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# Project-based learning and medical education: experience report introducing issues for interprofessional debate

## Aprendizagem baseada em projeto e a formação médica: relato de experiência introduzindo questões para o debate interprofissional

## *El aprendizaje basado en proyecto y la formación médica: informe de experiencia que introduce cuestiones para el debate interprofesional*

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## Abstract

Project-based learning guided by the fundamentals of interprofessional education is a model that can contribute to the formation of interpersonal relationships, creativity, empathy and collaboration within medical education, through mutual collaboration with health professionals in the health network. Much has been said about the effectiveness of this method in medical teaching and learning, but there is a need to include the importance of developing interprofessional skills, with collaborative teams, within extension actions, in view of local needs in the context of primary care, thinking about the improved health outcomes. The objective of this work was to present a report of a project-based learning experience of medical students in Family Health Strategy. Students from the Teaching, Service and Community Integration Module of the Faculty of Medicine of Universidade Federal dos Vales do Jequitinhonha e Mucuri participated in this work, executing in collaboration with an interprofessional team a project about men's health. As a result of the qualitative analysis of the feedback among the members, changes in student behavior were observed with improvements in communication, empathy and interpersonal relationships through collaborative work with the interprofessional team. This experience can be adapted to implement teaching and learning in the pedagogical project guided by interprofessional education in primary care.

**Keywords:** Medical education; Interprofessional education; Health personnel; Patient care team.

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## Resumo

A aprendizagem baseada em projeto orientada pelos fundamentos da educação interprofissional é um modelo que pode contribuir para a formação de relacionamentos interpessoais, criatividade, empatia e colaboração na educação médica, por meio de uma colaboração mútua com profissionais de saúde da rede. Muito se fala da efetividade desse método no campo do ensino e aprendizagem médica, mas há a necessidade de incluir a importância do desenvolvimento de habilidades interprofissionais, com equipes colaborativas, em ações extensionistas, diante das necessidades locais no contexto da atenção primária, pensando na melhoria dos resultados de saúde. O objetivo deste trabalho é apresentar um relato de experiência de aprendizagem baseada em projeto de estudantes de Medicina no contexto da Estratégia Saúde da Família. Participaram deste trabalho estudantes do Módulo Integração Ensino, Serviço e Comunidade da Faculdade de Medicina da Universidade Federal dos Vales do Jequitinhonha e Mucuri que executaram, em colaboração com uma equipe interprofissional o projeto sobre a saúde do homem. Como resultado da análise qualitativa do feedback entre os integrantes, observaram-se mudanças no comportamento dos estudantes, com melhorias na comunicação, empatia e nas relações interpessoais, por meio do trabalho colaborativo com a equipe interprofissional. Esta experiência poderá ser adaptada para implementar o ensino e aprendizagem no projeto pedagógico orientado pela educação interprofissional na atenção primária.


**Palavras-chave:** Educação médica; Educação interprofissional; Profissional de saúde; Equipe de cuidados de saúde.


## Resumen

El aprendizaje basado en proyectos y guiado por los fundamentos de la educación interprofesional es un modelo que puede contribuir a la formación de relaciones interpersonales, creatividad, empatía y colaboración dentro de la educación médica, a través de la colaboración mutua con los profesionales de la salud en la red de salud. Mucho se habla de la efectividad de este método dentro de la enseñanza y el aprendizaje médico, pero es necesario incluir la importancia del desarrollo de habilidades interprofesionales, con equipos colaborativos, dentro de las acciones de extensión, frente a las necesidades locales en el contexto de la atención primaria, pensando sobre los mejores resultados de salud. El objetivo de este trabajo es presentar un informe de experiencia de aprendizaje basado en proyectos de estudiantes de medicina en la Estrategia de Salud Familiar. Participaron en este trabajo estudiantes del Módulo Integración Enseñanza, Servicio y Comunidad de la Facultad de Medicina de la Universidade Federal dos Vales do Jequitinhonha e Mucuri que ejecutaron en colaboración con un equipo interprofesional el proyecto sobre la salud del hombre. Como resultado del análisis cualitativo de la retroalimentación entre los integrantes, se observaron cambios en el comportamiento de los estudiantes con mejoras en la comunicación, la empatía y las relaciones interpersonales a través del trabajo colaborativo con el equipo interprofesional. Esta experiencia puede adaptarse para implementar la enseñanza y el aprendizaje en el proyecto pedagógico guiado por la educación interprofesional en atención primaria.


