

Evaluation instruments for primary care network structures: an integrative review

Instrumentos de avaliação de estruturação de redes de cuidados primários: uma revisão integrativa

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ABSTRACT The study aimed to identify available instruments in the literature to evaluate the structure of primary health network in health systems. An integrated review of literature was carried out in health sciences, education, and management Databases, as follows: Medical Literature Analysis and Retrieval System Online (Medline), including the Cochrane Library, Embase, PsycINFO, Cumulative Index to Nursing and Allied Health Literature (CINAHL), ABI Inform, Latin American and Caribbean on Health Sciences Literature (Lilacs), and the Business Source Complete (Ebsco). Manuscripts published in English and Portuguese from 1995 to 2019 were included. The final sample contained nine articles, in which eight instruments were identified. They had as a common feature the approach on longitudinality, interprofessional communication, care coordination, access to health services, and quality of care. An emphasis was noted on an instrument developed in the Brazilian health system context as a useful tool to support health care workers and managers in the situational diagnosis of potentialities and fragilities of Primary Health Care and Health Care Networks.

KEYWORDS Health evaluation. Surveys and questionnaires. Primary Health Care.

RESUMO O estudo teve como objetivo identificar instrumentos disponíveis na literatura para avaliar a estruturação de rede de cuidados primários em sistemas de saúde. Foi realizada revisão integrativa da literatura nas bases de dados das ciências da saúde, educação e gestão, a saber: Medical Literature Analysis and Retrieval System Online (Medline) incluindo a biblioteca virtual da Cochrane, Embase, PsycINFO, Cumulative Index to Nursing and Allied Health Literature (CINAHL), ABI Inform, Literatura Latino-Americana e do Caribe em Ciências da Saúde (Lilacs) e Business Source Complete. Foram incluídas publicações em inglês e português no período de 1995 a 2019. A amostra final foi composta de nove artigos. Foram identificados oito instrumentos, os quais apresentavam como características similares a abordagem na longitudinalidade, comunicação interprofissional, coordenação do cuidado, acesso aos serviços de saúde e qualidade do cuidado. Destaca-se um instrumento desenvolvido no contexto do sistema de saúde brasileiro como ferramenta útil para apoiar trabalhadores e gestores de saúde no diagnóstico situacional das potencialidades e fragilidades da Atenção Primária à Saúde e na coordenação das Redes de Atenção à Saúde.

PALAVRAS-CHAVE Avaliação em saúde. Inquéritos e questionários. Atenção Primária à Saúde.

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Introduction

The integration of health systems has been considered an essential component for transformation of practices and qualification of care, being obtained with well-structured primary care and with integrated networks of service provision¹. The existence of a structured primary care network, assuming responsibility for a registered population, has been considered as an indicator of the principle of integration of health systems relating to geographical coverage, which aims at maximizing patient accessibility and minimizing duplication of service utilization².

The proposal of integrated systems is presented as an alternative to hegemonic models, as it seeks to overcome the fragmentation of care, acting in an articulated manner in response to the needs of the population through the coordination of care. Its modeling in regionalized care networks, with defined population and territory, aims to guarantee a comprehensive health supply, with increased access and greater efficiency and quality in care, through relationships and flows established between health services at different levels of health system. The strengthening of Primary Health Care (PHC) has been pointed out as an important measure for the coordination of care and organization of health systems, establishing it in the position of care coordinator and care network organizer³.

Many health systems have set goals that focus on comprehensive health care; and, despite broad support for integration, there is few information on how to achieve successful integration in different contexts and how to evaluate performance towards an integrated system⁴. However, assessing integrated care is a challenge because of the limited availability of tools to measure different aspects of integration and the difficulties inherent in tracking existing tools in the literature¹. In contrast to research areas

that have clear research methods, analyzing a dynamic and multifaceted system can be complex. However, systematic measurement methods are essential for continued integrated care knowledge. The ability to measure and evaluate the consistency of the results obtained in successful integration strategies is critical to making progress in the design and implementation of an integrated health system⁵.

In recent years, the use of instruments to assess health care networks performance has aroused growing interest of researchers and managers in the national and international scenario due to the concern with the improvement of health care quality and the production of knowledge. The results obtained by the application of instruments allow approximations to the perceptions of participants, care models, care and management practices implemented in the health area⁶.

Considering the strategic role of PHC in the context of national and international health, as the care network organizer and care coordinator, it is relevant to evaluate its structure and performance through evaluative tools. In this context, this article aims to identify instruments available in the literature to evaluate the structure of primary care network in health systems.

