ORIGINAL ARTICLE

Care Coordination in Primary Care for individuals with Chronic Diseases

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ABSTRACT

Objective: to analyze the role of Primary Care (PC) in care coordination within the healthcare network for individuals with chronic diseases. Methods: This qualitative study involved managers and healthcare providers working in PC across two health regions in the state of Espirito Santo, Brazil. Data were collected between June 2020 and June 2021 through semi-structured interviews conducted individually via video call applications. Data were analyzed using Braun and Clarke's thematic analysis, aligned with relevant literature on the subject. Results: Participants highlighted challenges in developing care coordination across all pillars of this attribute (clinical coordination, administrative/organizational coordination, information coordination). These challenges were exacerbated during the COVID-19 pandemic. Conclusions: The role of PC in coordinating care for individuals with chronic diseases remains fragile, significantly impacting the delivery of continuous and comprehensive care that meets the actual needs of users.

Keywords: Primary health care, Chronic disease, Health care models.

INTRODUCTION

In recent decades, there has been a global shift in the epidemiological profile, marked by a significant increase in non-communicable diseases (NCDs), responsible for 71% of global mortality each year[1]. Individuals with chronic diseases are considered frequent users of health services and often require assistance from various professionals across different points of care within the healthcare network over an extended period. Thus, they are more likely to face challenges in care integration, experiencing fragmented care, which increases the risks for complications and mortality[2].

In Brazil, discussions around organizing the healthcare network have intensified in the 21st century to address the fragmentation of healthcare and management, with Primary Care (PC) positioned as the communication center for coordinating care[3].

Among the essential principles of PC proposed by Starfield[4] - including first-contact care, longitudinality, comprehensiveness, and care coordination - care coordination has been highlighted as a crucial element in managing chronic diseases. It facilitates continuous and integrated care while contributing to reduced healthcare system costs and minimizing conflicting treatment plans[5-7].

Care coordination encompasses several concepts in the literature. This study adopts the definition of harmonious collaboration among health services invol-

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ved in providing care to individuals, regardless of the location of these services, to achieve a common goal without conflicts, ensuring continuous, timely, and integrated care[4,8,9]. Additionally, care coordination can be classified into two dimensions: vertical coordination, which involves interactions between different levels of care, and horizontal coordination, which focuses on actions concentrated within the same level of care[10].

Thus, there is an imperative need for research that explores the potential and challenges of PC in coordinating care for individuals with chronic diseases, as evaluating the performance of the health system is fundamental for effective health planning. From this perspective, this research seeks to contribute to the analysis of this PC principle, emphasizing the processes of care integration within the healthcare network. Specifically, this study aims to analyze the role of PC in coordinating care within the healthcare network for individuals with chronic diseases in the state of Espirito Santo, Brazil.

METHODS

This descriptive qualitative study aimed to interpretatively explore the coordination of care by PC in two health regions of Espirito Santo: the North and Metropolitan regions.

The Regionalization Master Plan (*Plano Diretor de Regionalização*, PDR) in effect during this research divided the state of Espirito Santo into four health regions: North, Central, Metropolitan, and South. The North region included 14 municipalities, while the Metropolitan region encompassed 20 municipalities[11]. The North region is the least populous, with the lowest human and economic development indexes in the state, as well as significant care gaps. In contrast, the Metropolitan Region is the most populous and has the highest economic and social development indexes in the state, despite notable intra-regional disparities[11,12].

The selection of these regions is justified by their involvement in the process of organizing their healthcare networks through Health Care Planning (Planificação da Atenção à Saúde) and the presence of a *Unidade Cuidar* - a specialized reference outpatient care unit for patients with high-risk chronic diseases - within their territories. This includes all 14 municipalities in the North region and eight municipalities in the Metropolitan region[13].

Of these municipalities, five in the North region and three in the Metropolitan region were selected to participate in this study based on the following criteria: population size and their role as regional reference centers. This ensured the inclusion of large, small, and hub municipalities in alignment with the PDR in effect during the time of this research.

