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ORIGINAL

Design and validation of a scale to assess user satisfaction with Primary Health Care

Diseño y validación de una escala para evaluar la satisfacción del usuario con la atención en la Atención Primaria

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ABSTRACT

Introduction: Primary Health Care is key to user-centered care but faces challenges such as the lack of valid instruments to measure user satisfaction with the care received.
Objective: to evaluate the psychometric properties of a scale designed to assess user satisfaction with health care.
Method: a methodological study for instrument validation was conducted in Pinar del Río in 2023, focusing on the validation of the SATUS-APS scale. Following its development, the instrument underwent expert validation and a pilot test, including exploratory and confirmatory factor analyses. Content and construct validity, as well as internal consistency, were analyzed.
Results: the SATUS-APS scale showed high item-level content validity (0,85–0,94) and internal consistency (α=0,3). Exploratory factor analysis identified six factors explaining 58,4 % of the variance, with appropriate statistical fit (RMSEA=0,045, CFI=0,976), requiring modifications. The final model included 18 items, showing acceptable fit (CMIN/DF= 2,87, CFI=0,976, TLI=0,940, SRMR=0,0471, RMSEA=0,0404, p<0,001) and excellent overall reliability (α=0,968).
Conclusions: the questionnaire demonstrated validity and reliability for measuring user satisfaction. Its structure was confirmed through factor analysis, and reliability coefficients were high across all dimensions. It is a useful tool for research and quality improvement in health services.

Keywords: Primary Health Care; Health Care Quality, Access, and Evaluation; Health Systems; Personal Satisfaction.

RESUMEN

Introducción: la Atención Primaria es clave para una atención centrada en el usuario, pero enfrenta desafíos como la falta de instrumentos válidos para medir la satisfacción de los mismos ante la atención recibida.
Objetivo: evaluar las características psicométricas de una escala para evaluar la satisfacción de los usuarios con la atención.
Método: estudio metodológico de validación de instrumento, desarrollado en Pinar del Río, en 2023, que consistió en la validación de la escala SATUS-APS. Luego de la elaboración del instrumento, se efectuó la validación por expertos y prueba piloto, con el debido análisis factorial exploratorio y confirmatorio.

Se recurrió al análisis de la validez de contenido y constructo, así como de su consistencia interna.
Resultados: la escala SATUS-APS mostró alta validez de contenido a nivel de ítem (0,85-0,94) y consistencia interna (α=0,83). El análisis factorial exploratorio identificó seis factores que explican el 58,4 % de la varianza, con adecuado ajuste estadístico (RMSEA=0,045, CFI=0,976), precisando modificaciones. El modelo final comprendía 18 ítems, presentando un ajuste aceptable (CMIN/DF=2,87, CFI=0,976, TLI=0,940, SRMR=0,0471, RMSEA=0,0404 y un valor p<0,001), y una excelente confiabilidad global (α=0,968).
Conclusiones: el cuestionario demostró validez y confiabilidad para medir la satisfacción de los usuarios. Su estructura fue confirmada por análisis factorial, y los coeficientes de confiabilidad fueron altos en todas las dimensiones. Se posiciona como herramienta útil para la investigación y mejora de la calidad en los servicios de salud.

Palabras clave: Atención Primaria de Salud; Calidad, Acceso y Evaluación de la Atención de Salud; Sistema de Salud; Satisfacción del Paciente.

INTRODUCTION

Social and economic transformations that have occurred in recent decades have led to significant changes in the population's health status, requiring the adaptation of health policies at a global level. In line with this, a user-centered care model has been promoted, aiming to offer high-quality services. The current trend in the health field is toward humanizing care, seeking to ensure a more satisfactory experience for patients.[1, 2] In this regard, Primary Health Care (PHC) plays a crucial role as the first point of contact between individuals and the health system.[3] Being closer to the community, PHC emerges as the ideal setting to implement user-centered practices, promote equitable access, and comprehensively address the population's health needs.[4]

