Health care network model for older adults: a co-creation and participatory action research approach

Modelo assistencial à saúde do idoso em rede: uma abordagem de cocriação e pesquisa-ação participativa

Diana Oliveira Noronha a,b, Cleber Luz-Santos b, Helena Pataro de Oliveira Novais c, Mônica Hupsel Frank d, Camila Marinho Costa d, Janine Cardoso Soub e, Renata Muniz Caire d, Josecy Maria de Souza Peixoto e, Kionna Oliveira Bernardes Santos b, José Garcia Vivas Miranda b

Abstract

Objective: To develop a collaborative, multidisciplinary care model for older adults that improves interdisciplinary teamwork and increases access to specialized services for frail patients, helping solve management problems in the Brazilian Unified Health System. In the state of Bahia, the health care network for older adults requires better interaction and integration with the Unified Health System and the Unified System of Social Assistance to improve patient flow in the network.

Methods: We used a co-creation and participatory action research approach based on reflection, data collection, interaction, and feedback with participants and stakeholders. Data was collected from health professionals, representatives of health agencies, and older adults through collective and individual interviews, reflective diaries, and direct communication.

Results: An action plan involving members of the older adult care network was developed to put the new model into practice. A pilot study with a multidisciplinary team allowed adjustments and implementation of the model at our institution.

Conclusions: The new model improved both the internal management of the State Reference Center for Older Adult Health Care (Centro de Referência Estadual de Atenção à Saúde do Idoso - CREASI) and its interaction with primary care, optimizing patient flow and establishing rules for shared management between CREASI and primary care institutions. In view of this, restructuring the care model reorganized relations between the agencies, expanding CREASI's role in the management and systematization of older adult health.

Keywords: population health management; geriatric health services; comprehensive health care.

Resumo

Objetivo: Desenvolver um modelo assistencial colaborativo, multiprofissional e centrado na pessoa idosa para melhorar o trabalho em equipe interdisciplinar e o acesso de idosos frágeis ao serviço especializado, ajudando na resolução de problemas com o gerenciamento do idoso no Sistema Único de Saúde (SUS). A rede de assistência à saúde do idoso na Bahia requer avanços na interação e na integração entre os órgãos do SUS e do Sistema Único de Assistência Social para melhorar o fluxo dos pacientes na rede.

Metodologia: Foi realizada uma pesquisa-ação participativa e cocriação baseadas na reflexão, coleta de dados, interação e feedback com participantes e partes interessadas. A coleta dos dados foi realizada com os profissionais de saúde, representantes dos órgãos de saúde e idosos por meio de entrevistas coletivas e individuais, diários reflexivos e registros de comunicação direta.

Resultados: Foi elaborado um plano de ação com participação dos membros da rede de assistência ao idoso para colocar em prática o novo modelo. Realizou-se um piloto com uma equipe multidisciplinar que possibilitou ajustes e a implementação do modelo na instituição.

Conclusões: O novo modelo favoreceu tanto o gerenciamento interno do Centro de Referência Estadual de Atenção à Saúde do Idoso (CREASI) como a interação com a atenção básica, otimizando o fluxo de pacientes e estabelecendo regras de gerenciamento compartilhadas entre CREASI e atenção básica. Diante disso, a reestruturação do modelo assistencial representou uma reorganização das relações entre os órgãos, ampliando o papel do CREASI no gerenciamento e na sistematização da saúde do idoso.

Palavras-chave: gestão da saúde da população; serviços de saúde para idosos; assistência integral à saúde.

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INTRODUCTION

The Brazilian Unified Health System recommends joint action between primary care (PC) and other levels of health care for older adults. The Comprehensive Older Adult Health Care guidelines established parameters for forming health care networks for older adults (HCNOA). These networks include sectors, agencies, and entities linked to the health and social assistance systems (Figure 1).