Data were collected from June 2020 to June 2021 through semi-structured interviews with key stakeholders in the municipalities involved in the management and delivery of healthcare for individuals with chronic diseases. Participants included municipal health managers, PC coordinators, and healthcare providers. Individual interviews were conducted via video call applications at a time and date chosen by the participants, following their consent and the signing of an informed consent form (ICF), in adherence to social distancing measures required during the COVID-19 pandemic.

The interviews were recorded and transcribed verbatim, preserving the language used by the research participants.

The interview scripts used in this study were based on an adapted version of the script by Aleluia[14]. A tracer event – a stroke caused by hypertension - was selected during the development of the script. This event was chosen due to its high prevalence (currently the second leading cause of death in both Brazil and Espirito Santo) and the established care pathways in PC that can prevent the disease[15-17].

The COVID-19 pandemic (declared in March 2020 by the World Health Organization) had a direct impact on the organization of services and PC activities during this study, significantly affecting both data collection and participants' responses.

The managers interviewed were those holding the position of health secretary or PC coordinator in the selected municipalities. Healthcare providers were appointed by the PC coordinator of each municipality based on the following criteria: in-depth knowledge of the local health system, sufficient time working in the municipality to establish connections with the community and gain insights into the challenges of the local care network, and agreement to participate in the study. Individuals who were absent due to leave or vacation during data collection were excluded.

It is worth noting that in this sampling process, empirical saturation was reached in the responses regarding the functioning of the network in the studied regions.

The pillars, dimensions, and variables used in data collection and analysis encompass central elements based on care coordination pillars developed by Vargas et al[18] and their components according to the dimensions and variables proposed by Bousquat et al[5]. These include: clinical coordination, which refers to the provision of continuous and complementary care across levels of care, stemming from a strengthened PC; administrative coordination, which encompasses the flows and organization of healthcare network services that enable integration between different levels of care to ensure continuous care for users; and the information coordination, which pertains to various strategies that ensure user information is available to all professionals across all points of care providing assistance to the same individual (Table 01).

For data analysis, the thematic analysis technique proposed by Braun and Clarke was used[19], anchored in a deductive theoretical approach based on the central elements of coordination described below (Table 1). The following steps were taken: (1) familiarization with the data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report. The aim was to identify, analyze, and report the main themes present in interviewees' statements, through an organized and detailed description of the findings in the data. It is important to highlight that these steps were not a linear process but rather a recursive one, where movement between the phases occurred as necessary[19].

Table 1 - Pillars, dimensions, and variables used for data collection and analysis.

Pillars	Dimensions	Variables	Source
Clinical	Position of PC within the system	PC as a preferred gateway to the region	Managers and health-care providers
		Access to specialized outpatient care (*Atenção Ambulatorial Especializada*, AAE) depends on referral from PC	
		Responsible for care coordination	
	Problem-solving capacity of PC	Laboratory tests collection at the basic health units	Healthcare Providers
		Electrocardiogram at basic health units	Healthcare Professionals
		Dispensation of medication for hypertension at basic health units	Healthcare Providers
		Enough medication for hypertension	Healthcare Managers and Providers
		Community health agents (CHAs) actively search for individuals with hypertension	Healthcare Providers
		Blood pressure measurement at all appointments	Healthcare Providers
		Cardiovascular risk stratification	Healthcare Providers
		Kidney disease risk assessment	Healthcare Providers
		Health education groups for individuals with hypertension	Healthcare Providers
		Use of clinical protocols for hypertension	Healthcare Managers and Providers
		Organization of care for hypertension patients based on risk classification	Healthcare Managers and Providers
	Problem-solving capacity after stroke	Follow-up of all stroke patients in the area	Healthcare Providers
		Provision of rehabilitation actions	Healthcare Managers and Providers
		CHAs conduct home visits after hospital discharge	Healthcare Providers
		Physicians or nurses conducts home visits after hospital discharge	Healthcare Providers
		Support from the Family Health Support Center	Healthcare Managers and Providers

