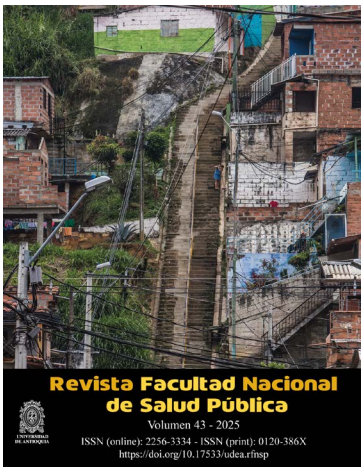

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Development of an instrument for the measurement of patients' perception of care integration within the cardio-cerebrovascular services pathway*

Sandra Marcela Camacho-Rojas[1], Diana Margarita Pinto-Masis[2], Steffany Lorena Villate-Soto[3], Ricardo Sánchez-Pedraza[4], María José Hoyos-Bedoya[5],

1 Master's Degree in Public Health. Universidad Nacional de Colombia. Colombia. sandramcamachor@gmail.com

2 Doctor of Science in Population and International Health. Universidad Nacional de Colombia. Colombia. dmpinto@gmail.com

3 Master in Clinical Epidemiology. Universidad Nacional de Colombia. Colombia. svillates@unal.edu.co

4 Master in Clinical Epidemiology. Instituto de Investigaciones Clínicas, Facultad de Medicina. Universidad Nacional de Colombia. Colombia. rsanchezpe@unal.edu.co

5 Master's Student in Clinical Epidemiology. Universidad Nacional de Colombia. Colombia. mjhoyosb@unal.edu.co

Abstract

Objective: To develop an instrument to measure patient perceptions about integrated care in the cardio-cerebrovascular care pathway.
Methods: An instrument was designed after carrying out a systematic search and a free search in the literature to identify scales and surveys measuring patient perceptions about integrated health care. We selected items evaluating the construct of integration, applicable to the Colombian context and useful for quality improvement actions; and subsequently, an instrument was developed. An expert panel assessed the first version to analyze the validity of its contents. Some adjustments were made and a pilot test was carried out with 14 patients in order to assess the clarity and suitability of the items.
Results: The initial instrument included 18 items from 7 surveys and 10 new items developed by the researchers. The experts confirmed the validity of the instrument and suggested adjustments to the wording and response options to adapt it to the local context. The pilot test led to minor changes in the explanations and wording in response options. The final instrument included 28 Likert-type items.
Conclusion: An instrument was developed according to the international literature and adapted to the local context in order to measure patient perception about integrated care in the cardio-cerebrovascular care pathway.

--------*Keywords*: patient-directed care, continuity of patient care, integrated health care delivery, cardio-cerebrovascular care pathway, instrument validation and testing

* This study is part of the research project Fragmentation of Care for Hypertension and Type II Diabetes *Mellitus*: A Longitudinal Analysis from the Patients' Perspective in Bogotá, which was approved by the Ethics Committee of Universidad Nacional de Colombia on August 10, 2023, code V.FM.1.002-CE-139-23, and the Ethics Committee of Imperial College London. It is still ongoing.

Desarrollo de un instrumento para medir la percepción de los pacientes sobre la integración en la atención de la ruta cardio cerebrovascular

Resumen

Objetivo: Desarrollar un instrumento para medir la percepción de los pacientes sobre la integración en la atención de la ruta cardio cerebrovascular.
Métodos: Se diseñó un instrumento a partir de una búsqueda sistemática y una búsqueda libre en la literatura para identificar escalas y encuestas que miden la percepción de los pacientes sobre la integración en el cuidado en salud. Se seleccionaron ítems que evaluaran el constructo de integración, aplicables para el contexto colombiano y útiles para acciones de mejora de la calidad, y posteriormente, se desarrolló un instrumento. Un panel de expertos evaluó la primera versión para analizar la validez de contenido. Se efectuaron ajustes y al final se hizo una prueba piloto con 14 pacientes para evaluar la claridad y la idoneidad de los ítems.
Resultados: El instrumento inicial incluyó 18 ítems de 7 encuestas y 10 nuevos ítems desarrollados por los investigadores. Los expertos confirmaron la validez del instrumento y sugirieron ajustes en redacción y en opciones de respuesta para adecuar al contexto local. La prueba piloto llevó a cambios menores de redacción y aclaraciones en opciones de respuesta. El instrumento final incluyó 28 ítems tipo Likert.
Conclusión: Se desarrolló un instrumento para medir la percepción que los pacientes tienen de la integración en la ruta cardiocerebrovascular a partir de la literatura internacional y adaptado al contexto local.