Methods

The study was designed as an integrative literature review, originated from a broad synthesis of knowledge². The integrative review allows the analysis of studies from different research designs and generates synthesis of available evidence on a given theme, using a narrative analysis⁷.

The review was structured according to the following steps: problem identification, literature search, data evaluation, data analysis and presentation of the synthesis of the knowledge⁸.

The guiding question was: what

instruments are available in the literature to assess the structuring of primary care networks in health systems?

Data collection took place in April 2019. In order to identify the studies, a search was conducted in databases of the health sciences, education and management, namely: Medical Literature Analysis and Retrieval System Online (Medline) including Cochrane virtual library, Embase, PsycINFO, Cumulative Index to Nursing and Allied Health Literature (CINAHL), ABI Inform, Latin American and Caribbean Health Science Literature (Lilacs), and Business Source Complete. As a search strategy, the combination of the following descriptors was adopted: (Community health OR Community care OR Primary care OR Primary health OR Integrated care OR Integrated health) AND (network OR coalition OR partnership).

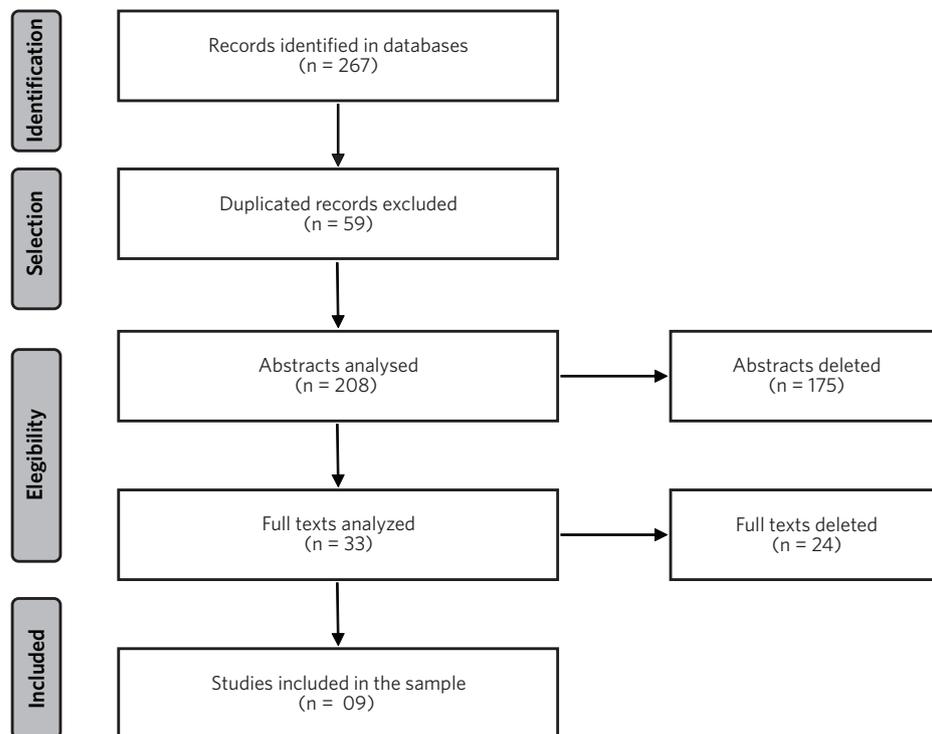
The eligibility of the studies was due to the inclusion of publications in English and Portuguese, from 1995 to 2019, which were available in full for online access. The studies should contain tools for evaluating the structure of primary care network, in

different scenarios and methodological research designs (qualitative, quantitative and mixed methods), validated or not. Studies containing instruments but not referring to the assessment of the structure of the primary care network, review articles, experience reports, theses, dissertations and monographs, abstracts, documents and annals of events were excluded.

The search resulted in 267 records. The references identified were submitted to the EndNote® bibliography manager software. Duplicate studies were excluded (n = 59), with 208 articles left. For the selection, two independent reviewers analyzed the study titles and abstracts. When there was doubt or disagreement, the studies were evaluated in groups by four researchers. According to the eligibility criteria, 33 articles were selected for full analysis. Of these, nine studies were included in the sample, as illustrated in *figure 1*.

For data extraction, an instrument was used, containing the following topics of interest: authors, year of publication, language, objective, design, scenario and name of the identified instruments.

Figure 1. Flowchart of data collection and selection of studies that comprised the sample



Source: Research data, 2019.