Administrative/ Organizational	Organization of pathways for AAE	Guarantee of timely referral to other levels of care	Healthcare Managers and Providers
		Defined care pathways	
		Integration of services in the region	
		Timely referral to cardiology, neurology, and rehabilitation	
		Referral to AAE of patients with severe, refractory, or secondary hypertension	
		Standardized and facilitated pathway for patient access to AAE	
		Queue monitoring for AAE	
		Integration of PC in the Emergency and Urgency Network	
	Integration between teams and services	PC team is informed of a patient's hospitalization	Healthcare Managers and Providers
		PC physicians monitor patients during hospitalization	Healthcare Managers and Providers
		PC team receives hospital discharge report with therapeutic plan	Healthcare Managers and Providers
		Upon discharge, the patient is instructed to seek for PC services	Healthcare Managers and Providers
		PC physicians contact a AAE specialist to exchange information	Healthcare Providers
		PC team receives written information from consultations with a specialist	Healthcare Managers and Providers
		Joint education activities of PC and AAE professionals	Healthcare Managers and Providers
		PC team is notified the individual's care in the Emergency and Urgency Network service	Healthcare Managers and Providers
Informational Continuity	Instruments for informational continuity	Use of electronic health records	Healthcare Managers and Providers
		Use of a clinical protocol	
		Recording of the hypertension diagnosis in the medical record	

Source: Adapted from Bousquat et al[5].

This project was approved by the Research Ethics Committee of the Federal University of Espirito Santo under Opinion no. 3.647.975. Participants were informed about the purpose of the research and assured of their confidentiality, anonymity, and the right to participate or withdraw, as established by Resolution 466/12 of the National Health Council[20].

RESULTS

The sample consisted of 24 participants, with 41.7% (10) being managers (G1 to G10) and 58.3% (14) being healthcare providers (P1 to P10). Among the managers, 80% (8) were women, 30% (3) held the position of municipal health secretary, and the remaining held the position of PC coordinators. The longest tenure in management was 14 years, and the shortest was three months, with 80% having a background in health-related fields. Among the healthcare providers, 71.4% (10) were women, 64.3% (9) were nurses, and 35.7% (5) were physicians. The longest tenure in PC was 11 years, and the shortest was six months of experience.

After analyzing the interviews, thematic categories were proposed according to the pillars of care coordination as described (Table 01).

Mechanisms for integrating the health care network in Espírito Santo

To better understand the results obtained in this investigation, it is necessary to present some aspects of the organization and mechanisms of the healthcare network in the state of Espirito Santo.

In addition to the regional configuration established by the PDR, another form of intermunicipal coordination is the intermunicipal consortia, which are mainly organized to offer specialized care. Regarding the organization of flows for specialized outpatient care (*Atenção Ambulatorial Especializada*, AAE), each municipality has a regulation center responsible for referrals to services provided by the municipality itself, consortia, and the state. Specifically concerning the services provided by the state, during this research, the implementation of the Territorial Formative Self-Regulation (*Autorregulação Formativa Territorial*) was in progress. This process involves the use of a computerized system (MvSoul) for referrals by the PC physician directly to the regulating physician, maintaining communication between both and updating the PC professional about the patient[21].

Additionally, in the organization of the care network for individuals with chronic diseases, the state established the *Rede Cuidar* in the health regions in 2017 through the Health Care Planning process. This led to the implementation of three Comprehensive Health Care Units (*Unidades de Cuidado Integral à Saúde*, UCIS) in the state. The UCISs are intended for individuals with chronic diseases classified as high and very high risk by PC, according to pre-established flowcharts[13].

Clinical Coordination

- Position of PC within the system and its capacity to resolve issues for patients with hypertension.

In general, PC serves as the entry point to the healthcare system in both regions of the study. In the care of individuals with hypertension, participants highlighted some actions developed to prevent complications resulting from hypertension, such as stroke. Regarding the organization of care, in the North region, participants mentioned the implementation of risk classification for patients with chronic diseases, including assessments of cardiovascular and renal risk, based on the state proto-

col of the *Rede Cuidar* in the region. This protocol serves as a guiding framework for organizing care actions. Through this classification, the frequency of medical and nursing consultations, the need for laboratory tests, and referrals to AAE are determined. In the municipalities of the Metropolitan region studied, only two healthcare providers reported conducting cardiovascular risk assessments for hypertensive patients following the guidelines of the relevant medical societies.

