VALIDATION OF AN INSTRUMENT FOR PERCEIVED QUALITY OF HEALTH SERVICES IN COLOMBIA

Frank De Hoyos Castro[1]*, Eustorgio Amed Salazar[2], Jhon Jairo Feria Díaz[3]

[1]*,[2]Faculty of Health Sciences, Universidad de Sucre, Sincelejo, 700001, Colombia.
frankdehoyos79@gmail.com; eustorgio.amed@unisucre.edu.co
[3]Faculty of Engineering, Universidad de Sucre, Sincelejo 700001, Colombia.
jhon.feria@unisucre.edu.co

*Corresponding author: Frank De Hoyos Castro
*Email:-frankdehoyos79@gmail.com

Abstract
The quality perceived by health service users is vital for hospital institutions, which is why they require instruments to measure variables such as timeliness, accessibility, and user satisfaction. Most instruments used in Colombia are international scales created for all types of companies and adapted to the health area, which measures quality globally. Consequently, the present study aimed to provide a validated instrument to measure timeliness, accessibility, and satisfaction with health services perceived by users in hospital institutions.
Methods. The study was carried out in phases: design of the instrument, integrative review of the literature using indexed databases and gray literature, organization of the variables, and construction of the items. Qualitative and content validity, through a consensus of experts with four people with extensive experience and studies in the area of management and quality of health services, health auditing and research, who evaluated criteria of sufficiency, clarity, coherence and relevance of the instrument; the consensus was calculated with the V Aiken test. Finally, the reliability was calculated using a pilot test applied to 100 third-level hospital institution users. For internal consistency, Cronbach's Alpha and McDonald's Omega were calculated using SPSS version 27.
Results. An instrument called "Opportunity and accessibility to hospital services" was created with 20 items distributed across three variables. The instrument showed content validity by expert consensus (V Aiken 0.924), specifically opportunity 0.949, accessibility 0.898, and general satisfaction 0.98. Additionally, it showed good internal consistency (Cronbach's alpha 0.855) and McDonald's omega (0.869).
Conclusions. A valid and easy-to-understand instrument that can be used in hospital institutions can contribute to the quality of health services.

Keywords: Quality, Consensus, Instrument, Health Services, Validation.

1. Introduction

Satisfaction is vital within the quality processes of health services and implies the measurement of compliance by institutions with respect to the user's expectations and in relation to the services offered (Huaccho, 2019). Likewise, user perception is fundamental for the improvement of services, and requires the development of strategies according to their needs, considering the balance in the costs of care (Hoyos et al., 2020).

From an organizational perspective, users have different needs and interests that guide them in the interpretation of the services they receive and make them a valuable resource for decision-making in the areas of control (Acevedo, 2015). Therefore, institutions providing health services (IPS) must be able to organize their administrative and care staff to measure the quality of the services provided, considering the perceptions and satisfaction of users (Bedoya et al., 2020).

On the other hand, quality in the provision of health services, measured through the perception of users, is achieved through many indicators, of which timeliness and accessibility are of great importance given that they are aspects of the fundamental principles of health (Ministry of Health and Social Protection, 2013). These indicators reflect the well-being of the user (Pu et al., 2020) as well as the planning, balance, and comprehensive care of health systems (Jiménez et al., 2014), which are affected by social, human, and institutional factors (Mangundu et al., 2020).

Consequently, the IPS within their quality audit processes is responsible for having instruments and indicators to measure these variables, including user satisfaction. However, most instruments for measuring perceived quality in hospital institutions are based on the SERVQUAL and SERVQHOS scales, which are international instruments created for general business environments and adapted to the health area (Henao et al., 2018). They estimated the quality of care globally, contributing little to the accessibility and timeliness of health services. Similarly, in Colombia, there is an instrument designed to estimate the perception of quality in users of elective and emergency services, called PECASSUS, which performs measurements globally (Henao et al., 2018).

Accordingly, an instrument is provided with a validation process to measure timeliness, accessibility, and satisfaction with health services perceived by users in hospital institutions, which contributes to the internal and external audit processes and is useful in the current general social security health system.