**Palabras clave:** Educación médica; Educación interprofesional; Personal de salud; Grupo de atención al paciente.

# INTRODUCTION

Providing quality care is a shared responsibility between several health professionals, requiring collaborative and effective actions. Brazil's Unified Health System (SUS) requires professionals committed to its principles, namely integrality, equity and universality. It is imperative to implement changes in the logic of health education and work with the aim of transforming a hegemonic model of care, centered on the disease and/or professionals, into a model focused on the needs of people, families, communities and areas.[1]

Students in the health field must learn essential skills for the training of a 21st century professional, with communication, critical thinking, collaboration and creativity, as well as connectivity and citizenship, being necessary skills.[2-5] Achieving these skills requires changes in curriculum and assessment, in the use of teaching and learning methodologies, in investment in professional development and in a teaching environment that encourages student participation.[6] As part of these changes, there is a direction: changing higher education from a teacher-centered, instructivist model to a student-centered, constructivist approach through active learning.[7-9]

In active methodologies (AM), the student is the protagonist of useful and real learning, stimulating formative contributions of teamwork and the socialization of knowledge.[10] By proposing training for a differentiated performance in SUS, these methodologies challenge the trend of professional performance that is isolated, individualistic and fragmented.[11] Among AM modalities, project-based learning (PBL) acquires

important space as a methodological approach. According to Bender,[12] it enables the development of 21st century abilities and skills through the active involvement of students in the design and implementation of projects based on demands or problems existing in the social context of students' practices.[12]

However, PBL planning is challenging, which requires careful attention to the foundations of this model so that it can be implemented in practice in a viable way. Thus, aspects such as anchor, cooperative teamwork, driving question, feedback and review, investigation and innovation, opportunity and reflection, investigation process, publicly presented results and student voice and choice must be taken into consideration.[12] PBL is part of transformative education with sustainable learning and leads students to assume their commitment to society.[13] It allows developing essential skills for problem solving, a sense of responsibility, working in pairs, critical thinking, self-confidence, management of time and communication.[14] A study by Hutchison[15] states that PBL is also a strategy for teaching empathy to university students in an interdisciplinary context.

Given the skills necessary for a 21st century student, carrying out extension projects, through the use of PBL in medical education, also proves to be a promising space for developing interprofessional work skills. Within the scope of this reality, interprofessional health education (IPE) attributed by the World Health Organization (WHO), in 1973, emphasizes the incorporation of interprofessional training as a response to the demand for teamwork and a comprehensive approach to health needs.[16] WHO notes that IPE requires a set of enablers that include visionary leadership, institutional support, mentoring and learning, and practice environments.[17-19]

IPE is an interactive learning approach that aims to provide theoretical and methodological support to ensure the training of professionals more capable of effective teamwork and to provide quality care for the community, enriching the PBL used in the education of health professionals. Much has been said about the impact of using PBL in medical education, but this report sheds light on the perspective of inserting interprofessional education as an opportunity for medical students to participate in interprofessional implementation actions. Thus, the objective of this work was to present a report on the project-based learning experience of medical students in Family Health Strategy (FHS), describing the effects on medical training and the contribution of interprofessional health relationships.

