

## The use of multiple triangulations as a validation strategy in a qualitative study

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**Abstract** *This paper aims to present the use of triangulation in qualitative research as a strategy to achieve the proposed objectives, to ensure credibility, reliability, and greater scientific accuracy in its achievement. In this sense, triangulation – since it is not restricted to the use of only one method, theory, data source or researcher in the process of analyzing an event – allows the apprehension of a given reality from several angles, enabling information confrontation, in order to minimize bias resulting from a single analytical perspective. Thus, aiming at evidencing the possibilities of using such a methodological design, we used as an example a qualitative study about experiences of caregivers for patients with head and neck neoplasms, developed through multiple triangulation, namely: methodological (intra-method), data, researcher and environmental triangulation. When demonstrating a structured study in the form of triangulation, one aims to guide researchers interested in conducting qualitative studies with greater depth and methodological rigor in qualitative research.*

**Key words** *Methodology, Qualitative research, Methods, Caregivers, Neoplasms*

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## Introduction

Qualitative research is marked by a strong humanistic, interactional, and empathic factor. This type of research takes place on the set of meanings, values, beliefs, and social behaviors that would not be quantifiable. In the health area, qualitative studies allow grasping the conceptions of users, professionals, or managers regarding the various issues involving the services and care offered to experience health, illness, death, among other situations<sup>1</sup>.

Due to the characteristics that underlie qualitative research, this is the subject of constant questioning regarding its scientific rigor, which is linked to the criteria of reliability, validity, and generality used in its development. However, these criticisms build on quantitative assumptions, which do not respond to the objectives of qualitative research that seeks to understand, analyze, and describe a given event and not to measure or quantify it<sup>2</sup>.

Qualitative research is not based on statistical methods to ensure the reliability and validity of data and results. However, it is possible to use methodological strategies that ensure transparency, methodicity, and fidelity to evidence, ensuring the refinement of the data produced, as well as credibility and reliability during the planning and implementation of this investigative methodology<sup>3</sup>.

Triangulation is one of these strategies for improving qualitative studies involving different perspectives, used not only to increase its credibility by involving the use of two or more methods, theories, data sources and researchers, but also to enable the understanding of the event under different levels, thus considering the complexity of the study objects (complex problems and living conditions)<sup>4</sup>.

Based on these foundations, this paper aims to show, through a study on the experiences of caregivers of patients with head and neck neoplasms, how the triangulation in qualitative research can be used and how it enables more accurate data to understand a given event.

### Some points on triangulation in qualitative research

In recent years, the discussion about the use of more than one method in the process of data production and analysis of the same event is very present in social research, especially in qualitative research as a strategy of validation and assurance of greater scientific rigor. The discussion about

the subject is diverse and permeates different concepts brought by the research, such as the multi-method approach<sup>5</sup>, mixed methods<sup>6,7</sup>, and triangulation<sup>8</sup>.

This paper addresses the theoretical frameworks that operate this process from the concept of triangulation, since the conceptions brought by the multimethod reference and mixed methods are mostly limited to their use only in perspective between methods, summarizing only their realization by the interaction between quantitative and qualitative<sup>9</sup>. The concept of triangulation, on the other hand, opens the possibility of working with different perspectives of understanding reality in a single method<sup>4,10</sup>, especially from the perspective of qualitative research methodology<sup>8,11</sup>.

We should point out, as a starting point, that triangulation as a validation strategy in qualitative research takes an entirely different form from that used in quantitative research. The latter advocates that a particular study becomes valid as another researcher, by replicating it, using the same methods, also achieves the same results. In this sense, research becomes valid when it can be measured, quantified, and generalized. In qualitative research, validation is understood from another perspective, as an indication of thoroughly and reliably planned and implemented research, in which the methodological procedures used and the results of the study are compatible and consistent with the proposed objectives<sup>12</sup>.