2. Methods
2.1 Instrument Development
The methodological process for designing the instrument was developed in four phases (Muñiz, 2018):
- Literature Review and Definition of the Variables.
- Construction of the items
- Qualitative and CONTENT Validity
- Pilot test and reliability calculation

2.2 Review of the literature and definition of the variables
An exploratory review of the scientific literature and grey literature was carried out in databases and through meta-search engines, considering the main variables of the study, in order to then carry out the operational definition of these variables (see Table 1).

2.3 Timeliness of care
Supersalud (2009) defines it as "the possibility for the user to obtain the services he/she requires, without delays that put his/her life or health at risk". There are defined times for assigning appointments for general and specialized medicine as well as transfer times to hospitalization services (Ministry of Health and Social Protection, 2013; Supersalud, 2009).

2.4 Accessibility to health services
This characteristic denotes the intervention of aspects such as coverage of services according to the user's need, elimination of barriers in all social and cultural contexts, and availability without the need for geographical access. (AWHONN, 2017).

2.5 User Satisfaction
Users' perceptions of the fulfillment of their needs and expectations of the services received from the institution (Huaccho, 2019). Satisfied users are loyal to the company and its services and are less likely to explore alternative providers (Acevedo, 2015); therefore, it is necessary to estimate their level of satisfaction with the services received.

Table 1. Operationalization of Variables

Variable	Dimension	Indicator
Opportunity	Waiting time for service	Interval in minutes or hours to receive medical and/or surgical care after the scheduled time.
	Appointment time	Interval in days for an appointment to be assigned for a general practice, specialty practice or surgical procedure after authorization.
Accessibility	Physical accessibility	User's perception of the ease of receiving the required diagnostic and therapeutic means.
	Access to information	Person's perception of the ease and quality of information received.
Satisfaction	Overall satisfaction	Perception of the person in relation to the general satisfaction he/she has with the institution and with the variables used as evaluation criteria.

2.6 Item Construction

The construction of the items of the instrument "Opportunity and accessibility to hospital services" was carried out based on the general characteristics for the design of an instrument (Muñiz, 2018). It was elaborated by considering a socio-demographic information space and the dimensions of the operationalization of variables. Three aspects of the measurement were structured: timeliness, accessibility, and satisfaction.

For timeliness in the provision of services, six items were developed to measure the time the user waits to attend; nine items were developed for accessibility to health services, and four items were designed for general satisfaction with care. Each item had four Likert-type response alternatives.

2.7 Qualitative Validity and Content Validity

An electronic consensus of experts was conducted, which included four people with extensive experience and studies in the area of management and quality of health services, health auditing, and research, who were contacted by e-mail and remained anonymous to avoid biased assessments. The first process in the consensus was qualitative assessment, where each of the judges issued written considerations of form for each of the items, which were adjusted to continue with the validation process.

Next, an expert judgment form was used for the evaluation of content validity (see Table 2), which contained four criteria (sufficiency, clarity, coherence, and relevance) and an evaluation scale of 1–4 points (Escobar & Cuervo, 2008), which were sent to the judges together with the adjusted instrument for its definitive evaluation. With the results of the panel of experts, the content validity was calculated using Aiken's V, which was applied to measure the validity of the general instrument and each of the items, and the statistical measurement was performed with a 95% confidence level, useful in case of applying the instrument in studies with an unknown population (Penfield & Giacobbi, 2004).

Table 2. Evaluation indicators

Category	Qualification	Indicator
Sufficiency	1. Does not meet the criteria	The items are not sufficient to measure the dimension.
	2. Low Level	The items measure some aspect of the dimension, but do not correspond to the total dimension.

