

Primary health care in the face of post-COVID-19 syndrome: an integrative review

Atenção primária à saúde perante a síndrome pós-COVID-19: uma revisão integrativa

La atención primaria de salud frente al síndrome pos-COVID-19: una revisión integrativa

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Abstract

Introduction: Primary Health Care has played a fundamental role in the care of patients with post-COVID-19 syndrome. Post-COVID-19 syndrome is characterized as a syndrome that comprises the emergence of signs and symptoms after SARS-CoV-2 infection in the acute, ongoing, and post-infection phases. **Objective:** To understand the mechanisms developed to improve management in the comprehensive care of patients with post-COVID-19 syndrome in Primary Health Care, in dialogue with the Brazilian and German health systems. **Methods:** A theoretical and exploratory search was carried out in two databases (PubMed and Web of Science) on the management of post-COVID-19 syndrome, considering the challenges and potentialities of Primary Health Care in Brazil and Germany for the adequate management of patients with this condition. **Results:** Post-COVID-19 syndrome affects multiple organs and systems, requiring management based on multimodal and biopsychosocial models, considering both medical and non-medical therapeutic approaches. Although Primary Health Care coverage has improved in Brazil and Germany regarding the treatment of this syndrome, some challenges remain. **Conclusions:** Improving the management of post-COVID-19 syndrome within Primary Health Care requires a multifaceted approach. This involves advancing the professional understanding of the syndrome's complex and evolving pathophysiological mechanisms, establishing and regularly updating evidence-based clinical guidelines for managing persistent symptoms, and developing structured referral and counter-referral systems. Furthermore, healthcare professionals must be trained to assist in the early diagnosis and appropriate referral of patients with post-COVID-19 syndrome in Primary Health Care. These efforts must be adapted to local healthcare realities, emphasizing intersectoral collaboration and the integration of physical, psychological, and social dimensions in the provision of comprehensive care.

Keywords: Primary health care; Family practice; Post-acute COVID-19 syndrome.

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Resumo

Introdução: A atenção primária à saúde tem desempenhado papel fundamental no cuidado aos pacientes com a síndrome pós-COVID-19. A síndrome pós-COVID-19 é caracterizada como uma condição patológica que compreende o aparecimento de sinais e sintomas após a infecção pelo Sars-CoV-2, manifestando-se nas fases aguda, intermediária e a longo prazo. **Objetivo:** Compreender os mecanismos desenvolvidos pela atenção primária à saúde para melhorar a gestão no cuidado integral de pacientes com a síndrome pós-COVID-19, em diálogo com os sistemas de saúde brasileiro e alemão. **Métodos:** Foi realizada uma busca teórica e exploratória em duas bases de dados (PubMed e Web of Science) sobre o manejo da síndrome pós-COVID-19, considerando os desafios e as potencialidades da atenção primária no Brasil e na Alemanha, para manejar adequadamente os pacientes com essa condição. **Resultados:** A síndrome pós-COVID-19 afeta diferentes órgãos e sistemas, sendo necessário um manejo baseado em modelos multimodais e biopsicossociais, considerando formas terapêuticas médicas e não médicas. Apesar de a cobertura de saúde primária ter melhorado no Brasil e na Alemanha no quesito tratamento da referida síndrome, ainda é possível observar alguns desafios no seu manejo. **Conclusões:** Aprimorar o manejo da síndrome pós-COVID-19 na atenção primária à saúde requer uma abordagem multifacetada. Isso envolve o avanço da compreensão profissional dos mecanismos fisiopatológicos complexos e em evolução da síndrome, o estabelecimento e a atualização regular de diretrizes clínicas baseadas em evidências para o manejo de sintomas persistentes e o desenvolvimento de sistemas estruturados de referência e contrarreferência. Além disso, os profissionais da saúde devem receber formação para atuarem no diagnóstico precoce e no encaminhamento adequado dos pacientes com pós-COVID-19 na atenção primária à saúde. Esses esforços devem ser adaptados à realidade local de saúde, enfatizando a colaboração intersetorial e a integração das dimensões física, psicológica e social na prestação do cuidado integral.

Palavras-chave: Atenção primária à saúde; Medicina de família e comunidade; Síndrome de pós-COVID-19 aguda.