Regarding the provision of medical consultations in the Family Health Strategy (*Estratégia de Saúde da Família*, ESF), Brazil's primary care model, participants from both regions reported ensuring access to these consultations for individuals with hypertension, with Community Health Workers (known as Community Health Agents in Brazil, or CHAs) conducting active follow-up with patients who miss their appointments. However, in the North region, this follow-up is only carried out for patients who have one or more comorbidities associated with hypertension. Providers from four municipalities (covering both regions) reported political interference in the scheduling of medical appointments, intending to favor some individuals. According to participants, this practice undermines access for other patients to the service.

"[…] Although it is an old and large municipality, it is a city, like, with the characteristics of a rural town, you know? So, I was shocked to perceive political interference in the Family Health Strategy *services […] if you are not a careful person, even your schedule is modified, they add people on your schedule, they bring people for you to see if you let them." (P6)*

The availability of laboratory test collection in Basic Health Units (*Unidade Básica de Saúde*, UBS) – primary care centers in Brazil - occurs only in two municipalities in the North, though this was interrupted during the pandemic, with the collection being shifted to other support points within the healthcare network. In the other municipalities of both regions, tests are collected at centralized laboratories, mainly located in the municipal headquarters. Regarding the Electrocardiogram (ECG), it is only performed at the UBS in two municipalities in the North.

Participants mentioned health education groups primarily aimed at individuals with hypertension and diabetes mellitus before the pandemic, which included measurements of anthropometrics, blood pressure, and blood glucose testing, consultations with a physician and nurse, as well as medication dispensation. Only one municipality in the Metropolitan region reported not conducting health education activities, even before the pandemic.

Participants from all municipalities, except one in the North, reported that medications were dispensed at the UBS. However, most participants in both the North and Metropolitan regions mentioned a shortage of essential medications for hypertension since the onset of the COVID-19 pandemic.

Due to the pandemic, many services at UBSs were suspended for a period, and participants reported significant impacts on the health conditions of individuals with chronic diseases, including the occurrence of complications.

"[..] we spent about six, seven months without scheduling an appointment, working with spontaneous demand only, [..] almost the entire schedule was dedicated to COVID patients or those with suspected

COVID. *Then the impact we see [..], in one week, two patients with sequelae of a recent stroke. [..] a patient who had a stroke, a patient who had a hypertensive crisis and ended up in the emergency room, a patient with uncontrolled diabetes who started developing ulcers and complaining of worsening vision. So, we have seen, for sure, the reflection of the pandemic in this sense." (P10)*

- Position of PC within the system and its capacity to manage cases after a stroke

When individuals experience a stroke, the most common points of entry to care are the basic health units and urgent and emergency services. The choice depends on factors such as the severity of the case and the distance from the patient's residence to the nearest health service. In one municipality in the North, interviewees indicated that the preferred entry point for stroke cases is the emergency department of the state hospital, which serves as a regional reference and offers neurology services.

Participants from both regions reported that, in most cases after a stroke, CHAs are the professionals responsible for identifying whether patients were hospitalized for complications and whether they returned to the community. Participants in the North highlighted challenges such as a shortage of CHAs, leading to uncovered areas and compromising PC's ability to monitor these patients effectively.

In general, participants reported that follow-up care for post-stroke patients by PC primarily consists of home visits by team professionals (physicians, nurses, nursing technicians, CHAs) for patients with mobility difficulties and routine consultations at the basic health unit for those able to travel there.

Regarding the rehabilitation actions typically required after a stroke, in the North, services primarily focus on physical therapy. The main challenges identified in most municipalities include the lack of home-based physical therapy, insufficient availability of appointments, and difficulties in transporting patients to receive care. In one municipality in the North, participants mentioned the *Programa Melhor em Casa* (Better at Home Program), which offers home care aimed at training caregivers of patients with more severe stroke sequelae.