---------*Palabras clave*: atención dirigida al paciente, continuidad de la atención al paciente, prestación integrada de atención de salud, ruta cardio cerebrovascular, validación de instrumentos y pruebas

Desenvolvimento de um instrumento para a medição da percepção dos pacientes sobre a integração da atenção da rota cardio cerebro vascular

Resumo

Objetivo: desenvolver um instrumento para medir a integração dos cuidados da rota cardio-cerebrovascular na perspectiva dos pacientes.
Métodos: Escalas que medem a percepção dos pacientes sobre a integração em saúde foram identificadas por meio de uma busca sistemática na literatura e uma busca livre da literatura. Foram selecionados itens que avaliavam o construto integração, aplicados ao contexto colombiano e que continham ações de melhoria da qualidade da atenção e um instrumento foi desenvolvido. Um painel de especialistas avaliou a primeira versão do instrumento para avaliar a validade de conteúdo. Foram feitos ajustes e posteriormente um teste piloto com quatorze pacientes para avaliar a clareza e relevância dos itens.
Resultados: O instrumento inicial incluiu 18 itens de 7 escalas e 10 novos itens desenvolvidos pelos pesquisadores. Os especialistas confirmaram a validade do instrumento e sugeriram ajustes na redação e nas opções de resposta para melhor representar o contexto local. O teste piloto levou a pequenas alterações no instrumento e esclarecimentos sobre algumas opções de resposta. O instrumento final incluiu 28 itens do tipo Likert.
Conclusão: Foi desenvolvido um instrumento para medir a percepção dos pacientes sobre a integração na via cardiocerebrovascular baseado na literatura internacional e adaptado ao contexto local.

----------*Palavras-chave*: assistência centrada no paciente, prestação integrada de cuidados de saúde, continuidade da assistência ao paciente; rota cardio-cerebrovascular, estudo de validação

Introduction

Cardiovascular care requires an integrated service approach to achieve better control of patients' conditions at a sustainable cost for health systems [1]. This approach is crucial in pathologies such as coronary heart disease, cerebrovascular events, and diabetes, which have remained three of the top ten leading causes of disease burden in 2021 [2]. In the same year, in Colombia, 22% of mortality was attributed to circulatory system-related causes [3].

Fragmentation in healthcare delivery can be defined as the opposite of both *continuity* in medical care [4] and *integration* of health services [5]. More broadly, fragmentation refers to the lack of coordination among the functions or agents involved in medical care, which impacts health outcomes since these require coordinated and continuous service delivery.

In this study, we adopt Singer *et al.'s* definition of *integrated care*, which consists of "patient care coordinated among professionals, facilities, and support systems; continuous over time and between visits; adapted to the needs and preferences of patients; and based on shared responsibility between the patient and caregivers to optimize health" [6]. The integration construct proposed by Singer includes four domains [6]: a) continuity of the patient-care team relationship over time and between visits; b) coordination among professionals, facilities, and support systems; c) patient-centered care, in which care is designed to meet the patient's needs and preferences; and d) access to services and medications included in the patient's management plan.

Fragmentation in healthcare services can generate inefficiencies related to service duplication, higher administrative costs, lack of continuity, and deficiencies in care quality [7], which in turn can hinder good health outcomes [8].

Since 2016, the Colombian health system has had a Comprehensive Health Care Policy [9] and an integrated care model aimed at addressing the fragmentation of health services. This policy defines several strategies, including the implementation of *Integrated Health Care Pathways* (RIAS) [10]. Bogotá, the country's capital, on the other hand, adopts the cardiovascular and cerebrovascular and metabolic integrated care pathway (RIA-CCV), aimed at the population at risk of or with cardiovascular or metabolic disorders, including hypertension (HT) and type 2 diabetes *mellitus* (T2DM) [10].

The proper functioning of the RIA-CCV is key to addressing the disease burden caused by non-communicable diseases [11]. In spite of this, in 2020, a study that documented care experiences along the RIA-CCV from 30 adults diagnosed with HT and T2DM in Bogotá suggested the existence of care fragmentation along the pathway [12]. Also, for the period 2021-2023, there was national evidence of gaps in the control of T2DM and HT, and in body mass index [13, 14]. Besides, a series of other problems, such as limitations in access to medications and medical services not part of the provider network, difficulties in scheduling appointments, and delays in specialist appointments were identified [15]. This evidence warrants investigation into which factors within the implemented RIA-CCV in Bogotá might be affecting the effectiveness of this model.

Currently, available measures in Colombia regarding the outcomes of service delivery models focus on mortality; incidence; prevalence of disease; and risk management indicators, which have been based on data reported by both providers and insurers (health service providers). Data on care quality is typically cross-sectional, retrospective, and administrative, and does not include patient experience. When patient experience data are collected, recall bias is often not controlled for. Besides, the data do not allow for evaluations of care integration to diagnose potential flaws in the healthcare system [12]. Furthermore, there is no operational definition of integrated care or indicators to measure it, nor do we know whether patients experience integrated/unfragmented care that meets their needs.

Thus, there is a lack of an essential component to understand the healthcare landscape and the performance of the Colombian healthcare system. There is also a need for a definition of *integrated care* data to measure care integration in the RIA-CCV and to involve patients' experiences in this evaluation.