The State Reference Center for Older Adult Health Care (Centro de Referência Estadual de Atenção à Saúde do Idoso - CREASI) is the only institution in the HCNOA with human resources and infrastructure designated exclusively for older adults. CREASI devised a model for older adult care based on functionality, prioritizing cases of medium/high complexity in shared management with primary care. The operational flow between the different points of the HCNOA should be discussed and agreed upon to achieve effective adaptation to the political and social circumstances. In this context, CREASI, an agency of the Bahia State Health Department in Salvador created a working group for operational adjustments to prioritize specialized care for frail older adults. The restructuring of the care model was recognized by the Ministry of Health as an innovative and it was recommended by the Oswaldo Cruz Foundation as good practice for older adult health.

The new care model strengthened shared management and matrix support for primary care. Matrix support is specialized support for the questions and clinical decisions of professionals in the basic network. The new model established a formal link between CREASI and PC based on the clinical-functional stratification criteria of Moraes et al. to identify robust, pre-frail, and frail older adults. The operational adjustments were carried out by the CREASI working group through a collaborative action of co-creation and participatory action research. Similar processes have been used in Australia to develop models for older adults with dementia, in addition to pharmaceutical assistance for home nursing services.

Operational flow was modified, and awareness actions were needed to encourage professional engagement and participation. The objective of the study was to develop a collaborative and multidisciplinary care model for older adults, focusing on improving teamwork and access to specialized services for frail and pre-frail older adults, helping solve management problems in the Unified Health System.
METHODS

General study design
The new model of comprehensive health care for older adults was conceived by the working group and developed between 2013 and 2015. Participatory action research and co-creation was carried out with representatives from the District Attorney’s Office, Specialized Police Services for Older Adults, the State Council for Older Adults, the Unified Health System, and the Unified Social Assistance System (Sistema Único de Assistência Social). These services were called stakeholders and were considered key elements in the co-creation process. Reflection, interaction with participants, and feedback were used during the interviews to adjust the new model to the demands of CREASI and the stakeholders. Collaborative construction enabled the development of an action plan that led to the pilot intervention project. This study was conducted in accordance with the ethical principles of Ministry of Health resolution 510/2016, which regulates qualitative research in Brazil. Schoenberg et al.’s guidelines for qualitative studies were incorporated into the methodology. The timeline of the involved steps is shown in Figure 2.

Theoretical basis for developing the model
The new care model was inspired by the Geriatrics and Gerontology Center of the Federal University of Minas Gerais. Working group members visited this center to obtain technical information, which culminated in an assistance model based on older adult functionality. The center developed and

FIGURE 2. Timeline of steps taken in the co-creation process and participatory action research for the new health care network model for older adults.
validated the Clinical-Functional Vulnerability Index-20 (IVCF-20) which furthered the system’s ability to keep track of frail older adults. The Multidimensional Assessment of Older Adults (MAOA), which investigates medical conditions, functional status, social functioning, and mental health, was administered to frail and pre-frail older adults.

The center’s successful experience, combined with Unified Health System principles (universality, integrity, equity, community participation, political-administrative decentralization, hierarchization, and regionalization) and the Chronic Care Model proposed by Wagner and further developed by Epping-Jordan et al., formed the theoretical basis for the new care model. Specific legislation on the state health care network for older adults guided all stages of this model.

Meetings with stakeholders in the new care model
Between June and December 2013, the CREASI working group carried out a series of prospective actions to verify the perceived need to change the model and the level of engagement of the institutions of the HCNOA. As described in the general study design, these bodies were called stakeholders. Stakeholder managers and professionals were invited to two evaluation seminars promoted by CREASI. At these events, the preliminary version of the new assistance model was presented to the largest possible number of stakeholders. Participants were encouraged to reflect and record which adjustments were needed to address the specific demands of all involved parties. Two seminars were also held to present the preliminary version to CREASI professionals in order to list the critical nodes related to clinical care and matrix support. During the participatory action research period, both stakeholders and other CREASI assistance professionals were revisited for new contributions, to answer questions, and to give their opinions about the adjustments to be implemented.

Participants
After stakeholder engagement, two sample groups were formed, one composed of stakeholder representatives and the other by CREASI professionals. These groups were formed to verify theoretical saturation according to the methodology proposed by Fontanella et al. In the first group, the focus was discussing and seeking solutions for obstacles to the flow of older adults in the HCNOA. Group selection followed recommendations for a non-probabilistic sample according to the intentionality criterion. Contributions were absorbed by the CREASI working group, and the content volume was determined by saturation, i.e., the point at which sufficient information was obtained from the field of study, either through redundancy or repetition.