The social impact of PHC is profound, as it contributes not only to improving individual health but also to reducing social inequalities. By ensuring close, accessible, and culturally appropriate services, PHC strengthens social cohesion, promotes health justice, and protects the most vulnerable groups. Additionally, its community-based approach fosters active population participation in managing their own health, empowering individuals and promoting healthy lifestyles. Thus, PHC not only represents a level of care but also a key strategy to achieve the Sustainable Development Goals related to health and well-being.[5, 6]

At the primary level of care, the vast majority of patients seek prompt resolution of their health problems; therefore, the workload in these units is high and constant. This situation demands that health professionals dedicate limited amounts of time to medical consultations, and that other services such as management, pharmacy, or administration often exceed their processing capacity. However, users attended at this level sometimes perceive that the quality of care and service delivery is negatively affected, causing discomfort and dissatisfaction, which may lead to complaints and legal actions against medical staff.[7]

Since the revolutionary triumph in 1959, the Cuban health system has undergone a process of refinement. However, resource shortages and limitations in professional competence have impacted care within Primary Health Care (PHC), leading to the unnecessary referral of patients to secondary care and increased population dissatisfaction.[8] In this context, user satisfaction, defined by Grandón,[9] as "...the degree of congruence between the user's expectations of ideal health care and their perception of the service received, or as the extent to which health professionals meet the user's needs and expectations," is recognized as a key indicator of care quality.

Despite the growing importance of evaluating healthcare service quality from the user's perspective, few studies in the region focus on validating instruments specifically designed to measure patient satisfaction with strong psychometric backing. Some tools in use lack rigorous validation in terms of reliability and validity, limiting the accuracy of results and their applicability across different contexts.[10, 11] This methodological gap poses a challenge to the continuous improvement of healthcare, as it hampers the collection of consistent and comparable data on user experience at various levels of the health system.

Likewise, other instruments have been used that, while providing useful information on satisfaction, are insufficient on their own, as they focus more on measuring the technical quality of care. These instruments emphasize objective and technical aspects of the service, overlooking subjective perceptions of the care experience. Therefore, using a non-specific tool for each construct may compromise the validity of the results.[12,13,14] In this context, the present study was conducted with the aim of evaluating the psychometric characteristics of a scale to assess user satisfaction with care in PHC.

METHOD

Research Design and Sampling

A methodological instrument validation study was carried out at the Luis Augusto Turcios Lima University

Teaching Polyclinic, located in the municipality of Pinar del Río, between July and October 2023. The development of the SATUS-APS scale included an initial phase comprising a literature review, the formulation of the items to be included, content evaluation by a panel of experts, and a pilot test with 60 users to preliminarily assess internal consistency using Cronbach's alpha coefficient. In a second phase, the instrument was applied to two independent convenience samples of 250 users each. Data from these samples were used to perform an Exploratory Factor Analysis (EFA) and a Confirmatory Factor Analysis (CFA), respectively, to assess the construct validity of the instrument.

Instrument

To develop the scale, a literature review was conducted and several experts in the field were consulted, which allowed the identification and design of the initial version of the instrument. The developed tool included 24 items evaluated using a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Five subject matter experts were consulted to assess the content validity of the questionnaire, focusing on the clarity, relevance, coherence, appropriateness, and wording of the items. The evaluation followed established psychometric methodologies to ensure rigorous analysis. This included the review of the Item-level Content Validity Index (I-CVI) as well as Cronbach's alpha.

Analysis

Before extracting factors, the suitability of the data for this type of analysis was assessed by examining the item correlation matrix, Bartlett's test of sphericity, and the Kaiser-Meyer-Olkin (KMO) index. These indicators confirmed that the data were appropriate for conducting Exploratory Factor Analysis (EFA). To identify the number of factors, the eigenvalue cut-off rule, the "elbow" in the scree plot, and factor significance were used. Additionally, Principal Component Analysis (PCA) and Direct Oblimin rotation (selected because it allows factor intercorrelation) were employed as extraction and rotation methods, respectively. A factor loading threshold of 0,40 was set as the criterion for considering a factor stable and sufficiently representative.