Considering that other instruments available in the literature [6,16,17] do not fit the particularities of the Colombian context and that the use of an instrument to assess care integration requires the inclusion of local healthcare characteristics, we proposed the development of a new instrument to measure integration in care from the patient's perspective. Such instrument would adapt integration constructs available in international literature. This article presents the steps taken for the development of this instrument and the lessons learned at each stage of its construction.

Methods

A health measurement scale development study was conducted, for which we proposed four stages, following the methodology used in other validations [18]: a) literature search, b) selection and adaptation of questions, c) content validation with experts, and d) pilot test with patients.

Contextual questions were incorporated into the instrument to characterize the patient, their risk, health condition, and patterns of service utilization. This strategy

of nesting within another structure not correlated with the construct that is being assessed is used to reduce potential biases and improve the separation of underlying factors [19].

The new instrument would be applicable to patients with HT and T2DM who are users of a care and follow-up pathway for their chronic condition. Its purpose would be to assess these patients' perception of the integration of services they receive in their care network.

The literature search aimed to identify surveys and scales (SS) that evaluated the integration construct and the domains proposed by Singer from the patient's perspective. To achieve this, two parallel methods were employed: a structured search for systematic reviews (SR) and a free search for SS in Spanish, used in the Latin American or Colombian context, or reference surveys at the national and global levels.

The systematic literature search was conducted on December 2, 2023, in Medline through PubMed. In it, the following terms were used: "continuity of care," "integration of healthcare," "patient-centered care," "fragmentation," "coordination in healthcare," and "surveys and questionnaires." Then, the SR filter from PubMed was used to select studies that used SS to measure integration or fragmentation in healthcare (see Appendix 1). Next, SRs published after 2010 were included, duplicate articles were removed, and titles and abstracts were screened according to the following inclusion criteria: the SS should assess the experience of patients with chronic diseases (particularly HT and T2DM) in healthcare integration. After that, a full reading of the articles was conducted to determine whether they met these criteria.

From the chosen articles, the SS to be evaluated were extracted. Duplicates of these SS were removed, and a screening was conducted according to the target population and inclusion criteria. SS published before 2010 were also excluded, selecting this year as the cutoff to avoid outdated scales for measuring current healthcare systems. Finally, a search for the original publication of the selected SS from the systematic review was conducted, and a selection of the SS was implemented based on the article's title, abstract, and target population and the previously mentioned criteria (see Figure 1).

To write the questions from the selected SS, a discussion was held among three of the researchers to choose those that could be considered most appropriate for the country context and the context of the RIA-CCV; those that could generate actions for improvement; and those that reflected the patients' experience, classifying them into the established domains. When the questions from the SS did not measure any aspect of the domains, researchers created or adapted them. Subsequently, an initial proposal of the scale for measuring the items was made in a Likert-type format. This type of format captures the measurement of each item on an ordinal scale,

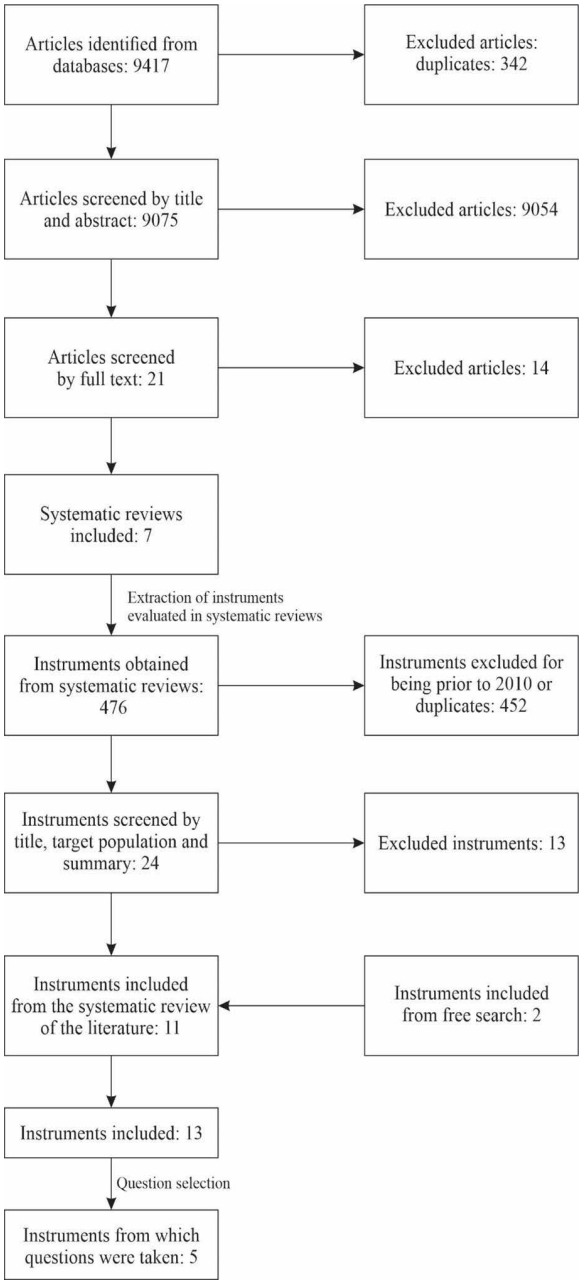

Figure 1. Diagram of the results of the search

allowing the use of different measurement formats, such as frequency, extent, similarity, and agreement [20].