Results

In the nine selected studies⁹⁻¹⁷, whose characteristics are shown in *chart 1*, eight instruments were identified to assess the structure of the primary care network in health systems.

Six studies^{9-11,13-15} were performed in the United States of America (USA); two studies¹⁶⁻¹⁷, which correspond to the same instrument, were developed in Brazil; and a study¹² in the Netherlands. As for language, eight are written in English^{9-15,17}, and one is in Portuguese¹⁶.

Chart 1. Characteristics of the studies: authors, year of publication, language, objective, design, scenario and name of the identified instrument. Porto Alegre, 2019

Author/ Year/ Language	Objective	Design	Country	Name of the instrument
Flocke ⁹ (1997) English	Evaluate the psychometric properties of an instrument developed to measure seven key aspects of primary care provision from the perspective of patients and to verify the association of these aspects with patient satisfaction	Multi-method quantitative cross-sectional study	USA	Components of Primary Care Index (CPCI)
Cassady ¹⁰ (2000) English	Assess the adequacy of the Primary Care Assessment Tool-Child Edition (PCAT-CE) instrument by assessing the scope of the main characteristics of primary care services for children and young people	Quantitative cross-sectional study	USA	Primary Care Assessment Tool-Child Edition (PCAT-CE)
Cooley ¹¹ (2003) English	Describe the development and validation of a tool to measure home health care	Cross-sectional study	USA	Medical Home Index (MHI) - Long version
Nikbakht-Van ¹² (2005) English	Assess the opinions and experiences of participants regarding the structure, process and results of palliative care networks in the southwestern Netherlands	Qualitative and quantitative study	Netherlands	Questionnaire with no name specified
Friedberg ¹³ (2008) English	Assess the prevalence of recommended structural capacities among primary care practices and to determine whether prevalence varies between practices of different dimensions (number of doctors) and administrative affiliation with health care networks	Cross-sectional study followed by literature search	USA	Questionnaire with no name specified
Rittenhouse ¹⁴ (2008) English	Examine the extent of infrastructure component adoption among large primary care and other medical specialty groups and their association with the number of available doctors	Quantitative cross-sectional study	USA	Questionnaire with no name specified
Birnberg ¹⁵ (2011) English	Develop primary care assessment scale using Patient Centered Medical Home (PCMH) model	Cross-sectional study	USA	Safety Net Medical Home Scale (SN-MHS)
Rodrigues ¹⁶ (2014) Portuguese	Perform the semantic validation of the health care network coordination assessment tool by primary care, adapted from the evaluation checklist of the degree of integration of health care networks	Cross-sectional study	Brazil	Assessment Tool for the Coordination of Primary Health Care Networks by PHC (Copas)
Rodrigues ¹⁷ (2015) English	Present the results of the construct validation (pilot phase) of the Copas instrument to evaluate the coordination of health care networks by primary care.	Cross-sectional study	Brazil	Assessment Tool for the Coordination of Primary Health Care Networks by PHC (Copas)

Source: Research data, 2019.

The characteristics of the instruments, such as name, sample used, study scenario, dimensions, type of validation, measurement

properties and psychometric values, are presented in *chart 2*.

Chart 2. Features of the instruments: authors, name of the instrument, instrument respondents, study scenario, dimensions and psychometric properties evaluated. Porto Alegre, 2019