The procedure for Confirmatory Factor Analysis (CFA) was carried out using the maximum likelihood method, assuming oblimin rotation, which is suitable when factor correlations are expected. The data met the assumptions required for this method, including a sufficiently large sample size and multivariate normal distribution of variables. Model fit was assessed using multiple indicators: (a) chi-square to degrees of freedom ratio (CMIN/df), with a recommended value below 5; (b) Goodness-of-Fit Index (GFI) and (c) Comparative Fit Index (CFI), both with desirable values above 0,90; (d) Root Mean Square Error of Approximation (RMSEA), with a threshold below 0,05 indicating good fit; and (e) Standardized Root Mean Square Residual (SRMR), which should be less than 0,08. Factor loadings of 0,70 or higher were also considered adequate, indicating that the items sufficiently explained the variance of the latent factors.

Ethical Considerations

Before beginning the survey, written informed consent was obtained from all participants, in full compliance with the ethical principles outlined in the Declaration of Helsinki. It is worth noting that the questionnaire was designed to preserve the anonymity of respondents by avoiding the collection of personally identifiable information, such as names, social security numbers, or individual health data. The study protocol was approved by the Ethics Committee and the Technical Advisory Board of the Luis Augusto Turcios Lima University Teaching Polyclinic, both of which verified compliance with ethical standards and guidelines throughout the research process.

RESULTS

The results showed that the Item-level Content Validity Index (I-CVI) ranged from 0,85 to 0,94, indicating a high degree of content validity for individual items. The Cronbach's alpha coefficient for the tool, composed of 24 questions, was 0,83 (95 % confidence interval: 0,81–0,86), demonstrating high internal consistency.

When examining the inter-item correlation matrix, the Spearman correlation coefficients among items were all above 0,30, suggesting an appropriate structure of relationships. Bartlett's test of sphericity was significant ($p<0,01$), and the Kaiser-Meyer-Olkin (KMO) measure yielded a value of 0,81, which is interpreted as very good sampling adequacy. Both results confirm that the data were suitable for conducting an Exploratory Factor Analysis (EFA).

Exploratory Factor Analysis

The structure was accepted as comprising six factors, with eigenvalues ranging from 1,0028 to 3,2984. Additionally, the "elbow" in the scree plot appeared at Factor 6, as shown in figure 1, supporting the significance of these factors.