The literal meaning of the term triangulation does not derive from social and human science, but from navigation and topography, and is understood as a method to determine position and distance from one point taking into account the observation of two other points, which would form the shape of a triangle<sup>13,14</sup>. Therefore, originating from exact science, triangulation was initially used by health studies and quantitative social research by professionals in the field of psychology, who used multiple tests in the analysis of the same object to achieve convergent results. Subsequently, it spread to several other areas due to the possibility of making the results of a study more reliable<sup>14</sup>.

Thus, in the social and human sciences, the concept of triangulation transcends the “literal” and takes on a more diverse and complex form. Flick<sup>4</sup> shows that because social research is concerned with multifarious problems and viewpoints, the use of only one methodological perspective would not be sufficient to make a complex event empirically understandable, and, thus, the triangulation approach is critical in this

process, as this allows the consideration of the different levels of depth that the unveiling of an event requires. Thus, the author<sup>4</sup> believes that the term triangulation refers to the search for understanding an event from two or more perspectives or methodological approaches.

Denzin<sup>10</sup> addresses triangulation as a research validation strategy that can be performed through four different methods. The first concerns data triangulation or the use of different data sources that can be produced at different times, places, or with different people. The second would be the investigator triangulation, which consists of the use of different researchers to minimize subjective distortions arising from a single individual. The third would be the triangulation of theories, in which an event is addressed and interpreted under different angles or multiple theories to increase knowledge about the object under study. The fourth, and last, would be methodological triangulation, which may be implemented within a single method (intramethod) or between distinct methods (intermethod).

Guion<sup>15</sup> also contributes to the theme. This author affirms that triangulation would be divided into five different types. The first four types converge with Denzin's classification<sup>10</sup>. However, a fifth type of triangulation is added, namely, environmental triangulation, which refers to the use of different locations or factors such as time, day of the week, or season, in order to analyze the existence of environmental factors that may interfere or influence the production of data. The author<sup>15</sup> also highlights some characteristics about the validity of research, considering the convergence between information as the main one. For example, in the case of researcher triangulation and environmental triangulation, a convergence must occur between both the conclusions drawn by the researchers and the conclusions that result from changes in the environment.

It is essential to highlight that the conceptions and ways of assessing validity in qualitative research are diverse, since there are no universal and fixed forms for this, and are directly linked to the objectives and methodological designs of the research itself. Qualitative research seeks to understand and describe a given phenomenon, which is restricted to a particular and specific situation, through which information/data different from those achieved by statistical and quantitative methods are achieved<sup>12</sup>.

In order to illustrate the use of the triangulation strategy in the qualitative approach, we present, as follows, the development of qualita-

tive research that employed different types of triangulation (multiple triangulation) to achieve its objectives and, at the same time, confer reliability and rigor to the investigation.

## Methods

The use of qualitative methodology in this investigation is justified because it is based on the understanding of the complex human experience. The study performed an in-depth analysis of the experience of caregivers of patients with head and neck cancer undergoing radiotherapy, performed through multiple triangulation, namely, methodological triangulation (intramethod), data triangulation, researcher triangulation, and environmental triangulation.

The research aimed to know the experience of caregivers and, especially, understand how they experience care based on the characteristics of this neoplasm.

Although the caregiver presents himself through various characteristics regarding the types of relationships, the training and care provided, in this study, the participants were only informal and non-professional caregivers, those who are characterized by not having employment relationships and specific training to act as a caregiver.

The triggering problem of the study was the perspective that experiencing the diagnosis of cancer is not only experiencing the functional and symptomatic results of the disease and treatments, but also the stigmas endured in society, and this experience involves both the diagnosed patient and those who will act as caregivers.

We assumed that, as a disease associated with an idea of death, religious prejudice, pain, and fear of treatment, it brings suffering that transcends the biological sphere to both the affected patient and the caregiver, due to the underlying social, moral and cultural burden of cancer. Considering head and neck cancer (HNC), another fact is that most of the affected patients have a history of tobacco or alcohol abuse, which directly interferes with the exercise of care and the quality of life of the caregiver.