The second group consisted exclusively of CREASI professionals, and its purpose was to discuss the internal adjustments related to the new care model. All research subjects were invited to participate to ensure awareness and mobilization regarding the proposed action. For this reason, the meetings were organized in small focus groups that discussed the critical nodes of clinical care and matrix support with the help of a moderator, who was also member of the working group.

The CREASI working group consisted of an occupational therapist (clinical experience), two physical therapists (clinical and academic experience), two doctors (clinical and academic experience), a nurse (clinical and academic experience), an administrator (health service management) and a psychologist (clinical experience).

Data collection and analysis
Different strategies were used in the sample groups to capture data related to the co-creation, development and refinement of the new care model:

Collective or individual interviews
The interviews were conducted in air-conditioned rooms with no interference from outside noise, recorded by the moderator through notes and recordings. Working group meetings with stakeholder representatives, interviews with doctors, nurses, nursing technicians, and PC managers from Salvador, Bahia and the Bahia State Health Department, as well as focus groups with CREASI professionals were held in the presence of the moderator.

Reflective diaries
Notes from clinical meetings about the perceptions of older adults and caregivers regarding the functioning of CREASI and therapeutic assistance in HCNOA agencies were also recorded, serving as a basis for reflective diaries to document experiences and observations after each individual interview.

Direct communication records
Records of working group meetings (agendas and minutes) were systematized and collected (n = 29 records). E-mail records among working group members were also collected as a means of providing quick feedback and problem solving during implementation of the model.

During the meetings, the clinical records of patients were presented to stimulate discussion about the new model. The data collected from these sources were used to identify problems. To do this, the working groups compiled the records, systematizing them chronologically. Excerpts or data that could identify the participants were deleted, ensuring the data’s
anonymity and confidentiality. To reduce the risk of analysis bias, the data were systematized and filed by two members of the working group experienced in handling qualitative data.

RESULTS
In March 2014, after analyzing and interpreting the data, two documents were prepared, the first being a proposal to restructure the comprehensive health care assistance model for older adults and the second being an action plan to implement the model. These documents supported a pilot intervention for the new HCNOA model.

The new comprehensive health care network model for older adults
The new model established clear criteria for managing the health of older adults in two dimensions:

1. Management and matrix support of HCNOA
2. Internal management of CREASI.

Adjustments in HCNOA management have improved the relationship between CREASI and Basic Health Units and/or the Family Health Program. Shared management between CREASI and PC was established through the creation of a reference form that will be filled out exclusively by the doctor or nurse at Basic Health Units or the Family Health Program. The reference form standardized the criteria for access to CREASI and established clinical and functional parameters for identifying pre-frail or frail patients. The most vulnerable older adults were provided easy access to CREASI, while their more robust colleagues will be referred to their Basic Health Unit or Family Health Program with recommendations and guidance from a specialized team. Longitudinal follow-up for vulnerable older adults will be shared between CREASI and PC. The Integrated Care Plan (ICP), the instrument developed for shared health management of older adults, contains clinical suspicions, therapeutic goals, the drug plan, and the non-drug plan. The ICP became the central document of therapeutic conduct for older adults. It is printed in three copies, one for CREASI, one for the patient, and the last for the PC professional, which facilitates case monitoring.

CREASI’s internal management has undergone significant adjustments to adapt to the new assistance model. During the transition phase between care models, it was necessary to suspend admission of new patients to CREASI for eight months so that patients and staff could adapt to the new routines. Initially, six mini-teams were formed, consisting of a geriatrician, a nurse, physical therapist, and a social worker, who were responsible for monitoring and planning discharges from CREASI for exclusive PC monitoring. The mini-team applied the Multidimensional Assessment of Older Adults (MAOA) and held a multidisciplinary case discussion (MCD), which resulted in the ICP. The model also provided for periodic review of the MAOA and MCD to produce new referrals based on the patient’s functional improvement. Since this model requires longitudinal follow-up, the mini-team’s nurse was responsible for case management. Case management involved monitoring internal and external referrals to CREASI, in addition to rescheduling follow-up for the mini-team and the extended team. Shared management between CREASI and PC established standardized operational flows and helped restructure the process of admitting new older patients to CREASI (Figure 3).