To determine the content validity of the instrument, an expert evaluation was conducted following the guidelines of Boateng. Experts were asked to evaluate the relevance of the item content, their representativeness within the theoretical domains, and the technical quality of each one [21]. The experts were professionals with knowledge of both the Colombian healthcare system and chronic patient care processes who had participated

in the development of risk management indicators for the care pathway or had accumulated clinical expertise in chronic pathologies related to care pathways.

These experts were first invited to a meeting where the project was presented, including its theoretical framework, the proposed domain structure, the instrument, and the methodology to reach consensus, which was approved by the attendees. Participants voted individually on whether each question in the instrument met the criteria for belonging to the integration construct and to the proposed domain, or if it needed to be reformulated.

Then, in a consensus meeting, proposed modifications were discussed for those questions that had gotten 80% or lower approval rate by participants or had a "reformulate" recommendation from experts. The discussion was recorded in video and audio formats with the consent of the attendees. Once this was done, recommendations were extracted and modifications were made to the instrument, which were subsequently discussed with the entire research team.

For the pilot test, 14 patients from a healthcare provider institution (IPS) in Bogotá were invited. This institution was selected because it had an established cardio cerebrovascular pathway for the follow-up of patients with HT and T2DM and was operational. Additionally, the institution showed interest in participating in the study and offered logistical support. In this institution, around 9,000 patients are enrolled in the RIA-CCV, and most are affiliated with the contributory regime.

The objectives of the pilot test were to determine if there were difficulties in answering the instrument and ensuring that the questions were formulated clearly and precisely. The selection criteria for participants were the following: patients diagnosed with HT or T2DM, over 30 years old, and under follow-up in the IPS's chronic program. Pregnant women, patients with cognitive impairment, and individuals with hearing disabilities or communication difficulties were excluded from the preliminary test. The sampling method used was non-probabilistic convenience sampling, which consisted in choosing those who first agreed to participate in the study.

Each patient signed an informed consent form before participating. The interviewer, a medical professional with experience in chronic patient care, read each question and the response options to the participant, documenting the time it took each participant to answer the instrument, the difficulties observed and those expressed by the patient.

Once the instrument was applied, each patient was asked if any of the questions seemed difficult to answer, confusing, offensive, or difficult to understand. Additionally, participants were asked to rephrase the question in their own words if they answered affirmatively. This was done using the methodology of the European Organisation for Research and Treatment of Cancer [22]. Based on the pilot results, the instrument was modified to improve its comprehension by the patients.

The instrument development process took place within the context of the research project Fragmentation of Care for Hypertension and Type 2 Diabetes *Mellitus*: Longitudinal analysis from the patients' perspective in Bogotá. To measure care fragmentation, the initial stage consisted of designing an instrument adjusted to the Colombian sociocultural particularities and healthcare system. The second stage involved the validation of the instrument. This article reports on the results of the initial stage.

The study is considered a minimal risk study according to Resolution 8430 of 1993 of the Colombian Ministry of Health [23] and complies with the ethical guidelines for research involving human subjects of the Helsinki Declaration [24].

Results

From the literature search, 21 SRs were obtained, of which only 7 met the inclusion criteria [25-31]. These identified 476 SS, which were screened according to their target population, year of publication, and the inclusion criteria previously defined. Ten SS were obtained [6,16,32-40], with three additional ones identified in the free search [17,41,42].

The selection and adaptation of questions were based on 13 selected SS, which contained a total of 335 questions. Many of the questions from different SS were similar. As shown in Table 1, 38 questions were selected from 5 SS, 18 questions were part of the instrument, and 20 additional questions were included either to give a sequence to the instrument's questions or to identify an objective anchor for making improvement recommendations. Some questions had to be adapted or supplemented to fit the context of the RIA-CCV and its implementation, leading the researchers to propose 20 additional questions. At the end, the questionnaire had 58 questions: four from the access , five from the continuity, and 11 from the coordination domains. Additionally, it included eight questions from the patient-centered care domain, and 30 questions related to general aspects.

Ten out of the 15 experts invited participated in the validation, nine in person and one virtually, from the following disciplines: general medicine, internal medicine, geriatrics, nursing, dentistry, and health occupational management. Some experts also had sub-specialties in public health, biostatistics, and epidemiology.