"For us here, as I work in the countryside, physical therapy is one of the biggest bottlenecks we have. Because in addition to the slot for physical therapy, I need to guarantee transportation for this patient." (P7)

In the Metropolitan municipalities, most participants reported the presence of a physical therapist in the UBS, which facilitates access to rehabilitation services. Additionally, two municipalities have centralized speech therapy and nutritionist services that provide support to PC teams.

Among the Metropolitan municipalities studied, none have a Family Health Support Center (*Núcleo de Apoio à Saúde da Família*, NASF). In the North region, two municipalities have NASFs, but participants noted challenges in their proper functioning, such as professionals performing other simultaneous duties (e.g., outpatient care) in other sectors of the municipal health network, which reduces their availability to matrix support.

"NASF should be a support for Family Health strategies and most of the professionals who are in the NASF *cannot under-*

stand the performance of the NASF*. And what does the municipality do? It takes professionals who are already within the staff and puts them there as responsible as an NASF member […]. So, teams often have difficulty to engage these support professionals to solve anything." (G4)*

Administrative/Organizational Coordination

In general, interviewees reported weaknesses in the role of PC as the care coordinator within the health care network for individuals who have experienced a stroke. The main challenges highlighted include physician turnover, poor integration between specialists and PC physicians, lack of guidance for users to return to PC after hospital discharge or consultations at the specialized outpatient consultations, patients not recognizing PC as the reference for organizing their care, placing responsibility on patients to seek the basic health unit after discharge, and insufficient training of some professionals.

- Organization of pathways for specialized outpatient care (*Atenção Ambulatorial Especializada*, AAE)

According to interviewees, there is a fragility in defining referral flows for the AAE, with easier access to specialties provided by intermunicipal consortia. As a result, services offered by the State Health Department (Secretaria Estadual de Saúde, SESA) are only sought when vacancies in the consortia are exhausted or when a specific specialist or exam is unavailable. Participants frequently mentioned the limited availability of outpatient consultation slots, particularly those under state management, as an ongoing challenge.

All municipalities have a regulation center to organize the care flow. At the time of the interviews, the state was implementing formative self-regulation proposed by SESA, which aimed, according to participants, to decentralize referrals to the AAE and exams, allowing these processes to occur directly at the UBS via a computerized system. Although participants identified potential benefits in this new regulation model for outpatient access - such as faster referrals and closer communication between PC physicians and regulatory physicians - the implementation of formative regulation was interrupted by a change in state administration.

- Integration between teams and services

In general, participants reported that communication among professionals within the PC team flows smoothly, with most interviewees highlighting team meetings as a formal space for case discussions that foster integration.

Conversely, integration between different levels of care was identified as a challenge, as participants reported the absence of joint activities or direct contact between professionals, citing only occasional experiences with specific services. In small municipalities in both regions, the physical proximity between services was seen as a facilitating factor in the communication process.

The most used communication mechanisms, according to participants, are phone calls, WhatsApp messages, and especially reference and counter-reference guides. Regarding phone usage, weak phone signals in areas farther from urban

centers and the lack of telephones in some units were mentioned as factors that hinder communication with other points of care.

As for the reference and counter-reference guides, participants reported that referrals are made exclusively by PC professionals. The absence of counter-referrals from other levels of care to PC was highlighted as a limiting factor for care coordination and quality, leaving PC teams to rely on patients' accounts of procedures performed during hospitalizations or specialized outpatient consultations (AAE). In the Metropolitan Region, which includes municipalities with Pomeranian populations, this issue is exacerbated by language barriers.

"*The patient goes back with the exam, with the prescription of our colleague who served them and I get no feedback. Nothing at all. […] There is no counter-referral of the specialty to Primary Care. The Primary Care physician is often seen as a… I do not know, so our importance is not yet well understood, you know? (P6)*

"*[…] the counter-referral of this patient when they return is sometimes very scattered […], this patient who suffered a stroke went to neurology, who offered guidance to the patient. It would be utopian and to very naive to think that I would get this neurologist to counter-reference me with their therapeutic follow-up plan […] because many times this communication is lost because the patient cannot report […] And you don't have to know either, you know?" (P10)*

"Those poor professionals…they face a lot of difficulties whenever a patient comes back. Because most of them, especially in the rural area, do not speak Portuguese well, many of them, the older ones, speak Pomeranian, so they have to take a translator" (G9)

Only one municipality in the Metropolitan region reported counter-referrals, which are provided when care is delivered at a specific philanthropic hospital, as this is one of the requirements in the contract.