Thus, the central issue of the research was whether the fact that the patient was or is either a smoker or a drinker brings any particularity in the experience of care. Therefore, the search for patients with a tobacco or alcohol use history was necessary for the development of the study. Some other issues became essential to understand the

studied reality, and the outreach of the results by further analyzing the theme could shape a valuable range of information, such as:

- Identifying caregiver-patient relationship types;
- Understanding how the process of assuming the role of caregiver occurred;
- The meaning of tobacco/alcohol use in the disease for the caregiver;
- Identifying the ambivalent feelings of providing care and what needs are perceived by the caregiver during the care provision process.

The CESMAC University Center Ethics Committee approved the study, conducted from January to June 2017, in the radiotherapy sector of a reference hospital for cancer care in a capital of the northeast region of the country. The research participants were caregivers in their various relationships (family and non-family) and who were accompanying patients with head and neck neoplasms for radiotherapy treatment, and all interlocutors signed the Informed Consent Form (TLCE).

Data was produced through multiple triangulation to achieve the proposed objective and the answers to the questions listed, namely, methodological, data, researcher, and environmental triangulation.

According to Denzin<sup>10</sup> and Guion<sup>15</sup>, methodological triangulation can be performed between quantitative and qualitative methods (inter-method triangulation), and; internal to a method through various specific techniques relating to the method in question (intramethod triangulation). In this study, intramethod triangulation was employed using the following methodological techniques: documentary research, participant observation, focus group, and in-depth individual interviews through thematic oral history. All of these steps were recorded in a field journal.

The inclusion/exclusion criteria varied by research stage. Participant observation included all caregivers who were following and awaiting patient care in the waiting room of the Unified Health System (SUS) of the hospital's radiotherapy sector. The focus group consisted of caregivers who were caring for patients with a history of tobacco or alcohol use (the main causative agents of the disease) and who had been providing care for at least one month. Finally, the individual in-depth interviews (thematic oral history) involved the caregivers who were part of the focus group and who presented in their statements the contents of their experiences that could and should

be further analyzed. Caregivers under 18 years of age and those without physical and psychosocial participation conditions were excluded from the study.

Importantly, data triangulation intertwines with methodological triangulation, because different techniques or qualitative methods of producing these data were also used as data were generated at different times and through different documentary and human sources. Thus, data triangulation occurred in various institutional documents, field journals produced by the researchers, and the interlocution of the research subjects with both researchers and other subjects, because, while the caregiver of a patient with head and neck cancer was the subject of the research, other people who interacted with the caregiver were also observed, such as professionals, patients and caregivers of other types of cancer that were not the object of the research. On the other hand, the methodological triangulation was performed individually and through groups with different data production techniques, as already described.

Finally, the environmental triangulation in the data production occurred with the use of two locations (the SUS waiting room and the preparation space for radiation application), at three different operating hours of the sector and on different days of the week and months. It is noteworthy that other environments were also used for the research. The focus group was held in the meeting room of the very hospital where patients were undergoing radiotherapy, and in-depth interviews were conducted in an office at the same place.

As with any other methodological approach, the use of triangulation must be essential to answering research questions. Thus, it must be demanded by the object of study and not only by the researcher's particular will<sup>4</sup>. Therefore, in this research, the use of the triangulation approach was necessary due to some issues that will be listed shortly:

1. To know and define the research subjects, since there were no records and other ways of accessing them, and this was only possible through documentary research, observation and, when possible and appropriate, also through informal dialogues;

2. For the selection of caregivers who experienced the care of patients with head and neck cancer, among them, especially those who cared for patients with a history of tobacco or alcohol use – a central issue in the research;

3. For the refinement of the central research issue, which, although already listed in documentary research and observation, was only introduced in the focus group and further analyzed in the individual interviews.