In the expert voting, all questions reached approval of 80% or more regarding their relevance to the construct. Regarding domain relevance, two questions received less than 80%: a) "Does the reminder help you not to miss your appointments?", from the continuity of care

Table 1. Surveys and Scales Used as the Basis for the Construction of the Instrument and Selected Questions by Domain

Survey or Scale [Source] – Type of Search	Geographic Scope	Objective	Domain and Selected Question Adapted for the Instrument
Continuity of Care Questionnaire between Levels of Care (CCAENA) [16] – Systematic search	Spain; has a validated version for Colombia and Brazil	Measure continuity among care levels from the user's perspective	Continuity: When you make an appointment with general medicine, are you seen by the same doctor? Access: How do you find the waiting time?
Patient Perceptions of Integrated Care (PPIC) [6] — Systematic search	United States	Measure integrated care from the patient's perspective	Coordination: How often does the general practitioner seem to be informed and updated about the care you have received from specialists that you have visited? How often does this provider seem to know important information about your medical history? Do you consider that at some point the doctor has been unaware of important information about your health because it had not been written on your medical records? Patient-Centered Care: In the last 6 months, has this provider talked to you about setting health goals? In the last 6 months, how often has this provider or someone from their office talked to you about how to take your medication? Continuity: When you miss an appointment or do not pick up medications prescribed by the doctor, how often does someone from the office contact you to reschedule the service?
Patients' Assessment of Chronic Illness Care (PACIC) [36] — Systematic search	Netherlands	Evaluate the patient's perspective on the functioning of a chronic care model	Coordination: I believe that the health care received for managing my hypertension or diabetes has been properly organized.
Quality of Life Survey (ECV) [42] — Free search	Colombia	Obtain information about different aspects and dimensions of household well-being, including access to goods and services, health, education, and care for children under 5 years old,. It is a national reference for access barriers	Access: When you need an appointment, an exam, or medication for your hypertension and diabetes, how easy is it to access the service?
Patient-Reported Indicator Surveys (PaRIS) [17] — Free search	International collaboration — Organization for Economic Cooperation and Development (OECD)	Develop indicators that measure the outcomes and experiences of healthcare that matter most to citizens	Coordination: To what extent does the team managing your hypertension or diabetes appear to be following the same care plan? How often does your regular provider review with you all the medications prescribed to you? How often does the team managing your hypertension or diabetes help coordinate services by other professionals or exams that you need? Patient-Centered Care: How much does the team managing your hypertension and diabetes take into account what is most important to you in managing your health and well-being? To what extent have you found your care plan helpful in managing your health and well-being? Are you involved as much as you want in decisions about your care? Do you receive enough support from healthcare professionals to help you manage your health and well-being?

	Access: How easy is it for you to use the website of your primary care center to search for information or access services?

domain, and b) "Do you receive enough support from health professionals to help you manage your own health and well-being?", from the patient-centered care domain.

Concerning wording adjustments, seven questions scored less than 80%. The discussion with the experts emphasized that the healthcare system in Colombia is not organized to ensure continuity of care with a single professional, but with a team of professionals. Considering this particularity of the healthcare system, some questions were modified to reflect care provided by the health team, and the following two questions were added:

1. Considering the care you have received, in general, how would you rate the medical care provided by your health team in the last 12 months?
2. When you are not treated by the same team, how would you rate the care you receive?
3. Additionally, it was suggested that while the health team could talk to patients about how to take their medications, it was important to verify that the patient understood how to take them. Therefore, a new question was created:
4. In the last 6 months, how often has someone from the team managing your hypertension or diabetes checked that you understood how to take your medication?

Next, a question asking if the patient had ever been referred to a health educator, dietitian, or counselor was removed, based on the fact that these are points of care in the pathway where the likelihood of fragmentation is low.

Subsequently, words that might not be understood by patients were identified and modified. For example, in questions asking about the "number of encounters," the word "encounters" was replaced with "contacts;" and in questions mentioning a "health professional" or "healthcare provider," the phrase was replaced with "the team managing your hypertension or diabetes." Also, the verb "discuss" health goals was changed to "agree on," to suggest interaction with the patient. Furthermore, some rewording suggestions were made to avoid biases in the question ratings. For instance, some questions using the phrase "how easy" were replaced with "how easy or difficult;" and in another case, the intermediate rating option of "just" was replaced with "adequate", to eliminate any possible influence of question style on the patient's response. The resulting instrument contained 28 questions: four to determine access , six to assess continuity, 11 to measure coordination, and seven to evaluate patient-centered care.

Finally, a scoring template was defined for each item, using a Likert scale of five levels, considering that while a higher number of levels is associated with greater internal consistency and test-retest reliability, using more than six does not provide any additional benefit [43].

Once the changes were made, the instrument was organized according to the patient's flow through the pathway, embedded in the other questions, and a section asking for the patient's demographic information was added. This 28-question instrument was then applied in the pilot test.

The pilot test took 12 to 28 minutes to complete, with an average of 17.85 minutes. 14 individuals, aged between 43 and 69 years, with a mean age of 59.92 were involved. Of these, 70% were from Bogotá, Boyacá, and Cundinamarca. These and other characteristics are summarized in Table 2.