	3. Moderate level	Some items should be increased to be able to evaluate the dimension completely.
	4. High level	The items are sufficient.
Clarity	1. Does not meet the criteria	The item is not clear
	2. Low Level	The item requires a lot of modifications or a very large modification in the use of the words according to their meaning or their arrangement.
	3. Moderate level	A very specific modification of some of the terms of the item is required.
	4. High level	The item is clear, has adequate semantics and syntax.
Coherence	1. Does not meet the criteria	The item has no logical relation with the dimension
	2. Low Level	The item has a tangential relationship with the dimension.
	3. Moderate level	The item has a moderate relationship with the dimension it is measuring.
	4. High level	The item is completely related to the dimension it is measuring.
Relevance	1. Does not meet the criteria	The item can be deleted without affecting the measurement of the dimension.
	2. Low Level	The item has some relevance, but another item may be including what this one measures.
	3. Moderate level	The item is relatively important.
	4. High level	The item is very relevant and should be included.

Source: Escobar & Cuervo (2008)

2.8 Pilot Test and Reliability Calculation

For the final evaluation of the instrument, a pilot test was conducted in a third-level clinic in the city of Sincelejo, Sucre, for which written approval was obtained from the general management of the institution. The instrument was applied to 100 users through a digital format guided by a research assistant, who was previously trained in the CONTENT of the instrument, and the operationalization of the variables to which each item responded. The sampling was non-probabilistic by convenience, following the previously established inclusion criteria.

Finally, the reliability of the instrument was verified using Cronbach's Alpha and McDonald's Omega scales (Ventura & Caycho, 2017) using the IBM SPSS version 27 statistical package.

2.9 Ethical considerations

The study was developed in compliance with national and international ethical standards and respecting the bioethical principles of autonomy as well as respect for intellectual property, using informed consent for experts in the consensus and for the users in the pilot test. Likewise, environmental protection was declared, since all the documents in the study were used digitally and electronically.

3. Results

3.1 Content validity

In the detailed consideration of the items by expert judges, there was a consensus on each of the measurement criteria (Table 3). In this sense, the items are sufficient to measure the three variables

(V Aiken 0.92), as well as coherent, clear and relevant (V Aiken 0.83-1.0). It should be noted that in the clarity of items 7-15 that measure accessibility, judge #4 considers them to be at a low level; however, he does not suggest important adjustments, so guided by the criteria of the other judges, it was decided to continue without modifications.

On the other hand, consensus was demonstrated in the instrument for each variable when grouping the items in each measurement criterion (Table 4), obtaining a general content validity of 0.924 using the V Aiken formula; Opportunity, accessibility and general satisfaction were 0.949, 0.898, and 0.98, respectively.

Table 3. Judges' response and content validity by item

Sufficiency	J1	J2	J3	J4	V Aiken	Coherency	J1	J2	J3	J4	V Aiken
Opportunity						**Opportunity**					
Item 1	4	4	4	3	0,92	Item 1	4	4	4	4	1
Item 2	4	4	4	3	0,92	Item 2	4	4	4	2	0,83
Item 3	4	4	4	3	0,92	Item 3	4	4	4	3	0,92
Item 4	4	4	4	3	0,92	Item 4	4	4	4	4	1
Item 5	4	4	4	3	0,92	Item 5	4	4	4	4	1
Item 6	4	4	4	3	0,92	Item 6	4	4	4	4	1
Accessibility						**Accessibility**					
Item 7	4	4	4	3	0,92	Item 7	4	4	4	3	0,92
Item 8	4	4	4	3	0,92	Item 8	4	4	4	3	0,92
Item 9	4	4	4	3	0,92	Item 9	4	4	4	3	0,92
Item 10	4	4	4	3	0,92	Item 10	4	4	4	3	0,92
Item 11	4	4	4	3	0,92	Item 11	4	4	4	3	0,92
Item 12	4	4	4	3	0,92	Item 12	4	4	4	3	0,92
Item 13	4	4	4	3	0,92	Item 13	4	4	4	3	0,92
Item 14	4	4	4	3	0,92	Item 14	4	4	4	3	0,92
Item 15	4	4	4	3	0,92	Item 15	4	4	4	3	0,92
General satisfaction						**General satisfaction**					
Item 16	4	4	4	3	0,92	Item 16	4	4	4	4	1
Item 17	4	4	4	3	0,92	Item 17	4	4	4	4	1
Item 18	4	4	4	3	0,92	Item 18	4	4	4	4	1
Item 19	4	4	4	3	0,92	Item 19	4	4	4	4	1