Resumen

Introducción: La Atención Primaria de Salud ha desempeñado un papel fundamental en la atención de pacientes con Síndrome Post COVID-19. El Síndrome Post COVID-19 se caracteriza por ser una condición patológica, que comprende la aparición de signos y síntomas después de la infección por SARS-CoV-2, manifestándose en las fases aguda, intermedia y larga. **Objetivo:** Comprender los mecanismos desarrollados por la Atención Primaria de Salud para mejorar la gestión en la atención integral de pacientes con Síndrome Post COVID-19, en diálogo con los sistemas de salud brasileño y alemán. **Métodos:** Se realizó una búsqueda teórica y exploratoria en dos bases de datos (PubMed y Web of Science) sobre el manejo del Síndrome Post COVID-19, considerando los desafíos y el potencial de la atención primaria en Brasil y Alemania para manejar adecuadamente a los pacientes con esta condición. **Resultados:** El Síndrome Post COVID-19 afecta a múltiples órganos y sistemas, requiriendo un manejo basado en modelos multimodales y biopsicosociales, considerando enfoques terapéuticos tanto médicos como no médicos. Si bien la cobertura de la atención primaria de salud ha mejorado en Brasil y Alemania con respecto al tratamiento de este síndrome, persisten algunos desafíos. **Conclusiones:** Mejorar el manejo del Síndrome Post COVID-19 en Atención Primaria requiere un enfoque multifacético. Esto implica profundizar la comprensión profesional de los complejos y cambiantes mecanismos fisiopatológicos del síndrome, establecer y actualizar periódicamente guías clínicas basadas en la evidencia para el manejo de los síntomas persistentes, y desarrollar sistemas estructurados de derivación y contraderivación. Además, es fundamental capacitar a los profesionales sanitarios para garantizar el diagnóstico precoz y la derivación adecuada de pacientes con Síndrome Post COVID-19 en la Atención Primaria de Salud. Estas iniciativas deben adaptarse a las realidades sanitarias locales, priorizando la colaboración intersectorial y la integración de las dimensiones física, psicológica y social en la prestación de una atención integral.

Palabras clave: Atención primaria de salud; Medicina familiar y comunitaria; Síndrome post agudo de COVID-19.

INTRODUCTION

In most countries, Primary Health Care (PHC) is considered the gateway to the health system. It is known that PHC has been affected by the pandemic caused by SARS-COV-2 and that the pandemic left marks on health systems, exacerbating already existing problems.¹

Many researchers have focused on secondary and tertiary care of patients who have been hospitalized for COVID-19, and some authors have shown that PHC centers play an essential role in following up and monitoring patients who have post-infection signs and symptoms.²⁻⁴ Post-COVID-19 syndrome (or long COVID) is characterized as a pathological condition that comprises the presence of symptoms after SARS-CoV-2 infection, manifesting in the acute, ongoing, and post-infection phases.⁵

It is noteworthy that some strategies have been developed to facilitate the management of patients with the syndrome in PHC; however, these strategies seem to be decentralized. From this perspective, our

objective with this integrative review was to understand the mechanisms developed by PHC to improve management in the comprehensive care of these patients, in dialogue with the Brazilian and German health systems. The intention was not to make a comparative analysis between the two countries, but rather to identify challenges and potentialities present in the two PHC systems, in a process of establishing reflective dialogues.

METHODS

This integrative review^{6,7} allowed the understanding of some mechanisms developed in the management of comprehensive care to patients with post-COVID-19 syndrome in Brazil and Germany.

For the formulation of the research question — how to improve referral and management of patients with post-COVID-19 syndrome in PHC in Brazil and Germany, considering referral and counter-referral —, we used the ECLIPSE framework, in which “E” refers to expectation (what is the research objective); “C” refers to client group (who are the users, patients, or target population); “L,” location of the service (where the study takes place — country, health center, region); “I,” impact (which changes or improvements are being sought after or evaluated); “P,” professionals (which professionals are directly related to the issue); and, lastly, “SE,” referring to service (which healthcare service is being investigated or analyzed).