Table 2. Sociodemographic Characteristics of Patients Who Participated in the Pilot Test

Characteristic	Category	N	Percentage (%)
Sex	Female	6	42.86
	Male	8	57.14
Department of birth	Bogotá	3	21.43
	Boyacá	4	28.57
	Cundinamarca	3	21.43
	Other	4	28.57
Last educational level achieved	Primary education or lower	7	50.00
	Secondary education or higher	7	50.00

Characteristic	Category	N	Percentage (%)
Monthly household income	Less than $800,000	4	28.57
	$800,000 or more	9	64.29
	No response	1	7.14
Type of social security	Subsidized	4	28.57
	Contributive	9	64.29
	Other	1	7.14
Diagnosis	High blood pressure	7	50.00
	Type II diabetes	3	21.43
	Both	4	28.57

Six patients reported difficulty with some of the questions, and none stated that the questions were offensive or confusing. Among these six patients, four were men, one had no formal education, two had completed elementary school, two had completed secondary school, and one had a university degree. All six had a family income higher than $600 000COP per month.

Difficulties were observed in four questions, particularly with the comprehension of the terms "team," "goals," and "care plan." One patient had difficulty answering questions related to specialist care, as they had not previously been referred to specialists. These difficulties, which were also observed by the interviewer, were addressed by defining the terms, identifying the professionals that make up the healthcare team, and adding a question to determine who had received specialist care. Additionally, the Likert scale was adjusted to ensure measurement points corresponded with the formulation of the questions. The total score of the scale was defined as the sum of the scores between one and five for each item; thus, the final score of the instrument could range from 28 to 140. Higher scores on the scale represented higher levels of integration as perceived by the patients.

The pilot test sample had an adequate balance in their sociodemographic characteristics. No specific pattern was found in the characteristics of the participants who reported difficulty with the questions of the instrument. It was, then, concluded that the difficulties reported by the participants could be addressed without making substantial changes to the instrument, and as a result, a second pilot test was not conducted. Based on the changes made during this process, a final version of the instrument was developed. This would subsequently undergo a validation process which included classical measurement theory and item response theory methodologies, ensuring sufficiently sized samples (see Appendix 2).

Discussion

In Colombia, the healthcare system provides inhabitants with an almost universal coverage that includes health insurance, health technologies, and financial protection [44]. Access to healthcare services is a fundamental right that must be guaranteed by the government. Additionally, healthcare services must be person-centered. The RIA-CCV was developed to define the necessary conditions to ensure the comprehensiveness of care for individuals at risk of cardiovascular cerebrovascular disease by health system agents, [45]. Measuring the degree of integration (absence of fragmentation) in healthcare services is a need and an opportunity to guarantee the commitments of the healthcare system and to improve the achievement of its goals.

According to previous experiences, the characteristics of the RIA-CCV and the evolution of service organization required a new instrument , that would emphasize the critical points of professional or institutional changes. This article outlined the process of developing the instrument to measure patients' perceptions of the integration of care in the RIA-CCV in Bogotá.

The systematic literature review revealed a significant body of literature around the domains proposed by Singer et al. [6], which were adopted in this study. However, these domains were not always named the same way, nor were they evaluated using the same questions. The more than 300 available SS demonstrate the global interest in both incorporating these measurements into evaluations to improve the quality of healthcare services, and in including the voices of patients.

If the domains and concepts are so similar, why are there so many different SS? The review of the questions from the 13 selected SS suggests there at least three aspects to consider: First, it is necessary to adapt the measurement to each context, taking into account the local particularities of the organization of healthcare services. Second, there are different priorities tied to moment and

place. For example, in some countries, access may be prioritized due to limited financial coverage, while in others, coordination is prioritized due to less comprehensive organization and more points of contact. Third, there is a need to have a national or international reference for at least some issues. The free search included the ECV Survey [42], validated for Colombia and considered a national reference; and the PaRIS Survey [17], which is currently used in several countries of the OECD. The former is a national reference for exploring barriers to access to healthcare services, while the latter allows for international comparability.

The expert validation allowed for the adaptation of the instrument to the reality of the Colombian healthcare system. This validation provided improvements in the wording to facilitate understanding questions, avoid biases, and ensure coherence. It also raised questions about the feasibility of ensuring continuity with the same healthcare professional in the health system.

As a result of these, it was determined that the system should guarantee continuity of care through institutions, not individuals, which means that the patient should not be followed by the same professional for all their consultations but rather by the same team. For continuity assessment, this issue may be valid beyond Colombian borders, given the current crisis in the sufficiency and quality of human resources in healthcare.

On the other hand, the pilot test with patients allowed for the identification and correction of difficulties patients encountered when responding to the instrument. This test highlighted the need to define some terms and revise the questions for the evaluation of integration.

Although the instrument may seem lengthy, its structure in sections, with a screening question, allows for only relevant questions to be applied, based on each patient's experience; thus, enabling the instrument to be used in a reasonable amount of time.

The detailed description of the steps in the construction of the instrument aims to provide references and considerations that will be helpful to researchers working in this field. Additionally, it seeks to help readers realize the necessity of following these methodological steps, which enhance the instrument's acceptability when applied.

Measuring integration levels in healthcare services from the patients' perspective is of great importance, as it provides valuable information for making informed decisions regarding chronic diseases, which carry a high risk of fragmentation.