Authors	Instrument	Respondents	Study Scenario	Strategy of data collection	Dimensions of the instrument	Psychometric properties
Flocke ⁹ (1997)	Components of Primary Care Index (CPCI)	2.899 users assisted by family doctors	Family Doctor's Offices in Ohio (USA)	Instrument applied in person by researchers at study sites	Multidimensional (4): interpersonal communication, knowledge about the patient, coordination of care, preference of the patient to care with his/her family doctor	Internal consistency
Cassady ¹⁰ (2000)	Primary Care Assessment Tool-Child Edition (PCAT-CE)	450 parents and caregivers of children and young people under 18	Primary Care Services in Washington, DC (USA)	Instrument applied by telephone	Multidimensional (5): Longitudinality/relationship, accessibility of first contact, coverage of available services, coverage of services provided, coordination	Content and construct validity, internal consistency
Cooley ¹¹ (2003)	Medical Home Index (MHI) - Long version	Doctors and non-doctors members of the health team of 43 health units	43 pediatric primary care units in various states of the USA	Instrument applied in person by researchers at study sites	Multidimensional (6): organizational capacity, management of chronic conditions, coordination of care, community extension, data management, improvement of quality	Construct validity and internal consistency
Nikbakht Van ¹² (2005)	Questionnaire	59 respondents, including managers and health professionals	8 local palliative care networks in Rotterdam (Netherlands)	Self-applicable instrument sent by e-mail	Contains 200 items divided into structure (demographic characteristics, history, beginning, development stage, resources and organizations participating in the network), process (organization and administration, cooperation and external relations) and result (shared objectives and perceptions, demands for care, quality of cooperation, improvement of care services, established agreements, results associated with patients and organizations, expertise and funding)	No psychometric validation reported
Friedberg ¹³ (2008)	Questionnaire with no name specified	308 doctors working in primary care	Primary Care Units in Massachusetts (USA)	Self-applicable instrument sent to participants	Multidimensional (4): patient care and reminders, culture of striving for quality, improved access, electronic health records	No psychometric validation reported
Rittenhouse ¹⁴ (2008)	Questionnaire with no name specified	291 health service managers	Independent medical groups and practice associations in the USA	Instrument applied by telephone	Multidimensional (7): personal doctor, doctor-directed medical practice with responsibility for ongoing patient care, comprehensive patient guidance, coordinated/integrated care, quality and safety with evidence-based decisions, timely access to care, and improved communication methods between patients and healthcare team, payment should be commensurated with patient care and outcomes	No psychometric validation reported
Birnberg ¹⁵ (2011)	Safety Net Medical Home Scale (SN-MHS)	Health service managers assisted by the health team	65 rural and urban clinics (USA)	Self-applicable instrument sent by e-mail	Multidimensional (6): access and communication, patient and record follow-up, care management, referral testing and follow-up, quality improvements, external coordination	Content validity, internal consistency and convergent validity

Chart 2. (cont.)

Ro- drigues ¹⁶ (2014)	Assessment Tool for the Coordination of Primary Health Care Networks by PHC (Copas)	Health pro- fessionals linked to the Family Health Strategy	Health Units with Family Health Strat- egy in Minas Gerais (Brazil)	In person self-applicable instrument	Multidimensional (5): population, Primary Health Care, support systems, logistics systems, management system	Internal consistency, content valid- ity, convergent and discrimi- natory, ceiling and floor test
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Source: Own elaboration.

The eight instruments that evaluate the structuring of primary care networks in healthcare systems are: Components of Primary Care Index (CPCI)⁹, Primary Care Assessment Tool-Child Edition (PCAT-CE)¹⁰, Medical Home Index (MHI) – long version¹¹, Safety Net Medical Home Scale (SNMHS)¹⁵, Assessment Tool of the Health Care Network Coordination by PHC (Copas)¹⁶⁻¹⁷, three questionnaire-type instruments, without specified names¹²⁻¹⁴. Among the issues addressed, most of the instruments included longitudinality assessment, interprofessional communication, care coordination, access to health services and quality of care.

It is identified that six instruments were answered by health service professionals, managers or employees¹¹⁻¹⁷; and two by service users⁹⁻¹⁰. Three instruments were applied in person at the study sites^{9-11,16-17}, three were sent by email^{12-13,15} and two were answered by telephone^{10,14}. Five instruments were evaluated for psychometric properties^{9-11,15-17}, and, in one of them, there was only semantic validation and pilot test¹⁶⁻¹⁷. One of the studies proposed a safety net evaluation scale in palliative care¹², without validating it, and three studies applied instruments in a questionnaire format to obtain the data¹²⁻¹⁴.

Discussion

It was found that the studies were concentrated in the USA^{9-11,13-15}, one being Dutch¹², and

two are Brazilian and deal with the same instrument¹⁶⁻¹⁷. The time interval between publications was approximately three years, though as of 2015, no studies on the subject were found. It is assumed that there is no systematic culture of assessment through instruments in health services, or, if any, the results have not been disseminated in scientific circles.

During the study period, eight instruments were found to measure the components of the structuring of primary care networks⁹⁻¹⁷, and, of these, five underwent some type of validation test^{9-11,15-17}. Validated instruments are useful resources as their items have been tested for psychometric qualities. Its use can save researchers time and work¹⁸, besides subsidizing managers, health professionals and researchers in the choice of instruments that are appropriate for their purpose.