The search, performed in 2022, was updated, considering articles published from 2022 to June 2025 (PubMed and Web of Science databases) for analysis. The following keyword combinations were used: (Long COVID-19 Syndrome OR Post-COVID-19 Syndrome) AND (Primary Health Care OR Care, Primary Health OR Health Care, Primary OR Primary Healthcare OR Healthcare, Primary OR Primary Care OR Care, Primary), in English and Brazilian Portuguese.

Selection criteria

Scientific articles classified as integrative, systematic, and scoping literature reviews, whose authors directly addressed the research question, were included. Literature review studies were chosen because they synthesize evidence in a structured and critical way, ensuring greater methodological rigor and relevance to the research question.

Exclusion criteria consisted of other study designs not previously mentioned (randomized controlled studies, meta-analyses, etc.) and any articles that did not make the methods clearly available or were not available online.

Official documents and governmental ordinances related to the organization and structuring of PHC systems in Brazil and Germany dealing with long COVID were included as support material.

Two authors selected the articles for analysis.

Data extraction and analysis

To ensure transparency in the selection and analysis of results, the broad concept of strength of evidence was adopted.⁸ This concept reflects the basic quality or scientific credibility of studies at levels of evidence:

- I. meta-analysis;
- II. individual experimental studies, systematic reviews;

- III. quasi-experimental studies;
- IV. comparative, descriptive, and qualitative research;
- V. evaluation of program or use of bibliographic research and scope;
- VI. expert opinions, including the interpretation of information not based on research.

Although this integrative review focused on levels of evidence II, V, and VI, it allowed a broad analysis of studies relevant to the management of post-COVID-19 syndrome in PHC.

For the analysis and synthesis of articles, a table was created in Microsoft Office Word. This table included the following variables: title of the article, authors, journal, study design/approach, research objective/question, results, and levels of evidence. This integrative review did not require approval from the Research Ethics Committee.

RESULTS AND DISCUSSION

We found a total of 192 articles, of which 13 were selected based on the inclusion criteria (Figure 1). Three Brazilian official documents⁹⁻¹¹ and one German document were added; all dealing with long COVID.¹²

Post-COVID-19 syndrome: from diagnosis to treatment

Epidemiologically, according to the literature, post-COVID-19 syndrome affects approximately 10–35% of the population infected with SARS-CoV-2. In patients who have been hospitalized with severe symptoms, this incidence can reach 85%.¹³ Nevertheless, it has been difficult to find exact numbers of affected patients due to some gaps in monitoring.¹³⁻¹⁵

There is a broad consensus in the scientific literature on the definition of the syndrome.¹⁶⁻¹⁸ According to the guidelines developed by the National Institute for Health and Care Excellence,¹² post-COVID-19 syndrome is a term that covers three clinical phases of the disease:

- Acute COVID-19: Refers to signs and symptoms that persist for up to four weeks after SARS-CoV-2 infection;
- Ongoing symptomatic COVID-19: Characterized by the persistence of clinical manifestations four to 12 weeks after infection;
- Post-COVID-19 syndrome: Includes signs and symptoms that persist for more than 12 weeks and are not explained by an alternative diagnosis.

Brazil has advanced in the formulation of technical guidelines aimed at the clinical management and rehabilitation of people with long COVID within the scope of the Brazilian Unified Health System (SUS). The Brazilian Ministry of Health has published strategic documents focusing on the reorganization of primary healthcare services, aiming at continuous monitoring and multiprofessional performance in the face of persistent symptoms of the syndrome. For instance, Recommendation No. 013/2022 provides specific guidance on the management and follow-up of patients with prolonged clinical conditions of the disease.⁹ In turn, Technical Note No. 57/2023 presents updates on the national scenario and highlights the importance of comprehensive health care for these patients.¹⁰ More recently, the document *Orientações sobre diagnóstico e tratamento de pacientes com as condições pós-COVID* [“Guidelines on the diagnosis