To ensure the validity and reliability of these measurements, instruments must incorporate the particularities of patients and the structure of healthcare systems in their design. In public health, it is crucial to take these properties into account when using instruments to gather information that will be used for evaluating and implementing integrated care policies.

One limitation of this study is that, since the instrument's development process was guided by a particular feature of the healthcare system in Bogotá, the scale's usefulness might be affected if used in settings that do not share similar conditions to this healthcare pathway. Therefore, once the instrument is validated in Bogotá, its validity should be explored in other contexts of the country and in countries with healthcare systems similar to Colombia's.

Ultimately, an instrument was designed to measure the integration of services provided to patients with HT and T2DM in the context of a RIA in Bogotá, based on the local context and the Colombian healthcare system in 2023. This instrument will undergo a validation process in the next phase, which will establish its clinimetric properties through classical measurement theory and item response theory during the implementation of research on fragmentation in service delivery for HT and T2DM patients in Colombia.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the conception, development, and publication of this research.

Contributions of the Authors

All authors of this manuscript contributed to the conception of the study, its data collection, analysis, and interpretation., They also participated in the construction of the manuscript and the approval of the final version.

Statement of Responsibility

This article is the result of original work. Its contents represent the viewpoints of the authors and the findings they made during the research conducted.

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Annexes

Appendix 1. Search Equation

Topic	Equation	Boolean Operator
Continuity of Care	("continuity of patient care" [Mesh]) OR (patient care continuity) OR (continu* ADJ5 care) OR (care continu*)	OR
Integration of Care	("delivery of health care, integrated" [Mesh]) OR (integrated ADJ5 system*) OR (delivery system*, integrated) OR (system*, integrated delivery)	OR
Patient-Centered Care	("Patient-Centered Care" [Mesh]) OR (Care, Patient-Centered) OR (Patient Centered Care*) OR (Person-Centered Care) OR (Care*, Person-Centered) OR (Person Centered Care*) OR (Patient Focused Care)	OR
Health Fragmentation and Health Coordination	((health care fragmentation) OR (fragmentation ADJ3 care) OR (fragmentation) OR (care integration) OR (care coordination) OR (integrated care) OR (coordination ADJ5 care)	AND
Surveys and Questionnaires	("surveys and questionnaires" [Mesh]) OR (questionnaire*) OR (survey*) OR (respondent*) OR ("weights and measures" [Mesh]) OR (measure*) OR (scale*)	AND
PubMed Systematic Reviews Filter	((((systematic review[ti] OR systematic literature review[ti] OR systematic scoping review[ti] OR systematic narrative review[ti] OR systematic qualitative review[ti] OR systematic evidence review[ti] OR systematic quantitative review[ti] OR systematic meta-review[ti] OR systematic critical review[ti] OR systematic mixed studies review[ti] OR systematic mapping review[ti] OR systematic cochrane review[ti] OR systematic search and review[ti] OR systematic integrative review[ti]) NOT comment[pt] NOT (protocol[ti] OR protocols[ti])) NOT MEDLINE [subset]) OR (Cochrane Database Syst Rev[ta] AND review[pt]) OR systematic review[pt])	

Appendix 2. Instrument for Measuring the Perception of Integration in Cardiovascular Care Pathway for Patients with Hypertension and Type 2 Diabetes

Pregunta	Respuestas
1. Teniendo en cuenta el número de contactos con los servicios de salud para su hipertensión o diabetes, ese número de contactos, ¿cómo le parece?	Muy pocos Pocos Adecuados Muchos Demasiados
2. Para los profesionales que lo atienden más frecuentemente, ¿en qué medida está de acuerdo o en desacuerdo con que este número de contactos es suficiente para atender sus necesidades?	En total desacuerdo En desacuerdo Ni de acuerdo ni en desacuerdo De acuerdo Totalmente de acuerdo
3. Cuando pide cita para el manejo de su hipertensión o diabetes, ¿con qué frecuencia es atendido(a) por el mismo equipo de salud?	Nunca Casi nunca A veces La mayoría de las veces Siempre