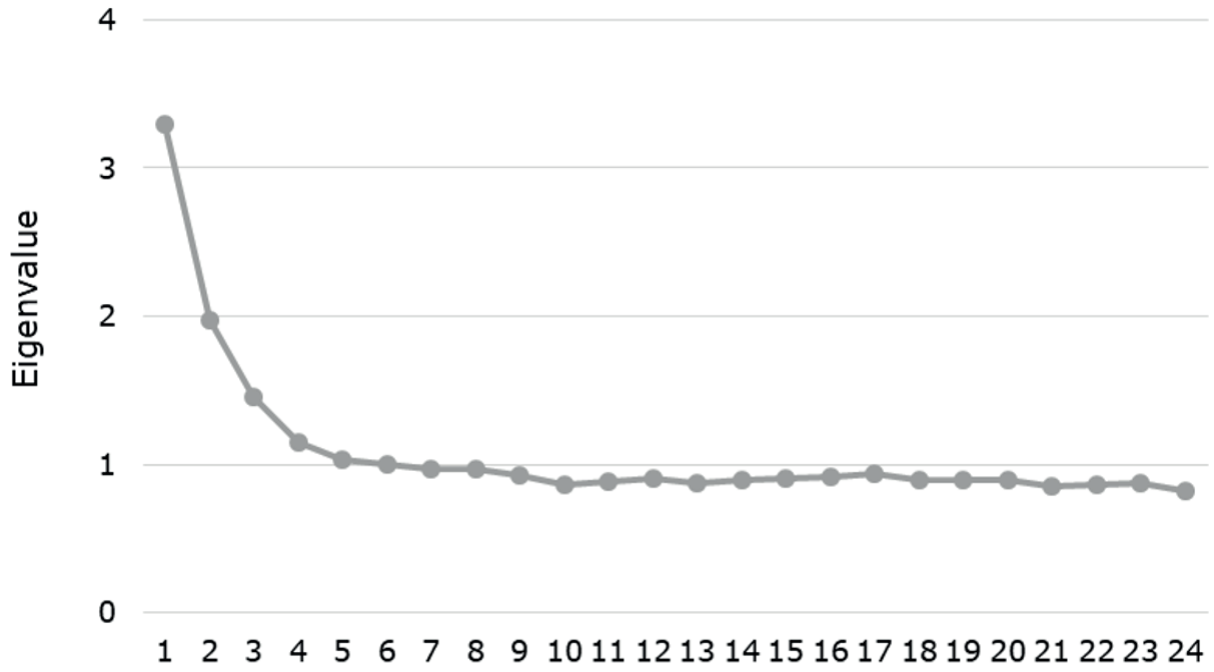


Figure 1. Scree plot of eigenvalue after factor

The scale items were subjected to Exploratory Factor Analysis (EFA) using the maximum likelihood extraction method and oblimin rotation, which allowed for factor correlation. The six-factor model showed a good fit according to the criteria detailed in the data analysis section. It met the statistical criteria for a good model fit: $x^2(276) = 2124$, $p<0,001$; RMSEA=0,045, 90 % CI=0,033–0,057, CFit=0,87; TLI=0,920 ($p<0,001$). Table 1 presents the factor loadings and uniqueness values for the items that comprise the scale. The analysis led to the removal of items 1, 4, 8, 11, 15, and 24.

Table 1. Distribution of items according to factor loadings and uniqueness

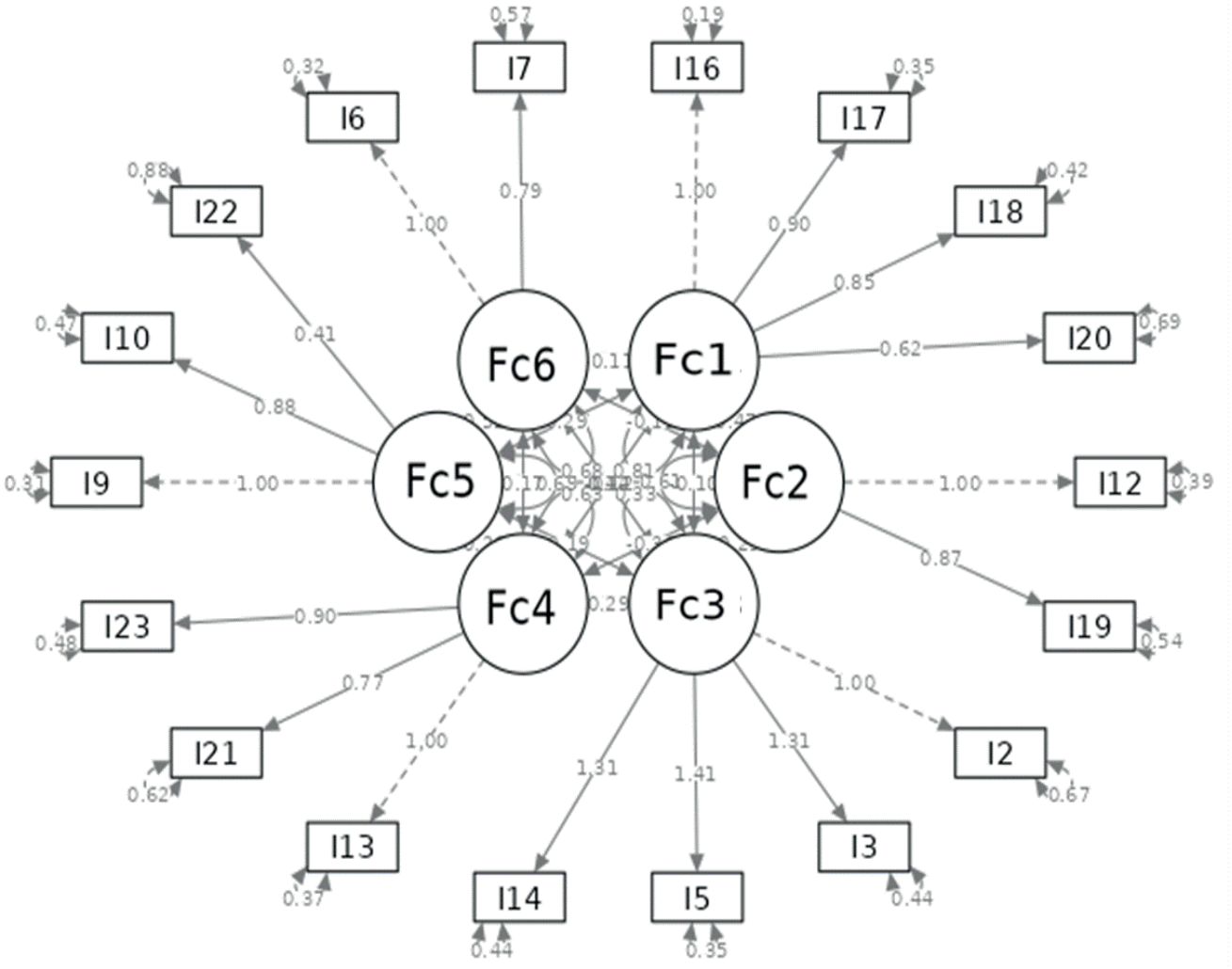
Ítem	Factor						Uniqueness
	1	2	3	4	5	6	
1			-0,512				0,705
2			0,649				0,510
3			0,736				0,384
4			0,420				0,667
5			0,549				0,509
6						0,540	0,486
7						0,719	0,428
8						0,407	0,759
9					0,873		0,158
10					0,398		0,555
11		0,549					0,659
12		0,655					0,363
13		-0,381		0,469			0,484
14		-0,585	0,375				0,409
15		-0,380					0,557
16	0,813						0,295
17	0,817						0,351
18	0,752						0,428
19	0,437	0,485					0,458
20	0,382						0,346
21				0,587			0,337
22				-0,435	0,318		0,463
23				0,782			0,345
24		0,302					0,741