## METHODS

### Context of experience

The present work is an experience report on the idealization and execution of a collaborative extension action within the scope of the theoretical-practical discipline of Public Health, which involved the involvement of a group of health professionals, such as doctor, nurse, pharmacist, nutritionist, physical educators and physiotherapist. This work describes the implementation of one of the teaching and learning practices of the longitudinal modules Teaching, Service and Community Integration Practices I, II, III and IV (PIESC I, PIESC II, PIESC III and PIESC IV) at the Faculty of Medicine of the University Federal dos Vales do Jequitinhonha and Mucuri (FAMED/UFVJM), which occur respectively in the 1st, 2nd, 3rd and 4th periods of the degree, comprising a workload of 72 hours for each module, with 4 hours per week. The longitudinal model allows for more comprehensive interactions between the student and the patient over time, in addition to providing students with a unique experience with the FHS health service team and the community.[20]

These modules have as pedagogical objectives a set of pillars, content that support and cover the principles and guidelines of SUS, Primary Health Care (PHC) and Family and Community Medicine (FCM).[21,22] In them, the execution of territorialization, family risk stratification, home visits and screening within the scope of FHS.[21] They also seek to understand health planning and social participation and use health surveillance as a tool for permanent monitoring of the population's health situation, controlling the social determinants of health and ensuring comprehensive care.[21] The development of a health education project guided by PBL[12] is also part of the objectives of these modules.

All modules are composed of theoretical and practical content, with practical activities carried out through the Rede-Escola in the same FHS in a neighborhood in the city. These activities take place with the same health team and population assigned to the unit, with the group of students and the corresponding FHS being established in the 1st period (PIESC I), which remain unchanged until the 4th period (PIESC IV).[21]

This curricular activity, a health education project guided by PBL, was designed and executed by a team of 11 students, during the second semester of 2021 and the first semester of 2022, and coordinated by the teacher of the PIESC III and IV modules. The project was designed and written during PIESC III (3rd period of 11 students) and executed during PIESC IV (4th period) by the same students who wrote it. The strategy for this project was developed in collaboration with the municipality's Interprofessional Team (a team equivalent to the old Núcleo Ampliado de Saúde da Família — NASF) model,[23] made up of physical educators, a pharmacist, a physiotherapist, a nutritionist and a psychologist, in addition to assistance from a doctor, nurse and community health workers (CHW) of FHS, and it was based on the assumptions of Learning Together to Work Together,[24] Framework for Action in Interprofessional Education and Collaborative Practice[25] and PBL,[12] the scope of actions of the Interprofessional Team, meet the formation and coordination of Smoking Cessation Groups in FHS in the municipality of Diamantina (MG) since 2018, which, among a set of actions, is part of the National Tobacco Control Program (PNCT).