It is important to note that interviewees from the North region pointed out the existence of counter-referrals for hypertensive users classified as high and very high risk (either before or after the stroke), who are referred to the local care unit from the *Rede Cuidar*. In contrast, participants from the Metropolitan region mentioned that this process occurred at one point but no longer exists.

"We got a care plan at the time with the Care Unit for a little while but afterward things went awry too." (G9)

Information Coordination

- Instruments for informational continuity

Participants from all municipalities in the North region mentioned the availability of electronic health records (EHR) within the network as a tool that would enable the accessibility of user information. However, they highlighted weaknesses such as the lack of interoperability between EHRs and other computerized systems and care points; connectivity issues; limited availability of computers in the units; and the concurrent use of electronic and paper records, with priority given to entering information in the paper records. In the Metropolitan region, participants from two municipalities reported the existence of EHR in some units, with the process still in the expansion phase.

Table 2 – Summary table of the main findings of the investigation.

Pillars	Dimensions	North Region	Metropolitan region
Clinical Coordination	Problem-solving capacity of PC	Established risk classification. Absence of municipal care protocols. Targeted active search for patients with hypertension who miss follow-ups. Collection of laboratory tests and performance of ECG in the units in only a few municipalities. Health education groups suspended due to the COVID-19 pandemic. Shortage of essential medicines. Impacts of the COVID-19 pandemic on the follow-up of users with chronic diseases.	Carrying out risk classification on a case-by-case basis. Lack of municipal care protocols. Active search for patients with hypertension who miss follow-ups. Centralized laboratory tests collection and electrocardiogram. Health education groups suspended due to COVID-19 pandemic. Sufficient essential medicines. Impacts of the COVID-19 pandemic on the follow-up of users with chronic diseases.
	Position of PC within the system and its capacity to resolve issues for hypertensive patients	Most used entry points in the occurrence of stroke: basic health units and urgent and emergency services. CHA as the professional responsible for identifying patients' hospitalization and their return to the territory. Post-stroke unit follow-up: home visits and offering medical consultations. Rehabilitation services primarily provided by physical therapy. Absence of home physical therapy, insufficient vacancies for care, and difficulties in ensuring transportation for users. Absence of support from the NASF. Low evaluation of PC as a care coordinator.	Most used entry points in the occurrence of stroke: basic health units and urgent and emergency services. Family member or CHA responsible for identifying the patients' hospitalization and their return to the territory. Post-stroke unit follow-up: home visits and offering medical consultations. Rehabilitation services offered by physical therapy, speech therapy, and nutrition. Physical therapists available in some basic health units, with centralized nutrition and speech therapy services, but with insufficient supply. No NASF. Low evaluation of PC as a care coordinator.

Administrative/ Organizational Coordination	Organization of pathways for specialized outpatient care	Lack of established flows. Insufficient vacancies in the AAE (primarily services under state responsibility). Participation in intermunicipal consortia. Presence of a municipal regulation center. Initial implementation of the decentralization of state regulation process (formative self-regulation).	Lack of established flows. Insufficient vacancies in the AAE for services under state responsibility. Easier access to the AAE via intermunicipal consortia. Presence of a municipal regulation center with easy communication through PC. Initial implementation of the decentralization of state regulation process (formative self-regulation).
	Integration between teams and services	Absence of joint activities or direct contact between professionals at different levels of care. Physical proximity between points of care as a facilitating factor in communication in small cities. Improved communication among PC professionals. Team meetings as a unique space in the communication process within PC itself, but it is not practiced in all settings and was interrupted in one municipality due to the COVID-19 pandemic. Most used communication mechanisms between levels of care: telephone (calls and WhatsApp) and reference and counter-reference guides. Difficulties with the availability and use of telephone devices. Absence of counter-referral to PC. Patient responsible for carrying out the counter-referral. Counter-referral as a practice originating only from the care unit from *Rede Cuidar*.	Absence of joint activities or direct contact between professionals at different levels of care. Physical proximity between points of care as a facilitating factor in communication in small cities. Improved communication among PC professionals. Team meetings as a unique space in the communication process within PC itself but not practiced in all settings and was interrupted in one municipality due to the COVID-19 pandemic. Most used mechanisms for communication between levels of care: reference and counter-reference guides. Absence of counter-referral to PC. Patient as responsible for carrying out the counter-referral. Counter-referral as a practice originating only in a hospital unit in one municipality in the region.
Information Coordination	Instruments for informational continuity	Availability of electronic health records (EHR). Lack of EHR interoperability. Problems with connectivity and availability of computers in the units. Concurrent use of EHR and physical medical records.	Absence of electronic health records in most health units and municipalities.