Components of the new care model
The new assistance model has four fundamental components:

1. MAOA: an instrument used by geriatricians and gerontologists, has been recommended by the National Health Policy for Older Adults. It enables global assessment of older adults and guides the ICP. MAOA is an extensive procedure that is performed by a multi-professional team. It can be applied in specific modules in offices designed for this purpose at CREASI.

2. ICP: this document, prepared jointly by the members of the mini-team, includes clinical suspicions, therapeutic goals, medication and non-medication treatment plans, and internal and external referrals to CREASI. This is a key document in the shared monitoring of older adults.

3. MCD: therapeutic goals are discussed at this meeting by members of the mini-team. It is held immediately after application of the MAOA to exchange ideas and opinions about problems and possible solutions.

4. Case management: a critical factor in older adult health, having a recognized role in the quality of gerontological services. It is performed by the mini-team nurse, identifying older adults who need more intensive monitoring.

Action plan
The action plan was the strategy for facing the main obstacles the stakeholders identified to implementing the new model. The obstacles were grouped into strategic lines of action according to common objectives (Table 1). The action plan for the new assistance model was initially implemented in a CREASI mini-team in conjunction with PC units in the health districts of Itapagipe and Boca do Rio in Salvador,
FIGURE 3. Operational flowchart of the new care model for managing older adults between primary care and State Reference Center for Older Adult Health Care, as well as internal processes involving the mini-team (nurse, physical therapist, and geriatrician) and its main actions, such as comprehensive geriatric assessment, multidisciplinary case discussion, case management, and the integrated care plan.

Bahia. This stage was considered the pilot program for the new care model. The health teams of the Basic Health Units, Family Health Program, and the Psychosocial Care Center (a local mental health clinic) were trained in the new care model. Over four months, 23 older patients were admitted, of whom 60.8% (14) were considered frail and received shared management between CREASI and PC.

Stakeholder feedback was monitored during the pilot project, showing good acceptability and identifying gaps in the process, which needed to be reviewed between CREASI and PC. The doctors and nurses of the health teams reported that filling out the reference form took more time than usual for referrals to CREASI. They reported that one scale in the reference form, the Analog Classification Clinical-functional Frailty in Older Adults (Classificação Analógica de Fragilidade Clínico-functional dos Idosos), required prior knowledge of the IVCF-20, but it was considered a positive parameter in the therapeutic decision-making process.
TABLE 1. Main barriers to health management for older adults that affect the professionals of the State Reference Center for Older Adult Health Care (CREASI) and the managers/professionals of stakeholders, grouped according to strategic axis and objective.

<table>
<thead>
<tr>
<th>Barriers identified by stakeholders</th>
<th>Strategic axis of action</th>
<th>Goal</th>
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<tbody>
<tr>
<td>1. Disorganization and inactivity of HCNOA.</td>
<td>Network integration</td>
<td>Improve integration between HCNOA agencies in Bahia</td>
</tr>
<tr>
<td>2. Difficulty monitoring the flow of older adults through HCNOA.</td>
<td>Shared management between CREASI and primary care</td>
<td>Standardize operational flow routines between CREASI and primary care.</td>
</tr>
<tr>
<td>3. Lack of specialized health care centers for older adults.</td>
<td>Matrix support and continuing education</td>
<td>Strengthen CREASI's matrix support and continuing education in HCNOA in the state of Bahia.</td>
</tr>
<tr>
<td>4. Lack of communication between the municipal and state spheres in the management of HCNOA.</td>
<td></td>
<td></td>
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<tr>
<td>5. State managers have little knowledge about municipal and organizational problems related to older adult health.</td>
<td></td>
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<tr>
<td>6. Primary care referrals inconsistent, leading to referrals from public and private services to CREASI.</td>
<td></td>
<td></td>
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<tr>
<td>7. No clear criteria for referring patients to CREASI.</td>
<td></td>
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<tr>
<td>8. Specialty care without a multidisciplinary follow-up in both HCNOA and CREASI.</td>
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<tr>
<td>9. Demand exceeds CREASI’s capacity.</td>
<td></td>
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<tr>
<td>10. Health professionals are unprepared to care for older adults.</td>
<td></td>
<td></td>
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<tr>
<td>11. Matrix support difficulties due to the lack of protocols and human and physical resources.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Continuing education not directed to the real problems of primary care professionals.</td>
<td></td>
<td></td>
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<tr>
<td>13. Little dissemination of gerontological content.</td>
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HCNOA: health care networks for older adults; CREASI: State Reference Center for Older Adult Health Care.