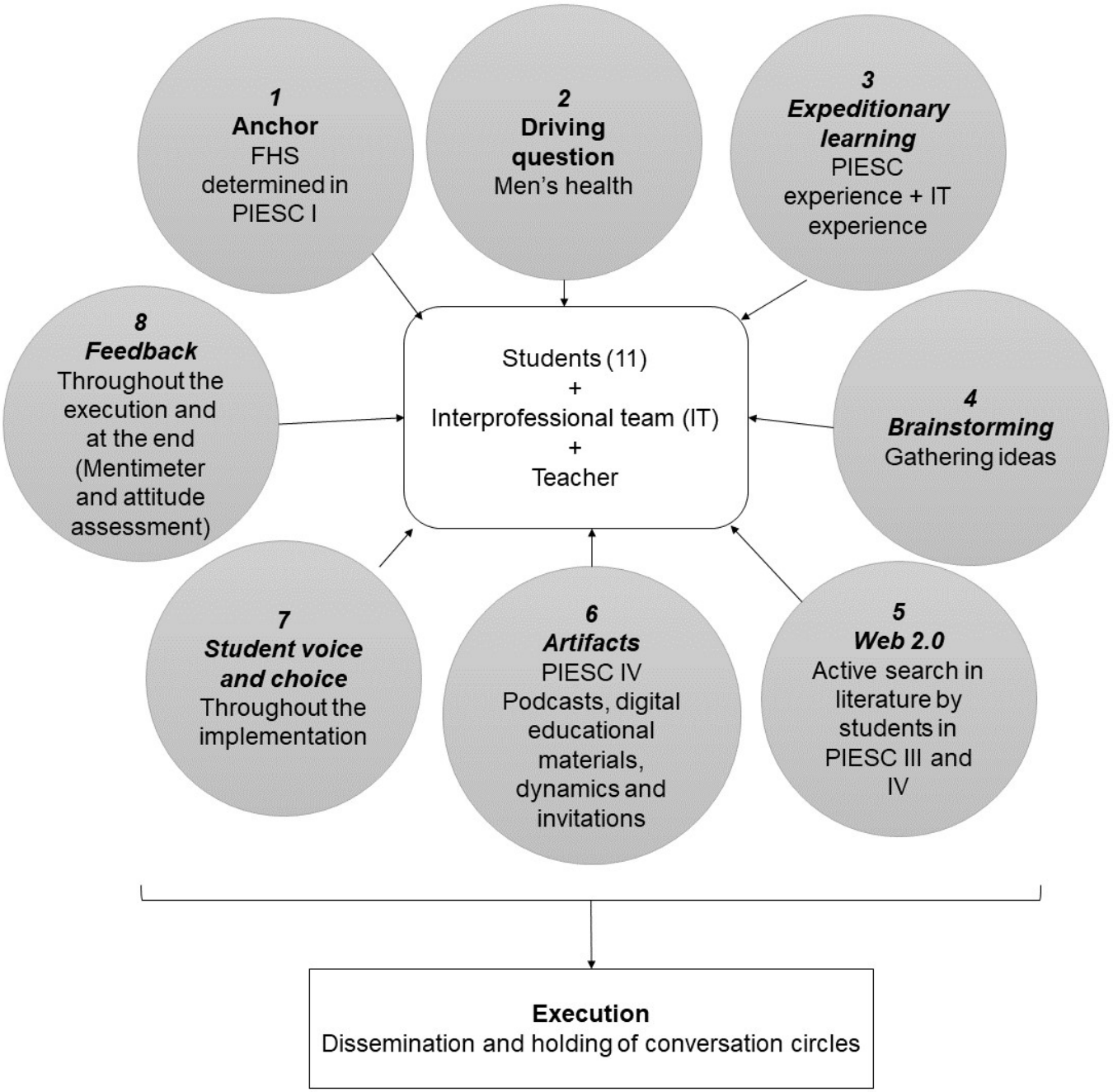
### Ethical considerations

According to Resolution No. 510, of April 7, 2016, of the National Health Council,[26] this report falls under item VIII of the first article, and submission to the Ethics Committee for Research with Human Beings was not necessary.

## RESULTS AND DISCUSSION

### Men's Health Education Project and the elements of project-based learning

This health education project consisted of an extension action that took place in an undergraduate Medicine course and was designed and executed based on the elements of PBL, as shown in Figure 1. It began with the execution element "the anchor ",[12] which in the present work was the health service itself in which the students were involved and active during the four modules. The "driving issue"[12] was men's health, a theme chosen in conjunction with the experience of the Interprofessional Team, during a face-to-face meeting at the FHS, due to the reality of low male adherence to health services among the population assigned to the unit under study, which was in line with student observation throughout the four modules.




Source: authors (2023).
FHS: Family Health Strategy; PIESC: Teaching, Service and Community Integration Practices.
**Figure 1.** Structure of the project Health Education guided by the elements of project-based learning.

In the third element, "expeditionary learning", students used their previous experiences in the health service during the three previous modules (PIESC I, II and III) to support the development of the project, expanding their potential through reflection[12] and search of an answer to the driving question. The experience of the Interprofessional Health Team regarding men's health in the FHS was also used. At the same time, "brainstorming" took place, with the survey of innovative ideas for action and work plans for the development of the project,[12] which occurred together with the Interprofessional Team and the responsible teacher.