This structure accounts for 58,4 % of the accumulated variance, and the six identified factors align with the theoretical references reviewed, which comprehensively address the evaluated construct. Based on this review, six key areas were identified that consistently reflect the patient experience, selected for their conceptual and practical relevance and their ability to capture the complexity of the phenomenon. These dimensions consistently reflect the core components of the patient experience, resulting in the following instrument structure:

- Factor 1 (Communication): items 16, 17, 18, and 20
- Factor 2 (Physical environment conditions): items 12 and 19
- Factor 3 (Perceived technical competence): items 2, 3, 5, and 14
- Factor 4 (Care coordination): items 13, 21, and 23
- Factor 5 (User empowerment and participation): items 9, 10, and 22
- Factor 6 (Time dedicated): items 6 and 7

Confirmatory Factor Analysis

Figure 2 illustrates the path diagram of the modified model, showing the evaluated constructs and their respective items. The multifactorial model was developed based on the results of the exploratory factor analysis. The six-factor model demonstrated an acceptable fit, with CMIN/DF=20,87, CFI=0,976, TLI=0,940, SRMR=0,0471, RMSEA=0,0404, and a p<0,0010, table 2 displays the evaluated model, including the analysis of the factor loadings for each item and the respective standard errors of their estimates.



Note: Fc1 (Communication); Fc2 (Physical environment conditions); Fc3 (Perceived technical competence); Fc4 (Care coordination); Fc5 (User empowerment and participation); Fc6 (Time devoted)

Figure 2. Standardized structural model of six factors of the SATUS-APS scale

Table 2. Fit indices for each item on the model

Factor	Indicator	Estimator	SE	Z	p value
Fc1	I16	0,405	0,0661	21,24	<0,001
	I17	0,754	0,0654	19,17	<0,001
	I18	0,834	0,0710	15,97	<0,001
	I20	0,798	0,0802	9,95	<0,001
Fc2	I12	0,653	0,0918	13,65	<0,001
	I19	0,742	0,0874	11,92	<0,001
Fc3	I2	0,683	0,0591	11,54	<0,001
	I3	0,972	0,0614	15,82	<0,001
	I5	0,992	0,0587	16,89	<0,001
	I14	0,949	0,0717	13,24	<0,001
Fc4	I13	0,786	0,0724	14,99	<0,001
	I21	0,653	0,0578	11,30	<0,001
	I23	0,840	0,0601	13,99	<0,001
Fc5	I9	0,826	0,0638	17,64	<0,001
	I10	0,733	0,0759	14,92	<0,001
	I22	0,426	0,0828	5,14	<0,001
Fc6	I6	0,933	0,0664	14,04	<0,001
	I7	0,810	0,0686	11,81	<0,001