The strength of the results obtained in a study depends on the instrument chosen. Therefore, validated instruments regarding psychometric properties may bring more robustness to the research results¹⁹. The performance of the results is given by the validity and reliability of the instrument. Validity is related to the accuracy of measuring what the instrument intends to measure; reliability assesses whether instrument measurements are as accurate as possible. Validity is given by determining the representativeness of items expressing content. This means that this type of validation determines whether the content of a

measuring instrument effectively exploits the requirements for measuring a particular investigated phenomenon. In turn, reliability is measured as to the internal consistency of the items and the stability in time and space, indicating aspects about coherence, accuracy, stability, equivalence and homogeneity²⁰.

The identified instruments had different study scenarios involving primary care and explore aspects through dimensions such as communication and information, patient knowledge, care coordination, management systems, among others.

The CPCI⁹ instrument was developed to measure various components of primary care from the patients' perspective. Content validation was performed by an expert committee and a pilot testing with patients who visited the family doctor. Factorial analysis of their items resulted in four stable and internally consistent dimensions, namely: interpersonal communication, doctor's knowledge of the patient, care coordination, and bonding. Each of the CPCI scale scores was significantly associated with patient satisfaction by consulting the family doctor. Dimensions are associated with patient satisfaction. However, the items related to time and frequency of medical consultation did not have a strong association with the dimension of patient satisfaction. The internal consistency of the scale scores is good, and the applicability of the instrument is high, given the small number of items.

The PCAT-CE¹⁰ consists of 26 items, subdivided into five domains. It was promising for PHC assessment by caregivers or guardians of children. PCAT-CE has been used in countries such as the USA, Spain and South Korea to assess essential and derived attributes of PHC¹⁰.

The MHI – long version¹¹ consists of 25 items and considers home care as a clinical practice that sets new standards for PHC directed at child health. The study describes the development and validation of a tool to evaluate doctor's offices based

on organizational capacity, chronic condition management, care coordination, communication, information management and quality improvement. In the sample of the investigated practices, the MHI was considered a consistent instrument, with acceptable reliability and validity for the child's PHC practices. However, the authors¹¹ recommend that, in order to evaluate the implementation of MHI, it is necessary to study its correlation with variables involving care processes and outcomes in large care networks.

A questionnaire-type instrument was used to assess attributes of the Patient-Centered Medical Home (PCMH)¹³ model. The purpose of the instrument was to assess the prevalence of recommended structural capacities among primary care practices and to determine whether prevalence varied between practices of different quantity and quality dimensions and care networks, medical appointments, patient records and appointment reminders. It is aimed at patients using specific care technologies. The questionnaire can be applied to measure the effectiveness and structure of service delivery in large groups within integrated care. The capabilities investigated do not address all the potential attributes of the PCMH Model. The authors did not report psychometric evaluation of the instrument items.

The instrument that investigated only the infrastructure components of the PCMH model is a questionnaire developed from data from a large North American study on medical organizations (National Study of Physician Organizations 2006-2007) to assess the extent of implementation of care components in the domiciliary, allied to primary care and its association with the supply and adequacy of doctors' sizing¹⁴. The study did not report psychometric assessment of the questionnaire.

The SNMHS¹⁵ consisted of 52 items, 16 cores and organized into 6 domains. The instrument demonstrated reliability and

convergent validity to evaluate the adoption of home medical care. It aims to provide useful information to guide health systems and establish incentives, to allocate resources in the organization and meeting the demands of populations, especially low-income ones. The results obtained with the application of the SNMHS instrument can provide detailed description related to home care safety. However, the initial validation of the SNMHS does not allow generalizations¹⁵.

The Copas¹⁶⁻¹⁷ was the only Brazilian instrument found in this review. It assess the coordination of Health Care Networks (RAS) through PHC. Although it was built and validated based on a checklist for assessing the degree of integration of the RAS, the Copas makes it possible to assess PHC's ability to coordinate networks by placing it at the center of a process of integrating the various points of attention¹⁶. The instrument has 78 items in 5 dimensions. Its elaboration and validation process involved two steps: semantic validation and pilot testing. The instrument was comprehensive, containing the dimensions of health care management coordination (population, primary health care, support systems, logistics systems, and management systems). The Copas is a valid and reliable instrument and can be used by researchers, managers and health professionals to audit and improve the coordination of health services. However, new applications are needed, in a larger sample, in order to attest to its validity¹⁷.

An unnamed instrument¹² considered the scarcity of scientific evidence related to the structuring of palliative care networks in primary care in the Netherlands. Accordingly, the Dutch Ministry of Health has initiated a five-year program for palliative care, based on the founding and funding of Centers for the Development of Palliative Care. These centers were structured around important services such as university hospitals and cancer treatment centers. The construction of the instrument was part of

a program to develop a regional network to integrate palliative care services into the health system. No psychometric tests of the instrument were reported.