Relevance	J1	J2	J3	J4	V Aiken	Clarity	J1	J2	J3	J4	V Aiken
Opportunity						**Opportunity**					
Item 1	4	4	4	4	1	Item 1	4	4	4	4	1
Item 2	4	4	4	2	0,83	Item 2	4	4	4	2	0,83
Item 3	4	4	4	3	0,92	Item 3	4	4	4	3	0,92
Item 4	4	4	4	4	1	Item 4	4	4	3	4	0,92
Item 5	4	4	4	4	1	Item 5	4	4	3	4	0,92
Item 6	4	4	4	4	1	Item 6	4	4	3	4	0,92
Accessibility						**Accessibility**					
Item 7	4	4	4	3	0,92	Item 7	4	4	4	2	0,83

Item 8	4	4	4	3	0,92	Item 8	4	4	4	2	0,83
Item 9	4	4	4	3	0,92	Item 9	4	4	4	2	0,83
Item 10	4	4	4	3	0,92	Item 10	4	4	4	2	0,83
Item 11	4	4	4	3	0,92	Item 11	4	4	4	2	0,83
Item 12	4	4	4	3	0,92	Item 12	4	4	4	2	0,83
Item 13	4	4	4	3	0,92	Item 13	4	4	4	2	0,83
Item 14	4	4	4	3	0,92	Item 14	4	4	4	2	0,83
Item 15	4	4	4	3	0,92	Item 15	4	4	4	2	0,83
General satisfaction						**General satisfaction**					
Item 16	4	4	4	4	1	Item 16	4	4	4	3	0,92
Item 17	4	4	4	4	1	Item 17	4	4	4	3	0,92
Item 18	4	4	4	4	1	Item 18	4	4	4	3	0,92
Item 19	4	4	4	4	1	Item 19	4	4	4	3	0,92

Note: J1 - J4 indicates each of the judges who evaluated the instrument and their respective criteria on a scale of 1 - 4.

Table 4. Validity of the instrument's CONTENT (V Aiken)

	Sufficiency	Coherency	Relevance	Clarity	Total
Opportunity	0,92	0,958	0,958	0,958	0,949
Accessibility	0,92	0,92	0,92	0,83	0,898
Satisfaction	0,92	1	1	1	0,98
Instrument	0,92	0,949	0,949	0,877	**0,924**

3.2 Internal consistency

The pilot test was carried out in a third level health institution in the city of Sincelejo, with a sample of 100 people, who met the heterogeneity criteria in terms of age, sex, level of affiliation to the general social security system, socioeconomic stratum and level of education (Table 5). With the sample data, reliability was calculated using the measurement scales described in the methodology. The instrument shows adequate internal consistency, with a Cronbach's Alpha value of 0.855 and McDonald's Omega of 0.869 (see Table 6).

Table 5. Characteristics of the users studied

Socio-demographic variables (n = 100)	Frequency
Age (years old)	
18 – 29	26
30 - 49	41
> 50	33
Gender	
Male	40
Feminine	60
Affiliation	
Contributive	42
Subsidiary	57
Other	1

Socioeconomic Strata	
One	73
Two	24
Three	3
Education Level	
Elementary	36
High School	40
Technical	16
Technologist	4
University	4

Table 6. Reliability of the instrument

Dimensions /Items	α when deleting item	Estimated loads
Opportunity		
Item 1	0,845	0,521
Item 2	0,847	0,471
Item 3	0,856	0,290
Item 4	0,848	0,427
Item 5	0,852	0,318
Item 6	0,857	0,216
Accessibility		
Item 7	0,860	0,194
Item 8	0,850	0,485
Item 9	0,849	0,534
Item 10	0,851	0,484
Item 11	0,853	0,372
Item 12	0,843	0,652
Item 13	0,842	0,677
Item 14	0,847	0,477
Item 15	0,844	0,713
General Satisfaction		
Item 16	0,839	0,810
Item 17	0,843	0,613
Item 18	0,842	0,682
Item 19	0,847	0,605
Instrument reliability	α: 0,855	ω: 0,869