Notes: SE (Standard Error); Fc1 (Communication); Fc2 (Physical environment conditions); Fc3 (Perceived technical competence); Fc4 (Care coordination); Fc5 (User empowerment and participation); Fc6 (Time devoted).

Internal consistency reliability

The instrument showed a Cronbach's alpha value of .968. The construct reliability was as follows: Communication =0,938; Physical environment conditions =0,749; Perceived technical competence =0,801; Care coordination =0,836; User empowerment and participation =0,921; and Time devoted =0,789. Item-total correlations showed strong and statistically significant values, ranging from 0,330 to 0,796, suggesting that all items belong to the scale. The final structure of the instrument is represented in annex 1.

DISCUSSION

Over time, multiple approaches have been proposed to address this need, ranging from expert panels and general institutional evaluation frameworks to more specific instruments tailored to particular care contexts, including those developed in Latin America. While some studies have demonstrated strong biostatistical support,[15,16,17] others present tools that, although they address relevant dimensions such as accessibility and quality of care, lack rigorous psychometric validation to ensure their validity and reliability. This limitation restricts the widespread application of such tools and questions their ability to accurately and consistently measure user satisfaction in Primary Care settings.[18,19] Therefore, it is essential to design, adapt, and validate instruments that not only meet the theoretical and operational requirements of the healthcare sector but also possess a solid methodological foundation to ensure the quality of the data collected and its utility for effective decision-making.

Instrument validation through psychometric testing is a crucial process for ensuring the accuracy and quality of data collected in social, educational, and health research. This process helps confirm that the instrument effectively measures what it intends to measure, thus ensuring construct validity. By applying psychometric analyses, such as content validity and construct validity, researchers can assess whether the items in the questionnaire are well-formulated, relevant, and consistent with the study's objectives.[20,21]

Furthermore, the use of psychometric tests like exploratory and confirmatory factor analysis allows for the examination of the instrument's internal structure. These statistical procedures identify the logical grouping of items into dimensions or factors, which is fundamental for establishing the conceptual coherence of the instrument. In addition, internal consistency, commonly measured by Cronbach's alpha coefficient, provides information on the reliability of the responses, ensuring that the items produce stable and homogeneous results.[22]

The findings obtained relate to those reported by Vázquez-Cruz et al.,[7] who emphasize the importance of considering multiple dimensions in patient satisfaction evaluation, such as technical quality, staff attention,

and organizational efficiency. They point out that, when validating a new instrument, it is critical for it to capture these dimensions in order to adequately reflect the patient experience in primary healthcare (APS). Additionally, they highlight the need for the tool to be adapted to the local context, stressing the importance of using valid, reliable, and culturally relevant instruments.

The study by Chang de la Rosa et al.,[8] unlike the present study, shows significant methodological limitations in the use of the applied questionnaire. A formal validation process of the instrument is not reported, nor is there any data on its internal consistency, structure, or theoretical foundation. Furthermore, the article omits key information on the number of items, scales used, inclusion criteria, and sampling method, making it difficult to evaluate the rigor and generalizability of the results. These deficiencies not only hinder replication in future research but also limit the reliability of the applied instrument, highlighting the need for using validated, methodologically robust tools.

In the study by Castelo Rivas et al.,[23] the instrument developed presents limitations in terms of scientific rigor, as its validation has been based solely on expert judgment, without the inclusion of complementary validation methods such as empirical validation or more exhaustive statistical analyses. This approach could affect the robustness of the results and its applicability in broader contexts. Additionally, the exclusive use of Kendall's bivariate correlation for statistical analysis presents several restrictions, as it only measures the strength and direction of the association between two variables, without exploring aspects such as causality, mediation, or moderation. The lack of complementary analyses, such as regressions or factor analyses, limits the understanding of the underlying data structure and the validity of the observed relationships. The failure to justify the lack of additional statistical techniques, such as multivariate analysis, weakens the interpretation of the results and compromises the external validity and generalizability of the conclusions.