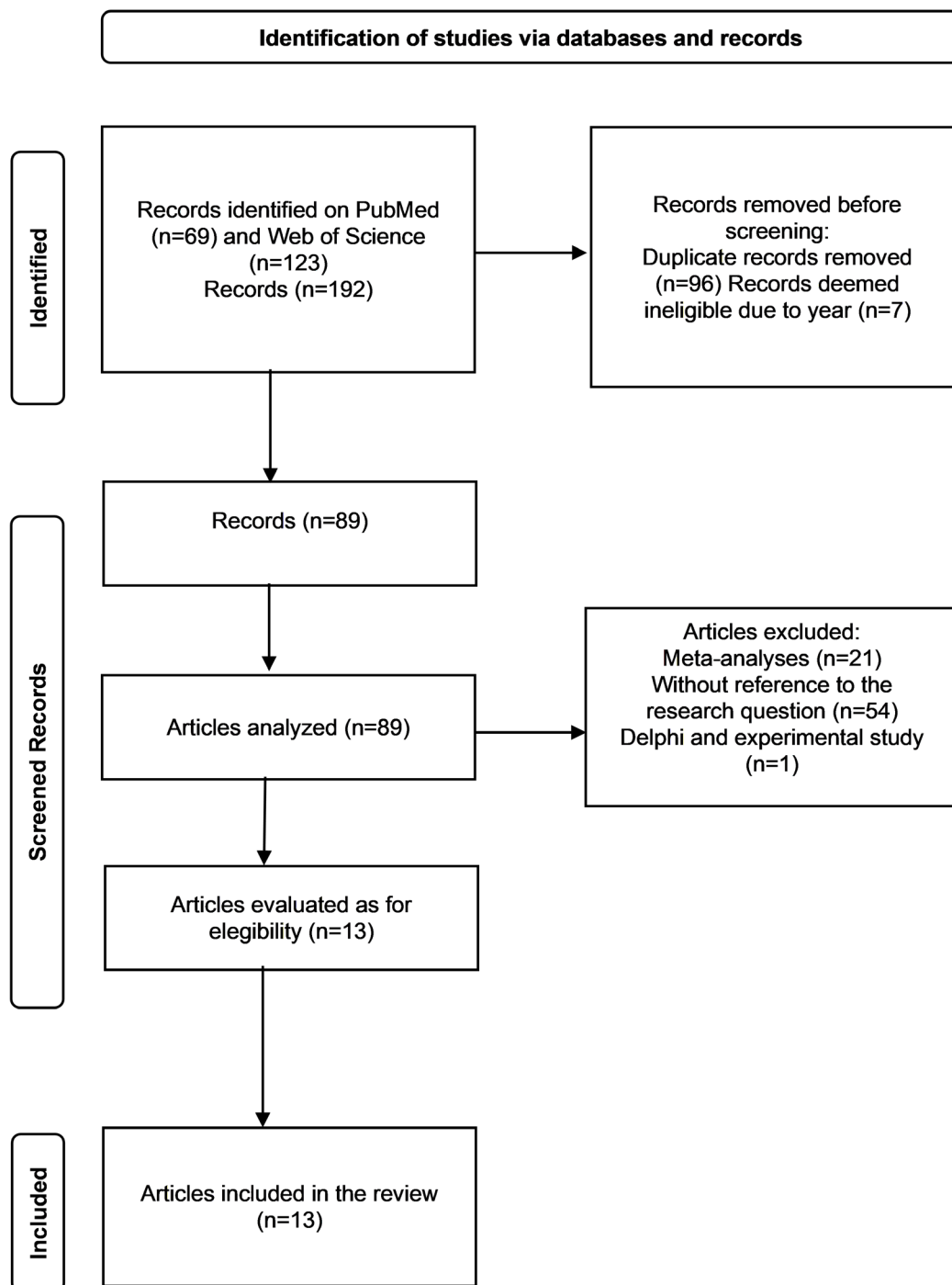


Figure 1. Flowchart of search and selection of articles.

and treatment of patients with long COVID”]¹¹ provides technical support for the early recognition of clinical manifestations and the appropriate referral to specialized services, reinforcing the approach focused on comprehensive care.

The S1-Leitlinie-Long-/Post-COVID clinical manual, published in May 2024 by the Association of Scientific Medical Societies in Germany,¹³ provides information on the clinical management of the syndrome within the German health context, standardized definitions, diagnostic criteria, and therapeutic recommendations for patients with persistent symptoms. This manual addresses the complex and multisystemic nature of

the disease, representing an important step in formalizing the treatment of post-COVID-19 syndrome in Germany and contributing to the broad international effort in the clinical approach to this condition.