In the fifth element, "Web 2.0", students acquired new theoretical knowledge about men's health through information available in literature, adding quality to the actions carried out during the intervention.[12] This theoretical support occurred previously and during the preparation of the project, already at PIESC III, and studies continued until PIESC IV during the implementation of the project.

This was followed by the production of "artefacts"[12], which took place during PIESC IV, with the creation of podcasts and digital educational materials for dissemination through social media and radio, involving men's health issues. All materials were produced by the students, using as support the theoretical knowledge acquired in the "Web 2.0" stage, in addition to the collaboration of the Interprofessional Team and guidance from the teacher responsible for the module. The team of the CHW of the FHS under study provided a list with the contact details of men assigned to the unit, which was used to create a WhatsApp group. Educational materials were distributed to this group, as well as an invitation for men to participate in the conversation circle that would take place.

Dynamic materials were also created to hold a conversation circle, in which the Interprofessional Team was also present — all with the aim of achieving the objective proposed by the project. The materials consisted of printed images of different examples of foods and questions in myth or truth format. The conversation circle was publicized in four ways for five weeks, once a week, at the time stipulated for PIESC IV, through: distribution by the FHS team of physical invitations; dissemination through WhatsApp and local radio; invitation, awareness and health education during physical activity group activities with the FHS population in collaboration with the physical educators of the Interprofessional Team and the module coordinating teacher; invitation, awareness and health education through the approach of men who attended the unit for care and/or reception, in face-to-face collaboration with professionals from the Interprofessional Team, such as nutritionist, physiotherapist and pharmacist.

The conversation with the men took place during a morning in a space provided by FHS and was attended by two participants, in addition to the 11 students, teacher and Interprofessional Team. The topics chosen for the moment were healthy eating and prostate cancer, addressed in a dynamic way through representative images and questions based on the myth and truth model about the subjects. The work was conducted by students in collaboration with the Interprofessional Team. Participants had to be actively involved in the moments, raising doubts.

The seventh element, "student voice and choice",[12] occurred throughout the development of the intervention, offering autonomy to students in the idealization and execution of the project, with the support and encouragement of the responsible teacher and the Interprofessional Team. Finally, the "feedback and review" stages occurred constantly throughout the execution of all phases of the project, between the students, teacher and Interprofessional Team, in addition to the assessment of attitudes and feedback that occurred at the end of each module of PIESC between students and responsible teacher.[12]

At the end of the project, feedback was collected from the student creators through the Mentimeter program,[27] website/application used to collect data interactively. Students had the opportunity to respond, in up to four words, about their experience during the execution of the project. Through this program, an analysis and comparison of the data collected was carried out in a brainstorming format (word cloud).

## Repercussions on student learning

The training of a health professional is a collective, interprofessional effort and must be recognized, supported and formalized. From the point of view of medical training, the PIESC I, II, III and IV modules, at

FAMED/UFVJM, which take place in PHC, guided by FHS, are a space for interprofessional training, but require a more integrative focus on the education of future health professionals.[28] In the current scenario of medical training at UFVJM, there is an investment by the coordination in strengthening less teacher-centered methods and implementing learning aspects such as aptitude for research, communication skills, interpersonal relationships, creativity and teamwork, taking into account the skills necessary to better train a professional in the 21st century.[29]

Academic knowledge is based on perspectives of learning, development and change, and these subjects can be developed through a project.[30] The student's experience from the beginning of training in PHC provide benefits to the humanization of care and adherence to empathetic behavior. Institutions that are willing to train in this scenario are capable of developing the technique for a more humanistic approach and treating the patient not the illness from early on.[31] In the UFVJM Medicine course, students experience this training experience in PHC from the very first semester, through a school network with an emphasis on community-based education, using FHS as a partnership and assistance model. The health units that are part of this school network are established in communication with local health management.[21]