Thus, each step of the study in question, i.e., each technique applied, enabled the production of data that exceeded and complemented information regarding the one produced in the previous technique (s). This process allowed the apprehension of information about the object of study in different types of knowledge and depth levels.

## Results

The steps employed as a methodological strategy to deepen the knowledge about the event that the study addressed is shown in detail next.

### Methodological triangulation and data triangulation

The documentary research and participant observation were carried out concomitantly and allowed knowing and delimiting the caregivers who experienced caring for patients with head and neck cancer and tobacco or alcohol use history. These techniques allowed researchers to participate and identify the sector's routine (schedules, flow, multidisciplinary team, among others), as well as the daily life of caregivers while waiting for the patient who was being treated.

It is essential to highlight this step as essential for the research since there was no other way to collect these data and access the subject of the study. Thus, the documentary research conducted through the study of patients' medical records and follow-up of the radiotherapy schedule coincided with the participant observation and was step 1 of the research.

The investigation in the medical records enabled knowledge about the health conditions of the patients in the radiotherapy waiting room. The list with the scheduled times of the radiation application guided the observation, as it allowed knowing how many possible caregivers of the cancer patients would be in the days and times of observation in the sector.

Besides facilitating the identification of the caregivers accompanying these patients, the participant observation allowed relating the health conditions to the act of caring, as well as identifying the first intersections with the tobacco or

alcohol use issue. This was performed from January to March 2017, in a team, with the help of a guiding script and developed in different environments (waiting room and place of radiation application).

Fernandes and Moreira<sup>16</sup> believe participant observation allows understanding the relationships between individuals and the latter with the institutions, as well as the practices, perspectives, and opinions of the research subjects, which would not be possible to apprehend through other techniques. The authors also point out that the team observation modality enables confrontation and greater richness of data produced due to the outreach of the participation of different researchers that enables considering the same reality and sharing the observation<sup>16</sup>.

During this research phase, 25 caregivers of 20 patients were observed, as more than one caregiver accompanied some patients. Attitudes, gestures, behaviors, expressions, and statements were noted at this stage – through informal conversations between caregivers with patients, with professionals, with other caregivers, and with other people, as well as with researchers –, and the technique allowed investigators familiarizing a little with the feelings, perspectives and other elements related to the provision of care to someone with head and neck cancer.

Through the observation and informal conversations, the caregivers brought several issues that emerged in the care process, these were recorded in the field journals of each researcher and, at the end, shared and compared among them to define, through inclusion/exclusion criteria, participants in the next stage of the research: the focus group.

Thus, the caregivers participating in the focus group had already integrated the first stage of research, documentary research, and participant observation, which enabled the selection of caregivers of patients with a tobacco or alcohol use history. Of the 25 caregivers who participated in the observation, based on the inclusion and exclusion criteria, 11 caregivers were invited to the focus group.

With regard to focus group size Gill et al.<sup>17</sup> point out that more people than expected must be invited, as it is better to work with a larger group than to cancel because of the small number of participants or, because of this small number, have a discussion that is not satisfactory to the research objectives.

Therefore, based on the assumptions of Gill et al.<sup>17</sup>, 11 caregivers were invited and, by tele-

phone, three informed that they could not attend and eight confirmed their presence, which would be within the perspective of the authors<sup>17</sup> who advise that the ideal number of a focus group is between six and eight participants. The authors<sup>17</sup> emphasize, however, that a focus group can be successfully performed with only three or up to 14 participants. In the case of our group, five caregivers attended, which ensured its accomplishment with a smaller than ideal and adequate participant number.

The use of the focus group in qualitative research fosters the exchange of experiences, feelings, and impressions, which enables collective reflection on a given subject. The technique configures an environment that allows the debate and in-depth discussion of research themes, but, above all, allows the knowledge and understanding of the research subjects' experiences and the meanings assigned by these subjects to the studied object<sup>18</sup>. The questions raised by researchers can stir narratives and reflections about the disease-well-being process and culminate in new meanings of the experience itself<sup>19</sup>.