Nota: α = Cronbach's alpha /**ω** = Mcdonald's Omega

4. Discussion

Timeliness and accessibility to health services are fundamental principles regulated by the state (Ministry of Health and Social Protection, 2015), which serve as a reference framework for IPS in monitoring the standards established in the Obligatory System of Quality Assurance in Health (SOGCS), which are of imperative compliance together with other aspects such as humanization of the service, continuity, relevance, and safety (Ministry of Social Protection, 2006). However, many institutions do not provide health services with optimal quality standards because they do not consider the measurement of this and, when studied, reflect low indices in each of the criteria mentioned

(Almeida & Torres, 2020); hence, the relevance of the standardization of an instrument within the reach of these institutions.

On the other hand, it is required to evidence an optimal procedure so that the scientific community can safely use the instrument (De La Hoz Correa, 2014), in this sense, qualitative and CONTENT validity are fundamental in the design and standardization of research instruments in the health area. Aiken's V score of 0.92 in the general instrument, and above 0.83, in each item, reflects the consensus of the expert judges and a motivation for its use, since this scale is widely used in the scientific community not only to summarize the qualifications of experts, but also to test hypotheses in the populations studied, hence the calculation with 95% confidence interval (Dunn et al., 1999). Cited by Penfield and Giacobbi (2004).

The evaluation of reliability is indispensable, above all, to analyze the characteristics of the population in which it was applied and to compare it with the population in which research is planned. The calculation of Cronbach's alpha has become a standard in research instruments, since it estimates the internal consistency of the instrument by calculating the variance of the items (Ventura & Caycho, 2017). However, we calculated the Omega coefficient, which is a good estimate for instruments with small parts. This helps us determine the extent to which the items weigh and are more reliable. (Ventura and Caycho, 2017)

5. Conclusions

The instrument "Timeliness and accessibility to hospital services" is valid, reliable and has a conceptual basis based on Colombian health regulations; in addition, it is clear and easily understood by users of different age groups, socioeconomic strata and educational level, since the characteristics of the sample are considered homogeneous. However, it is recommended to apply it in studies with a larger number of users and with greater variability in socioeconomic strata.

It arises as a need for the scientific community in the health field, especially for hospital institutions that offer outpatient, inpatient, and/or surgical services. It is designed to adjust the quality indicators of the IPS in terms of timeliness, accessibility, and overall user satisfaction with these variables and the care provided.

The variables were measured without establishing an evaluation scale, which allows for comparison with the standards established by the Ministry of Health and Social Protection and with the quality indicators of national and international studies. This provided the researcher with a broader context in which to discuss the results.

References

1. Acevedo Garzón, J. (2015). Evaluation of the service satisfaction of the users of the IPS Servicios Integrales de Salud "VAQNAR" located in the city of Tunja Boyacá. http://repositorio.uptc.edu.co/jspui/handle/001/1457
2. Almeida, A., & Torres, D. (2020). Quality in the Provision of Health Services in a Hospital in Bucaramanga - Colombia. *Espacios*, *41*(49), 234–245. https://doi.org/10.48082/espacios-a20v41n49p19
3. AWHONN. (2017). Access to Health Care Position. *JOGNN*, *46*(1), 114–116. https://doi.org/10.1016/j.jhealeco
4. Bedoya Marrugo, E., Arias Montero, Z., & Viloria Chaparro, E. (2020). *Perception of quality in health services in Colombia, under the SERVQUAL and SERVPERF instruments as of June 2020.* https://jint.usach.cl/sites/jint/files/art._6_articulo_v7n2jint002-20.pdf
5. De La Hoz Correa, A. P. (2014). Proposal for the application of the SERVQUAL scale in the health sector of Medellin. *CES Salud Pública*, *5*(2), 107–116. https://dialnet.unirioja.es/servlet/articulo?codigo=4974882
6. Dunn, J. G. H., Bouffard, M., & Rogers, W. T. (1999). Assessing item content-relevance in sport psychology scale-construction research: Issues and recommendations. *Measurement in Physical Education and Exercise Science*, *3*(1), 15–36. https://doi.org/10.1207/s15327841mpee0301_2

7. Escobar-Pérez, J., & Cuervo-Martínez, Á. (2008). Content validity and expert judgment: an approach to their use. *Avances En Medición*, *6*(1), 27–36.