Source: table created by the authors.

DISCUSSION

This investigation identified a still fragile performance of PC in coordinating care for individuals with chronic diseases. The highlighted weaknesses span all coordination pillars (clinical, administrative/organizational, and informational) and are linked to challenges already noted in both national and international literature on healthcare networks, not limited to the care of individuals with chronic diseases. These challenges include the lack of municipal care protocols, difficulties in consolidating PC as the gateway to the network, the absence of established flows, integration challenges among professionals from different care points, and issues with the use of EHR[5,6,22-24].

This study also revealed that family health teams were more effective in coordinating horizontal care, with most obstacles related to vertical coordination. However, some efforts were made toward developing this attribute, such as risk classification, home visits, guaranteeing consultations at the UBS, health education groups, and the participation of municipalities in intermunicipal consortia to optimize access to the AAE.

Regarding clinical coordination in PC, the study identified weaknesses in the availability of ECGs and the dispensing of medications in health units. In the study by Bousquat et al.[5], a low frequency of these essential activities in the care of individuals with chronic diseases was also observed, emphasizing that the lack of adequate structural conditions is a significant barrier for PC in fulfilling its role in care coordination.

Participants related the guarantee of first-contact access in primary care to the provision of consultations, primarily by medical professionals, and mentioned the interference of political figures in the scheduling of these consultations as a hindering factor in maintaining universal and equitable access. Tesser et al[25] highlighted other issues that hinder users' timely access to PC services, such as the excessive number of individuals registered in health teams, the shortage of physicians, the turnover of professionals due to precarious employment arrangements, and the rigidity in scheduling appointments, which prioritize specific groups over others. Similar to this study, other research has shown weaknesses in the organization of care due to the absence or lack of recognition by professionals of care protocols, contributing, for example, to difficulties in the PC referral processes[6].

This study highlights the essential role of CHAs in the follow-up of individuals with chronic diseases through active searches and home visits, contributing significantly to horizontal coordination within PC. However, the role of CHAs in family health teams has faced various challenges since its inception, which were further exacerbated by the 2017 National Primary Care Policy (Política Nacional de Atenção Básica, PNAB). This policy introduced changes to team compositions with direct implications for CHAs' work. Despite these challenges, CHAs' efforts in monitoring health conditions have become fundamental to ensuring comprehensive and continuous care, particularly for individuals with chronic diseases.

Administrative/organizational coordination revealed that the lack of established flows within the healthcare network, insufficient vacancies for the AAE, and deficiencies in the referral and counter-referral

processes contribute to the fragility in the integration of network teams and services, thus compromising the continuity of care provided to users.

The instruments used for coordination between levels of care, though considered unsatisfactory, were classified as feedback tools[8], aimed at ensuring the exchange of information between care points for a shared and longitudinal care plan. These included both informal tools (such as telephone) and formal mechanisms (such as reference and counter-reference forms). Such means were also identified in other studies conducted in Brazil[6,28]. Notably, both the literature and this study highlight that physical proximity and familiarity among professionals - whether within the same service or across different care points - facilitate information exchange and case discussions, contributing to communication continuity [22,29,30].