In the International Classification of Diseases, a specific code (U09.9) was introduced for the diagnosis of the syndrome.¹⁹ This introduction facilitated the standardization of reports and disease surveillance. Among the systems commonly affected are respiratory, cardiovascular, renal, hepatic, musculoskeletal, integumentary, and nervous, reaffirming the complex and heterogeneous nature of the syndrome.²⁰

The main signs and symptoms observed in patients are: headaches, abdominal pain, hoarseness, myalgia, depression, sleep disorders, difficulty concentrating, arthralgia, loss of taste, and skin lesions.²⁰ It is worth highlighting that the pathophysiological processes related to the syndrome are not yet well known; however, some questionnaires were used to facilitate early diagnosis (EQ-5D, Short-Form-36, Post-COVID-19 Functional Status Scale, Newcastle Post-COVID Syndrome Follow Up Screening Questionnaire, COVID-19 Yorkshire Rehabilitation Screening, Hospital Anxiety and Depression Scale).¹⁸

Given the complexity for diagnosing the syndrome, patient management should adopt a multimodal and biopsychosocial approach that integrates some dimensions:

- physical health, covering persistent somatic symptoms;
- mental health and cognitive function, considering neuropsychiatric sequelae;
- family and social well-being, recognizing psychosocial impacts.

In Table 1, we present an overview of the articles included in this review. The main findings will be subsequently discussed in detail.

Based on the findings, it can be inferred that the studies show convergence regarding the clinical complexity and the multidimensionality of persistent symptoms as well as the need for integrated approaches in PHC.

Wolf et al.¹⁸ highlight the importance of coordination between different levels of care, indicating that patients with post-COVID-19 syndrome should be referred according to their specific needs to community and specialized care networks, thus reinforcing the central role of the family doctor in the continuous follow-up of these patients. van Kessel et al.¹⁷ claim that the impact of COVID-19 extends beyond physical manifestations. Likewise, Esposito et al.¹⁶ highlight the scarcity of data on pediatric populations, emphasizing the need for research to guide the clinical practice of pediatricians.

Despite the advances in coping with the syndrome, significant gaps persist, especially related to the understanding of the natural history of the condition and the absence of standardized protocols for its follow-up in PHC. Among the main practical challenges are the need for continuous training of health professionals in PHC,^{22,24} the implementation of integrated and multidisciplinary care models,^{21,28} and the lack of studies aimed at specific populations such as older adults or patients with cognitive impairments.^{29,30}

Brazil and Germany in focus: challenges and innovations in Primary Health Care

We verified structural and organizational similarities and differences between health systems in Brazil and Germany in the documents and ordinances incorporated into this review. While the Brazilian SUS is free and universal and medical care is at one's own discretion for private initiatives, the German health system is mandatory, agreed by the coexistence of legal health insurance (coverage of approximately 90%) and substitute private health insurance (10%),¹³ which together provide universal health coverage for people in the German territory.

Table 1. Description of articles available for analysis.