In PBL at UFVJM, assigned projects are related to students' real-life circumstances, offering them the opportunity to study and act on their own, under the supervision and advice of teachers in terms of ideas and project planning. PBL, as an extension action, stimulates student engagement, and this experience favors the development of interpersonal relationships, in addition to being a form of motivation for students to work on solving problems in the context of public health.[12] Thus, PBL is a strong strategy for medical training with the aim of achieving the training of health professionals with the skills necessary for the 21st century.[29]

In the health area, UFVJM, with actions coordinated by the Deans of Undergraduate Studies, Research and Extension and Culture (Proexc), promotes educational processes through notices published annually. FAMED/UFVJM also provides conditions in its pedagogical project for students to interact with other courses in health, human and social sciences, and others.[21] These are pedagogical scenarios that can adopt sociocultural theory and communities of practice, as well as interprofessional education, as learning perspectives in the workplace.[28]

The projects developed during the PIESC modules extend to the community the opportunity to access interventions aimed at the reality of community health, capable of improvement or lacking actions — processes that are recommended by the National Curricular Guidelines (DCN) of the course of Medicine.[32] However, specific and brief actions are generally carried out, making it necessary to expand and implement an extension project through submission to Proexc notices. This would allow us to offer continued care to the community and an interprofessional health partnership, in addition to the possibility of collaboration with students from other health courses, issues recommended by the National University Extension Policy.[33] The continued presence of an action in a selected community allows for better integrated decision-making with the population and the return of information and also the effective detection and confrontation of local problems.[34]

PBL is an educational tool that has been recognized for its effectiveness; however, it is interesting to discuss the implementation of interprofessional education from the perspective of this type of teaching approach, with the present report being an example of work carried out along the lines of PBL, complemented with interprofessional collaboration. Interprofessional education offers a proposal to combat the fragmentation of healthcare work and a democratic perspective on knowledge construction, being a learning format that prepares healthcare graduates for collaborative work in clinical environments.[35,36]

This reality can be observed when evaluating the perception of students in this project about their experience during execution (Figure 2). Figure 2 shows that the words with the most emphasis in relation to the students' experience during the execution of the project were teamwork, planning and adaptation. The contribution of the Interprofessional Team to academic training is evident, leading to the development of teamwork skills effectively.


Source: authors (2022).
**Figure 2.** Word cloud of keywords most cited by students at the end of the project execution.

The interactive experience between students and the Interprofessional Team makes us rethink, in the training of medical students, how much progress has been made in understanding teamwork. This collaborative and cooperative process also proved to be relevant for the consolidation of health education programs already developed by the team in the municipality, such as: smoking, alcohol misuse, use of medicinal plants, rational use of medicines in health units and physical activity, among other existing ones. Finally, the importance of medical training as a factor for health quality stands out,[37] considered a goal of the WHO and Brazilian Association of Medical Education.[38,39]

It is necessary to emphasize that effective interprofessional education in the context of medical graduation, still associated with the application of PBL, requires several efforts. An Interprofessional Team from a municipality requires following a pre-established agenda, just as students follow a semester schedule. These and other obstacles must be studied to obtain effective results. Therefore, institutional investment is needed to face the difficulties in implementing interprofessional education as a strategy to implement PBL in the pedagogical project of the Medicine course.

Finally, it is necessary to highlight that, in carrying out this work, there were limitations, such as the schedules of the modules' curriculum, which allowed students to offer activities to the community only at these pre-established times, limiting access for the target population (young male population). A continuation of the work carried out in the module for a continued extension project and submitted to Proexc, as suggested in this work, could resolve these barriers in terms of the schedules offered.

## CONFLICT OF INTERESTS

Nothing to declare.

## AUTHORS' CONTRIBUTIONS

TMMS: Conceptualization, Data curation, Methodology, Formal analysis, Project administration, Writing – original draft, Writing – review & editing. CMFNC: Conceptualization, Methodology, Writing – original draft. LLC: Conceptualization, Methodology, Writing – original draft. DS: Conceptualization, Methodology, Writing – original draft. DFS: Conceptualization, Formal analysis, Project administration, Methodology, Supervision, Validation, Writing – original draft, Writing – review & editing.

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