This scale has been described as an objective instrument with clear functional assessment criteria. Easy access to the reference form was provided on CREASI’s official website to facilitate patient referral. Most respondents reported satisfaction when receiving a return from CREASI through the ICP. The staff reported that the new model represented an effective strategy for exchanging information, despite the difficulty of implementing it in the PC routine. This level of interaction did not exist in the previous model and was considered an advance in older adult health management. However, a minority of PC professionals reported preferring the current management model. This may be related to the restricted access for robust older adults and the co-responsibility of PC professionals, who refer older adults to CREASI, and the mandatory sharing of older adult care among HCNOA services.

The CREASI mini-team reported that the new model promoted multiprofessional interaction and that MCD facilitated therapeutic planning. On the other hand, they mentioned the excessive time required to assess older adults in the new model and the difficulties in synchronizing schedules for the MCDs. Issues related to interventions, complementary exams, and referrals to other professionals, such as psychologists, nutritionists, and specialist physicians, were decided together after the MCD. Consensual decision-making in the MCD was considered a positive advance that helped resolve previously identified problems. All respondents mentioned that working together with different types of professionals fostered an exchange of experiences and facilitated the decision-making process through quicker information exchange. The staff reported that treating only frail older adults is tiring, difficult to manage, and is less effective.

The standardized operational flows and the forms and documents for each component of the new model were received by the managers of the involved institutions. After training, the reference form reduced rework due to incorrect filing of the referral documents with CREASI. The rules established for referring patients to CREASI were considered positive by PC management and older adult health technicians in Salvador. The health districts of this municipality refer more than 70% of CREASI’s patients. This is due to regional proximity, which results in lower displacement and accessibility costs for the population.

All involved institutions reported that the new care model improved the flow of information, reduced rework, and improved information exchange about older patients. CREASI expanded its role in HCNOA and strengthened its matrix support and permanent education. Stakeholders recognized that CREASI was important for managing the health of older adults and agreed with the principles of the National Health Policy for Older Adults. All involved parties perceived that adjustments to the model were needed and that there was a good chance that the current model could be improved in the long term. The main differences between the current and new models are presented in Table 2.
TABLE 2. The main differences between current and new care models of comprehensive health care for older adults.

<table>
<thead>
<tr>
<th>Component</th>
<th>Current model</th>
<th>New care model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient referral to CREASI</td>
<td>Any doctor/nurse from the private or public health network</td>
<td>Any primary care doctor/nurse</td>
</tr>
<tr>
<td>Patients admitted to CREASI</td>
<td>Any older adult with a chronic illness</td>
<td>Older adults considered frail according to clinical functional stratification</td>
</tr>
<tr>
<td>Older adult care strategy at CREASI</td>
<td>Specialty clinics</td>
<td>Multiprofessional teams</td>
</tr>
<tr>
<td>Shared management between CREASI and primary care</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Primary care as the sole responsible party for referring older adults</td>
<td>No</td>
<td>Yes</td>
</tr>
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CREASI: State Reference Center for Older Adult Health Care.

**DISCUSSION**

This study describes the CREASI-led construction of a new care model for comprehensive older adult health care. This model was developed in conjunction with stakeholders to meet specific demands and ensure greater adherence. The theoretical framework of the new model is based on Wagner’s chronic disease management model. Wagner and others had previously understood that patients with chronic diseases and their families needed integrated support between primary and secondary care. Interactions between health services must be systematized and planned to improve functioning and prevent exacerbations and complications. Wagner’s model states that health services must be linked over time by clinically relevant information systems for effective longitudinal monitoring. Public health programs in several countries have adopted the chronic disease management model, with consistently positive results.