Author/year	Objective	Study design	Main results/level of evidence
Esposito et al., 2022 ¹⁶	To consolidate the consensus on post-COVID-19 in children, focusing on diagnosis and clinical management.	Literature review with consensus	Evaluation of symptoms between four and 12 weeks after the acute phase is recommended. Emphasis on pediatric guidelines. Level VI.
van Kessel et al., 2022 ¹⁷	To synthesize persistent symptoms in patients with mild COVID-19.	Systematic review	Fatigue is the most common symptom. Cognitive and psychological functions can also be affected. Level II.
Wolf et al., 2022 ¹⁸	To present care models and recommendations for clinical decisions and referral in post-COVID-19.	Scoping review	The authors suggest referral network according to symptoms: Primary Health Care, specialists, or specialized clinics. Level V.
Barshikar et al., 2023 ²¹	To describe integrated care models for patients with post-COVID-19.	Literature review	The authors highlight the importance of integrated and multidisciplinary approaches involving primary care, specialized care, and rehabilitation services. Levels V/VI.
Brennan et al., 2022 ²²	To identify strategies to improve post-COVID-19 management in Primary Health Care.	Scoping review	The authors suggest training of general practitioners, clear guidelines, and better intersectoral communication. Level V.
Chou, 2024 ²³	To investigate existing post-COVID-19 definitions and care models.	Scoping review	The author identifies absence of consensus on definition and describes patient-centered models. Level V.
Curvelo et al., 2024 ²⁴	To review how the Brazilian health system has dealt with post-COVID-19.	Scoping review	The authors point out challenges in Primary Health Care and suggest creating specific lines of care. Level V.
Dillen et al., 2023 ²⁵	To evaluate the effectiveness of rehabilitation interventions in the outpatient clinic for persistent symptoms post-COVID-19.	Systematic review	Outpatient rehabilitation has moderate positive effects on fatigue and functional capacity. Level II.
Herman et al., 2022 ²⁶	To provide a quick review of post-COVID-19 evidence.	Literature review with consensus	Most common symptoms: fatigue, cognitive and respiratory dysfunctions; there are gaps in management and referral. Level VI.
Katz, 2022 ²⁷	To understand the impacts of the post-COVID-19 condition on health systems.	Literature review with consensus	The burden on the health system is increasing. The lack of standardization in the diagnosis impairs longitudinal care. Level VI.
Li et al., 2022 ²⁸	To review pathophysiological mechanisms, long-term outcomes, and multidisciplinary management strategies.	Literature review	The authors suggest multidisciplinary teams and stratified care. Fatigue and neuropsychiatric symptoms are the most prevalent. Level V.
Mansell, 2023 ²⁹	To address post-COVID-19 in older adults.	Literature review	The authors highlight the high risk of functional and cognitive complications. They propose comprehensive geriatric evaluation. Level V.
Zifko et al., 2022 ³⁰	To provide recommendations for management of cognitive deficit associated with post-COVID-19 in Primary Health Care.	Systematic review	The authors propose standardized screening, cognitive rehabilitation, and referrals according to severity. Level II.

In Germany, the cost of health insurance is partially offset by a system financed by premiums paid by workers and employers. Unlike models focused on private insurers, this system also guarantees coverage for children, older adults, refugees, and unemployed individuals.

Some guiding principles and guidelines of the SUS seem to dialogue with the principles of the German health system. For example, universality, which guarantees all Brazilian citizens the right to “access to health services at all levels of care,” and equality, which ensures “health care, without prejudice or privileges of any kind,” is similar to the German principle of solidarity, that is, “all insured persons have the same right to medical care and to the continuous payment of wage when sick, regardless of their income.” These principles guarantee access to health as a right, without distinction of race, social condition, or ethnicity.

PHC in Brazil is mainly composed of the teams: Family Health Strategy; community health agents; oral health; support centers; and special modalities. In Germany, PHC is the competence of outpatient clinics (general practitioners, family doctors).¹² We observed a significant difference in the minimum professional composition of PHC centers in Brazil and Germany. In Brazil, we verified that this composition is multiprofessional (physicians, nurses, nursing technicians, physical therapists, psychologists, dentists, community health agents, etc.). In Germany, the minimum composition of PHC consists only of family doctors and/or general practitioners and nurses, with the other professionals being concentrated on secondary and tertiary care levels.

The two health systems have potentialities such as the coexistence of principles and guidelines that guarantee universal health and the rights of the population. However, although health coverage seems to have grown in the last decades in both countries, it is still possible to observe challenges. In Brazil, these challenges are related to structural issues and regional disparities in access to health services,³¹ while the provision of fragmented services and the difficult digitalization of health information systems seem to be some of the main challenges faced by Germany.¹²

Investments in PHC are deemed scarce in both countries. This hinders the development of health promotion and disease prevention actions that require greater investment and, especially, national assessments.^{12,31}

The PHC evaluation strategies consisted in an important finding, such as the Program for Improving Access and Quality of Primary Health Care in Brazil and the Institute for Quality Assurance and Transparency in Health in Germany, assisting in transparency, management, and allocation of financial resources for PHC.

By analyzing PHC in Brazil and Germany, we verified convergences, particularly in its commitment to health coverage and equitable access. Both countries maintain constitutional frameworks that recognize health as a fundamental right. Underfunding PHC, fragmented care networks, and low-paid professionals continue to hinder the comprehensive care of patients. In this sense, strengthening the integration of sectors, better wages, and vocational training strategies are essential to ensure the comprehensive care of patients.