8. Henao Nieto, D. E., Giraldo Villa, A., & Yepes Delgado, C. E. (2018). Instruments to evaluate the quality perceived by users of health services. *Revista Gerencia y Políticas de Salud*, *17*(34). https://doi.org/10.11144/Javeriana.rgps17-34.iecp

9. Hoyos, A., Tipán, M., & Zemanate, M. (2020). Evaluation of user satisfaction in the outpatient service at the IPS Nuestra Señora de las Misericordias de Bolivar Cauca. In *repositorio ean*. https://repository.ean.edu.co/bitstream/handle/10882/9879/HoyosAnggy2020.pdf?sequence=1& isAllowed=y

10. Huaccho Travezaño, C. (2019). Perception of users regarding the humanized care of the nurse - Emergency - Clínica Padre Luis Tezza - December 2017 - January 2018. *Repositorio Académico USMP*, 1–56. https://bit.ly/3D5mS8G

11. Jiménez Oróstegui, O. L., Flórez Dussán, N., Sanabria Vásquez, L., & Romero Ortiz, J. (2014). Timeliness indicators reported by the Benefit Plan Administration Entities to the National Superintendence of Health (SNS) during 2012-2013. Follow-up of compliance with Decree 019 of 2012. www.supersalud.gov.co

12. Mangundu, M., Roets, L., & Janse Van Rensberg, E. (2020). Accessibility of healthcare in rural Zimbabwe: The perspective of nurses and healthcare users. *African Journal of Primary Health Care & Family Medicine*, *12*(1), 1–7. https://doi.org/10.4102/phcfm

13. Ministerio de la Protección Social. (2006). *Decree number 1011 of 2006*. https://www.minsalud.gov.co/Normatividad_Nuevo/DECRETO%201011%20DE%202006.pdf

14. Ministerio de Salud y Protección Social. (2013). *Resolution 1552 of 2013*. https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDigital/RIDE/DE/DIJ/resolucion-1552-de-2013.pdf

15. Ministerio de Salud y Protección Social. (2015). *Statutory Law No. 1751 of 2015.*. https://www.minsalud.gov.co/Normatividad_Nuevo/Ley%201751%20de%202015.pdf

16. Muñiz, J. (2018). *Introduction to Psychometrics Classical Theory and IRT* (J. I. Luca de Tena, Ed.; Primera edición, Vol. 1).

17. Penfield, R. D., & Giacobbi, P. R. (2004). Applying a score confidence interval to Aiken's item content-relevance index. *Measurement in Physical Education and Exercise Science*, *8*(4), 213–225. https://doi.org/10.1207/s15327841mpee0804_3

18. Pu, Q., Yoo, E. H., Rothstein, D. H., Cairo, S., & Malemo, L. (2020). Improving the spatial accessibility of healthcare in North Kivu, Democratic Republic of Congo. *Applied Geography*, *121*, 2–12. https://doi.org/10.1016/j.apgeog.2020.102262

19. SuperSalud. (2009). *External Circular No. 00056*. https://www.sanidadfuerzasmilitares.mil.co/transparencia-acceso-informacion-publica/4-normatividad/4-6-normograma-digsa/subdireccion-salud-digsa/prestacion-operacion-servicios-salud-1/proceso-garantia-calidad-salud-digsa/normas-externas-aplicadas-al-regimen/circular-056-2009-sed-define-sistema

20. **Ventura León, J. L., & Caycho Rodriguez, T. (2017).** The Omega coefficient: an alternative method for reliability estimation. *Revista Latinoamericana de Ciencias Sociales, Niñez y Juventud*, *15*(1), 625–627. http://www.redalyc.org/articulo.oa?id=77349