Gante, W. E. S. González, J. B. Ortega, J. E. Castillo, and A. S. Fernández, "Escala de Likert: Una alternativa para elaborar e interpretar un instrumento de percepción social," *Revista de la Alta Tecnología y Sociedad*, vol. 12, no. 1, pp. 38–45, 2020.
- [18] J. Rodríguez-Rodríguez and M. Reguant-Álvarez, "Calcular la fiabilidad de un cuestionario o escala mediante el SPSS: el coeficiente alfa de Cronbach," *REIRE Revista d Innovaci*

Recerca en Educaci , vol. 13, no. 2, pp. 1–13, 2020, doi: 10.1344/reire2020.13.230048.

- [19] Y. Qiu, C. Xiao, and J. Li, “Service quality evaluation of county-level public hospitals in Chongqing under smart healthcare,” BMC Health Serv Res, 2023, doi: 10.1186/s12913-024-11976-z.
- [20] Y. Qiu, C. Xiao, and J. Li, “Service quality evaluation of county-level public hospitals in Chongqing under smart healthcare,” BMC Health Serv Res, 2023, doi: 10.1186/s12913-024-11976-z.
- [21] V. Denkovski, G. Gavrilov, I. Stojmenovska, and V. Radevski, “Evaluating Physicians’ Satisfaction with Using eHealth System for Managing Patients in Primary and Secondary Care,” EAI Endorsed Trans Pervasive Health Technol, vol. 11, Dec. 2025, doi: 10.4108/eetpht.11.4157.
- [22] S. Weissenfels, A. Nissen, and S. Smolnik, “Advancing digital health in information systems research: Insights from a text mining analysis,” Electronic Markets, vol. 35, no. 1, p. 23, Dec. 2025, doi: 10.1007/s12525-025-00768-w.