Primary Health Care in the management of post-COVID-19 syndrome

Barshikar et al.²¹ propose a staggered model, divided into two levels of care: level 1, centered on the initial management performed by PHC, with screening and monitoring of symptoms; and level 2, aimed at evaluation and referral to specialized services, according to the complexity of the case. The aim of the

model is to overcome geographical and socioeconomic barriers by establishing local and accessible care, with a fluid transition to specialized levels, via referral and counter-referral, using telemedicine. These findings corroborate other studies whose authors recommend the use of telemedicine to extend the reach of PHC in populations geographically difficult to access.²³

PHC plays an extraordinary role in the referral of patients with the syndrome, and professionals are crucial in the evaluation and follow-up of these patients.^{23,24} In addition, there is a need to formulate standardized tools in PHC that grasp the complexity of the signs and symptoms presented by patients.²¹⁻²⁴

It is worth highlighting that the multiprofessional composition in PHC, the ongoing training of professionals, and the elaboration of strategies that articulate the sectors seem to be key for the effective management in PHC.

The flow of care provision for patients with long COVID in Brazil and Germany presents specific pros and cons. If, on the one hand, there is a strong territorial presence of family doctors and a multidisciplinary team close to the community in Brazil, on the other hand, the lack of material resources, limited training of professionals to tackle the syndrome, and difficulty of access to tests, specialized medical services, and rehabilitation centers are the main challenges faced by PHC. In Germany, the clinical and administrative autonomy of general practitioners, the robust guidelines for patients' diagnosis and follow-up, and the ease of access to specialized centers are considered strengths. Conversely, the poor relationship between teams and the community, especially the most vulnerable, and the high cost of services negatively reflect on person-centered care in the German territory.

The differences observed between PHC services in Brazil and Germany reinforce the importance of considering territorial specificities in the development of referral and counter-referral strategies. PHC is the main gateway for patients with post-COVID-19 syndrome, and it is essential that health professionals are adequately trained and receive the necessary support to carry out a continuous follow-up of these patients.

It is worth mentioning that some models and flows have been developed to ensure the proper referral of these patients, but it is necessary to give voice to professionals who are on the PHC front line, for a more detailed understanding of successful management strategies, mechanisms, and experiences.

Some advances are observed, especially in relation to the survey of epidemiological data. These data have assisted in targeting syndrome management strategies; nonetheless, standardized instruments and computational data capture techniques are necessary to assist in health management.³²

PHC continues to operate under financial constraints, with limited budget resources.¹ Consequently, digital transformation must be accompanied by training initiatives based on the principles of PHC to ensure that technology actually supports integrated care provision rather than just digitizing the existing workflows.^{12,18,21} In addition, there is evidence that although general practitioners recognize the potential of digital health applications to improve adherence, patients' mobility and health education are key.^{12,33}

A limitation of our integrative review is the scarce literature published, which may have excluded valuable insights derived from the empirical experiences of PHC professionals. Narrative studies exploring these perspectives remain scarce and underreported in the academic literature, thus limiting the depth of understanding and hindering the ability to extract more conclusive interpretations about the practical management of the syndrome. Moreover, as the study is an integrative review, the absence of systematic methodological rigor may have restricted the range of article selection. The predominance of literature review studies in our sample allowed a wide range of perspectives and conceptual interpretations of existing flows and models in PHC, but the inclusion of detailed studies on the experiences of PHC professionals from both countries would have enriched our analysis and deepened the transnational perspective.

CONCLUSION

The consequences of post-COVID-19 syndrome will likely persist as a complex and multifaceted condition, presenting ongoing challenges for health systems throughout world. Meeting former and emerging needs of PHC remains essential. The development and optimization of referral and counter-referral flows are equally important. Although existing care models and flows provide a foundation, they require greater refinement and adaptation to the context. This process should be based on the practical knowledge and experiences of health professionals working on the front line. Future research, particularly qualitative studies conducted in PHC, is essential for the propagation and dissemination of successful and context-sensitive management experiences.

CONFLICT OF INTERESTS

Nothing to declare.

AUTHOR'S CONTRIBUTIONS

SAH: Conceptualization, Data Curation, Formal Analysis. MMV: Conceptualization, Data Curation, Formal Analysis, Writing – review & editing. MGLH: Conceptualization, Data Curation, Formal Analysis, Writing – review & editing.

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