Older patients’ perceptions about the ideal care process align with the chronic care management model. The commonality between the ideas of older adults’ and the proposed model lies in patient-centered and individualized care that resolves problems and prioritizes change and multidimensional decision-making. The presence of a trained professional to establish direct contact with the user, managing individual demands, and longitudinal follow-up have been reported as fundamental elements for the success of programs based on the chronic care model.

The new care model appoints nurses as care managers, considering that these professionals have specific training to act in this role. Network models have been prioritized in other countries, such as Australia. In this country, primary and secondary care work together to assist older adults with dementia in a model similar to that used in the present study. Case management involves contact with older patients to monitor the effectiveness of referrals to other sectors of CREASI and HCNOA. Efforts to improve integration between HCNOA agencies are encouraged by the Unified Health System and must agree on the responsibilities of different spheres of the government. In this context, CREASI assumes a key role in the systematization of health management for older adults in Bahia, since it is the only specialized reference center in the HCNOA.

CREASI’s functions include specialized care for the most vulnerable older adults and also strengthen the network through matrix support and continuing education. To assume this role, the relationship with PC must be properly established through specific rules and regulations to effectively control the flow of patients to CREASI. Since the adjustments implemented in the HCNOA affect the work routines of both PC and CREASI, a search for directly involved professionals is necessary. Actions that require a proactive attitude should be employed progressively, valuing patient participation at all stages of the process.

The new model affected the work routines of CREASI professionals the most. Thus, in an effort to increase engagement and adherence to the new model, the working group paid specific attention to these professionals. Since their adherence has a direct impact on care quality, the operational flow was designed with their direct participation. New forms needed to be developed and standardized to systematize new routines for referring patients to CREASI, screening, initial consultations, return consultations, multidisciplinary team discussions, shared treatment with PC, and consultation with other CREASI specialists.

The professionals had an educational and training role throughout the study, since the new model brought a vision of care centered on users and their families. This can be defined as a cultural change in the approach to older adult health by leveling health conditions in the social, psychological, and functional context. The care model, which is based on functionality, focuses on the individual in a broad and comprehensive...
way. Thus, in the new model, access to CREASI is based on the older patient’s clinical-functional stratum.

In view of the above, it is concluded that HCNOA in Bahia need better integration between agencies to continuously improve patient flow in the network. The restructuring of the health care model represented a reorganization of the relationships between HCNOA agencies, expanding the role of CREASI in the management and systematization of older adult health. This included improving the scheduling system. The PC institutions in metropolitan area of Salvador were instructed to refer only frail or pre-frail older patients to CREASI. Professionals and managers in the HCNOA perceived that the efficient follow-up of older patients in PC was an important advance in improving health care for older adults. The strategy of co-creation and participatory action research made it possible to exchange experiences, requirements, and perceptions, enabling the construction of an inclusive model adjusted to the political, social, and cultural context in which it operates. It is likely that the steps taken to build this model are applicable to other HCNOA at the national and international level, considering the context and the collaborative participation of all involved.

Conflict of interest
The authors declare no conflicts of interest.

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Authors’ contributions
DON: Conceptualization, data curation, formal analysis, investigation, methodology, resources, writing – original draft. CLS: Conceptualization, data curation, formal analysis, resources, writing – original draft. HPON: Conceptualization, data curation, investigation, methodology, project administration, resources, writing – review & editing. MPF: Conceptualization, data curation, formal analysis, investigation, methodology, project administration, writing – review & editing. CMC: Data curation, investigation, methodology, resources, writing – review & editing. JCS: Formal analysis, investigation, methodology, resources, writing – review & editing. JMG: Data curation, investigation, methodology, writing – review & editing. JCP: Conceptualization, formal analysis, investigation, methodology, project administration, resources. KOBS: Formal analysis, writing – review & editing. JGVM: Formal analysis, writing – review & editing.

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