The study by González Fiallo et al.,[10] similarly presents methodological limitations, particularly regarding the instrument used to measure patient satisfaction. The adaptation of the Sánchez Barrón questionnaire,[19] whose formal validation is not detailed, compromises its scientific rigor. Furthermore, the statistical analysis is limited to basic techniques, without employing multivariate methods that could provide deeper insights into the findings. It is also not specified whether the questionnaire covers all key dimensions of satisfaction or whether it was adapted to the Cuban cultural context, which is critical to ensuring the relevance and validity of the responses obtained. These methodological gaps reduce the strength of the conclusions and the possibility of generalizing the results.

Psychometric validation not only strengthens the methodological rigor of the study but also contributes to evidence-based decision-making. Validated instruments allow for more accurate diagnoses, greater confidence in evaluating interventions, and comparisons of results across different contexts. In the field of healthcare, for example, having reliable and valid scales to measure user satisfaction is key to identifying areas for improvement, promoting service quality, and strengthening the patient-centered approach.[24]

The results must be interpreted in light of the study's limitations. First, an intentional sampling method was used, meaning that participants were selected according to predefined criteria rather than randomly. This may affect the representativeness of the sample and limit the generalizability of the findings to the broader population. Additionally, the participation rate was less than 10 %, as the sample size was determined based on the number of items in the instrument. This low participation could introduce bias if individuals who did not respond have different characteristics or perceptions from those who did, which is why replication of the study on a larger scale is recommended.

CONCLUSIONS

The results obtained in this study show that the SATUS-APS questionnaire has solid psychometric support in terms of validity and reliability for evaluating user satisfaction in the context of Primary Healthcare nationwide. Regarding its internal structure, factor analysis confirmed an adequate model configuration, showing robust fit indices and excellent reliability coefficients in each of the dimensions evaluated. These findings allow the SATUS-APS to be proposed not only as a valid tool for research purposes but also as a standardized instrument of practical use in the management, monitoring, and improvement of healthcare systems and services in Cuba. Its systematic application could contribute to informed decision-making, the design of user-centered interventions, and the strengthening of public health policies aimed at improving the patient care experience.

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FINANCING

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ANNEX

Annex 1. SATUS-APS Scale

This instrument has been developed to assess user satisfaction with healthcare. To complete it, mark with an X the option that best reflects your opinion on the care received, based on the following scores:
1 = Strongly disagree
2 = Disagree
3 = Neither agree nor disagree
4 = Agree
5 = Strongly agree

Domains	Item	Question	Respuesta				
			1	2	3	4	5
Time dedicated	1	The healthcare professional dedicated the necessary time to me during the consultation.					
	2	I did not feel that the healthcare staff rushed my care.					
Conditions of the physical environment	3	The health center facilities were clean and orderly.					
	4	I felt comfortable and safe in the physical environment during the care.					
Care coordination Perceived technical competencies	5	I was clearly explained how to follow the treatment after the consultation.					
	6	The referral process to other levels of care was quick and appropriate.					
	7	I received timely follow-up after a previous medical referral.					
Communication	8	I trust that the healthcare staff has the necessary knowledge to treat me.					
	9	The medical decisions made were clear and justified.					
	10	The professional explained the medical procedures with confidence and clarity.					
	11	I was provided with accurate information about my health condition.					
Domains Time dedicated	12	The healthcare staff listened to me attentively.					
	13	I felt comfortable expressing my doubts or concerns.					
	14	The information I received was clear and easy to understand.					
	15	I felt that my opinions about my treatment were taken into account.					
Conditions of the physical environment	16	I was informed about my rights as a patient.					
	17	I was able to actively participate in decisions about my treatment.					
	18	I was offered recommendations to maintain and improve my health.					

Level of satisfaction:
Very dissatisfied (18-35 points)
Dissatisfied (36-53 points)
Satisfied (54-71 points)
Very satisfied (72-90 points)

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