Although the instruments identified differ according to the population and the scenario studied, there are characteristics that are common. The literature indicates a number of principles, such as adequate service delivery, geographic coverage, patient focus, organizational culture, performance evaluation, multiprofessional teams, financial management, governance, empowerment, and building practices for integrated system organization^{2,21}, which allies with the characteristics presented in the instruments identified in this study.

The integration of care presupposes prolonged contacts between professionals and the reference population, through various forms of bonding and follow-up, diversifying forms of approaches. In this context, the longitudinality of care is identified, which results from the coordination of various practices and technologies offered, in different spaces, in order to compose a coherent and effective action, without losing focus on the user's condition at all times²².

The measurement of integration also provides for a more precise definition of the role and scope of responsibility of health professionals and units, providing quality care according to the specificities of each user. The care integration formats are oriented towards the attainment of ever higher standards of effectiveness in the PHC environment, home care services, child health and palliative care. The focus on the patient and therapeutic plans, aligned with the needs of each population, allows the monitoring of the impact of continued treatment and the performance evaluation of those involved in the care integration process²³.

Moreover, among the similarities of the identified instruments, the coordination attribute stands out, characterized as the articulation between health care services and actions, aimed at a common goal. Thus, conducting the

assessment of care coordination allows measuring the quality of an integrated network, from PHC to the other levels of care, so that different practices are continuously perceived and experienced by the patient, appropriate to their health care needs and compatible with your personal expectations among the services^{3,24}.

Considering that the objective of the health systems structuring and management processes is based on the knowledge of the population profile, it is essential to master the information systems about the patient and his family, which was also identified in the instruments^{13,16}, either through an electronic medical record or an identification card. These strategies increase the health system's ability to plan effective actions and produce impacts on patients' health.

The analysis of interaction between different professionals is identified in the instruments^{11,12,14} and its common objective is to measure the clinical accountability of its members and their insertion in the structure and participation in integrated systems. The concept of clinical co-responsibility in the integration of health services is based on the articulation of the practices of managers and professionals directed to the demands of the population, with integrated care being the strategy that meets these needs.

Finally, an appropriate instrument to assess primary care networks in health systems is one that meets the proposed objectives in a scenario compatible with the researched reality, in order to develop knowledge that guides decision making and can be scientifically recognized.

In the Brazilian context, we highlight the Copas^{16,17}, as it is a complete instrument, developed in Brazil, based on the guidelines of the Unified Health System (SUS) and originally built in the Portuguese language. Therefore, it can be a useful tool to support health workers and managers in the situational diagnosis of PHC potentialities and weaknesses and in the coordination of care networks.

Final considerations

The results of this study allowed us to identify eight instruments available in the literature that can support researchers, managers, health professionals and users interested in using tools to assess the structure of primary care network in health systems. The instruments generally addressed aspects related to longitudinality, interprofessional communication, care coordination, access to health services and quality of care.

The limitations of the study are related to the delimitation of the Portuguese and English languages in the eligibility criteria, which may have excluded studies considered important. However, this review presents important findings that may help achieve health services integration. Assessment scales are important tools for clinical practice and research in different areas of knowledge. Selecting instruments that provide valid and reliable measures increases the strength of results and reinforces decision making.

Continuous progress towards an integrated care system depends on the ability to contrast and compare the success of strategies used at different levels and in different health contexts. This success can be achieved through consolidated measurement approaches. Assessing the success of integration strategies consistently provides better health system design with better health outcomes for patients.

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Collaborators

Lima MADS (0000-0002-3490-7335)* contributed to the design and planning of the study, data analysis and interpretation, drafting, critical review of the content, and approval of the final version of the manuscript. Marques GQ (0000-0003-2567-4602)* contributed to the conception and planning of the study, data analysis and interpretation, drafting, critical review of the content and approval of the final version of the manuscript. Damaceno AN (0000-0002-4681-0602)* contributed to data analysis and interpretation, drafting,

critical review of the content, and approval of the final version of the manuscript. Santos MT (0000-0002-3336-050X)* contributed to data analysis and interpretation, drafting, critical review of the content and approval of the final version of the manuscript. Witt RR (0000-0002-3893-2829)* contributed to the conception and planning of the study, drafting, critical review of the content and approval of the final version of the manuscript. Acosta AM (0000-0002-4816-6056)* contributed to data analysis and interpretation, drafting, critical review of the content, and approval of the final version of the manuscript. ■

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