Pregunta	Respuestas
4. Teniendo en cuenta todos los aspectos relacionados con la atención que ha recibido, en general, ¿cómo calificaría la atención médica que ha recibido de su equipo de salud en los últimos 12 meses?	Mala Regular Buena Muy buena Excelente
5. Cuándo no lo(a) atiende el mismo equipo, ¿cómo califica la atención que usted recibe?	Mala Regular Buena Muy buena Excelente
6. El recordatorio que recibió antes de su última cita, ¿le sirve para no faltar a sus citas?	Nunca Casi nunca A veces La mayoría de las veces Siempre
7. ¿Considera que la atención en salud recibida para el manejo de su hipertensión arterial o diabetes ha sido organizada?	Nunca Casi nunca A veces La mayoría de las veces Siempre
8. ¿Está involucrado(a) tanto como usted quiere en las decisiones sobre su atención?	Nunca Casi nunca A veces La mayoría de las veces Siempre
9. ¿En qué medida está de acuerdo o en desacuerdo con que su plan de atención le ha sido útil para cuidar su salud y bienestar?	En total desacuerdo En desacuerdo Ni de acuerdo ni en desacuerdo De acuerdo Totalmente de acuerdo
10. ¿En qué medida todas las personas del equipo que maneja su hipertensión o diabetes parecen estar siguiendo el mismo plan de atención?	Nunca Casi nunca A veces La mayoría de las veces Siempre
11. En los últimos 12 meses, ¿el equipo que maneja su hipertensión o diabetes concertó con usted metas para su salud?	Nunca Casi nunca A veces La mayoría de las veces Siempre
12. ¿En qué medida está usted de acuerdo o en desacuerdo con que el equipo que maneja su hipertensión o diabetes toma en cuenta lo que es más importante para usted para cuidar su salud y bienestar?	En total desacuerdo En desacuerdo Ni de acuerdo ni en desacuerdo De acuerdo Totalmente de acuerdo
13. ¿Recibe suficiente apoyo del equipo de salud para ayudarle a manejar su propia salud y bienestar?	Nunca Casi nunca A veces La mayoría de las veces Siempre
14. ¿Con qué frecuencia las personas del equipo que manejan su hipertensión o diabetes parecían conocer la información importante sobre su historial médico?	Nunca Casi nunca A veces La mayoría de las veces Siempre

Pregunta	Respuestas
15. ¿Con qué frecuencia recibe información contradictoria de diferentes personas del equipo de salud que atiende su hipertensión o diabetes?	Nunca Casi nunca A veces La mayoría de las veces Siempre
16. ¿Considera que en algún momento las personas del equipo que manejan su hipertensión o diabetes no tuvieron en cuenta información importante de su estado de salud porque no estaba escrita en su historia clínica?	Nunca Casi nunca A veces La mayoría de las veces Siempre
17. ¿Con qué frecuencia el equipo que maneja su hipertensión o diabetes ayuda a coordinar la programación de los servicios con otros profesionales o de exámenes que usted necesita?	Nunca Casi nunca A veces La mayoría de las veces Siempre
18. Cuando usted necesita una cita, un examen o un medicamento para su hipertensión o diabetes, ¿qué tan fácil o difícil es obtener este servicio?	Muy difícil Difícil Ni fácil ni difícil Fácil Muy fácil
19. ¿Con qué frecuencia el equipo que maneja su hipertensión o diabetes revisa con usted todos los medicamentos que le han recetado?	Nunca Casi nunca A veces La mayoría de las veces Siempre
20. En los últimos 6 meses, ¿con qué frecuencia alguien del equipo que maneja su hipertensión o diabetes habló con usted sobre cómo debía tomar su(s) medicamento(s)?	Nunca Casi nunca A veces La mayoría de las veces Siempre
21. En los últimos 6 meses, ¿con qué frecuencia alguien del equipo que maneja su hipertensión o diabetes verificó que usted entendiera cómo debía tomar su(s) medicamento(s)?	Nunca Casi nunca A veces La mayoría de las veces Siempre
22. Cuando faltó a una cita o no reclamó los medicamentos ordenados por el médico, ¿con qué frecuencia alguien del equipo que regularmente atiende su hipertensión o diabetes se comunicó con usted para programar de nuevo el servicio?	Nunca Casi nunca A veces La mayoría de las veces Siempre
23. ¿En qué medida está de acuerdo o en desacuerdo con que el tiempo para obtener una cita con el especialista fue razonable para atender sus necesidades en salud?	En total desacuerdo En desacuerdo Ni de acuerdo ni en desacuerdo De acuerdo Totalmente de acuerdo
24. Cuando usted fue a consulta especializada, ¿con qué frecuencia le pareció que el especialista tenía la información que necesitaba para resolver su problema?	Nunca Casi nunca A veces La mayoría de las veces Siempre
25. ¿Con qué frecuencia el médico general parece estar informado y actualizado sobre la atención que recibió de los especialistas que usted ha visitado?	Nunca Casi nunca A veces La mayoría de las veces Siempre

Pregunta	Respuestas
26. ¿En qué medida está de acuerdo o en desacuerdo con que haber recibido ese contacto luego de salir de urgencias le ayudó a continuar con el manejo de su hipertensión o diabetes?	En total desacuerdo En desacuerdo Ni de acuerdo ni en desacuerdo De acuerdo Totalmente de acuerdo
27. ¿En qué medida está de acuerdo o en desacuerdo con que haber recibido ese contacto luego de salir de hospitalización le ayudó a continuar con el manejo de su hipertensión o diabetes?	En total desacuerdo En desacuerdo Ni de acuerdo ni en desacuerdo De acuerdo Totalmente de acuerdo
28. ¿Qué tan fácil o difícil le resulta usar los servicios en línea del sitio donde le atienden su hipertensión o diabetes?	Muy difícil Difícil Ni fácil ni difícil Fácil Muy fácil