This study, along with others, identified numerous obstacles regarding referrals and counter-referrals[6,22]. In a study by Aller et al[29], AAE physicians frequently rejected many referrals from PC, leading to delays in diagnoses and treatments due to the absence of clear referral flows and criteria. Meanwhile, PC physicians reported experiencing heavy workloads, which limited consultation time and hindered their ability to provide comprehensive referrals. Similarly, this study observed a lack of understanding and trust among AAE professionals regarding the role and scope of PC[24].

The lack of counter-referrals from outpatient and tertiary care, including hospital discharge plans following a stroke, directly impacts the continuity and quality of care. As a result, patients are often responsible for conveying information about the procedures performed by professionals at different levels of care[23].

Regarding referrals, participants mentioned the still incipient experience of decentralizing the regulation of state-managed services, where PC physicians request exams and specialty consultations through a computerized system. Some authors emphasize the importance of decentralizing regulation to strengthen PC as a coordinator of care, as it facilitates patients' access to specialized services, reduces waiting times, and increases the involvement of PC team professionals in monitoring the requested procedures[31,32]. However, a major challenge identified in both national and international studies, as well as by participants in this investigation, is the insufficient availability of slots for exams and specialized consultations, including physical therapy for post-stroke rehabilitation, which contributes to delays in diagnosis and appropriate treatment [6,22,24,32,33].

A strategy adopted by the municipalities in this study to facilitate patients' access to specialized consultations involves the Intermunicipal Health Consortia, which serve as instruments providing technical and financial cooperation between municipalities, particularly those that, like in this study, are geographically distant from large urban centers and face challenges in implementing the Brazilian Unified Health System (*Sistema Único de Saúde*, SUS). The cooperation between municipalities through the consortia contributes to better structuring of the healthcare network, as it considers the installed capacity of each locality, enabling the implementation of collective projects that would be unfeasible individually. In addition, it enhances state representativeness by politically strengthening regional areas[34-36].

Considering the coordination of information, some authors have suggested that the use of Information and Communication Technologies (ICTs), including EHRs, can facilitate the coordination of vertical care. This study found that the adoption of EHRs is not a reality in all municipalities, and those that have implemented them face challenges in their proper use, such as the lack of interoperability between points of care, which becomes an obstacle to informational continuity and directly impacts the development of care coordination[5,24,32].

The Health Care Planning process and the implementation of Rede Cuidar in the North health region have significantly impacted PC coordination for patients with chronic diseases. The implementation of *Rede Cuidar* in Espirito Santo, enabled by the Health Care Planning process and based on the Chronic Conditions Care Model, aimed to structurally transform work processes, particularly by enhancing PC's role in managing chronic diseases at this level of care. This transformation aimed to ensure better problem-solving, improve care flow establishment, and offer comprehensive care to users[13]. Some contributions of these processes pointed out by participants in the North region include the introduction of risk stratification for individuals with chronic diseases by PC professionals, the possibility of offering multi-professional care with easier referral processes and increased availability of vacancies for certain specialties and exams, and counter-referrals to PC to provide integrated and continuous care. A different reality was found in the Metropolitan region.

Finally, the study highlights the influence of the COVID-19 pandemic on the follow-up of individuals with chronic diseases, who are considered a high-risk group for complications[37]. Other studies point to the negative impacts of the pandemic on the management of patients with chronic diseases, especially those with multimorbidity, including difficulties in accessing medications and medical consultations[38].

CONCLUSION

Most obstacles identified in this investigation regarding the development of care coordination by PC relate to vertical coordination, demonstrating that PC cannot fully play its role without the articulation between levels of care. Achieving a strong PC capable of providing continuous and effective care requires adopting integration strategies between federative entities, expanding the supply of specialized care from a regional perspective, and increasing problem-solving capacity at the first level of care.

Finally, the gaps and insights revealed in this research suggest the need for scientific investigations focused on understanding the impacts of the COVID-19 pandemic on the care of individuals with chronic diseases.

This was the first study conducted in the state of Espirito Santo that provided an evaluation of the planning process in the state and the impacts of *Rede Cuidar* on the care of individuals with chronic diseases.

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AMP, APSCA: responsible for the conception, collection, and analysis of data and writing of the final text.

TDS: Responsible for the conception, analysis of the data, and review of the work.

LFF: responsible for reviewing the work.

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