In this study, the focus group lasted one hour and fifteen minutes. It was conducted by a guiding script divided into five sections: 1) the profile of each caregiver; 2) beginning of the caregiver role process; 3) intersections that caregivers made between cancer care and patients' alcohol and tobacco use history; 4) positive and negative aspects in the development of the caregiver role; 5) primary needs of the caregiver.

From the reading of the focus group statement transcripts by the researchers, followed by discussions and confrontation, it was possible to define which caregivers raised questions pertinent to the in-depth discussion of the research objectives and which, thus, would be detailed through the thematic oral history technique.

The thematic oral history technique aims to clarify the opinion of the respondent (research subject) about a specific and pre-established event to demonstrate experiences<sup>20,21</sup>. Kaplowitz<sup>22</sup> says that individual interview participants would be more likely to discuss more sensitive topics and to be stimulated to discuss different topics than focus group participants. The author<sup>22</sup> also argues that the use of individual interviews and focus groups provide different perspectives on a problem, and is not, therefore, a superior technique to another, but complementary.

In-depth interviews were conducted with two caregivers who had participated a month before the focus group and who had relevant elements

to respond to the study objective. This stage also employed a script that contained three questions previously prepared to analyze the theme further. While previous planning, transcriptions, and analysis were carried out by the research team, the timing of the interview was developed by only one of the researchers.

According to Flick<sup>4</sup>, in the process of combining different types of data, the results can be shown differently, as follows: 1. convergent, when the data produced in the different methodological techniques evidence the same results; 2. Complementary, when data produced in one technique responds to questions raised in another technique, complementing it; and 3. divergent, when the information produced in one technique is quite the opposite to that produced in another.

Data triangulation in the analysis process provided more significant support to the construction of categories by enabling their confirmation from themes that were recurrent and confirmed throughout data production techniques. However, more than convergences, and based on Flick<sup>4</sup>, we noticed, above all, the presence of data complementarity, since topics were becoming more concise throughout the techniques.

The following three statements, produced at different times, spaces, and techniques, showed the same theme that traverses the patient's tobacco or alcohol use history accompanied by the caregiver and develops at the intersection of providing care for someone with head and neck cancer with this track record.

*He (patient-husband) smoked four to five packs of cigarettes a day and also drank. He quit smoking six years ago (Participant Curió, Participant Observation).*

*He (patient-husband) smoked for fifty-six years, fifty-six, three packs of cigarettes a day if he wasn't drinking; if he was drinking, he smoked four (Participant Curió, Focus Group).*

*[...] when he drank, he had physical exhaustion, and his memory got a little bad. He was even hospitalized [...] I took care of him before he got sick from this disease. He required more care before [when he smoked and drank] than now with the disease (Participant Curió, Thematic Oral History).*

As can be seen, the same participant addresses the same theme (patient cared with tobacco or alcohol use history), showing it at different levels of depth, along with different techniques, time, and space. In the first two techniques, he shows the theme more generally, and is more specific and in-depth in the last one. Besides the

statements, in the documentary research, we also observed the tobacco and alcohol use history in the patient's medical record. In the participant observations, we identified how much this issue bothered the caregiver and how it was present in his experience.

In deepening the central question of the research (the particularity of tobacco/alcohol use of HNC in the experience of care), the physical and emotional wear of the caregiver in dealing with this situation is evident.

*[...] so during the 5 (five) days that he [patient] was hospitalized, it was great! He didn't touch a cigarette. When he got home, it was the first thing he was going to do, so that there, I stayed in order not to live, I got so much stressed sometimes that I got sick (Tecalão, GF).*

*I felt angry all right, I won't tell you, because if I said I did not, I would be lying [...] I felt betrayed because I didn't trust him, [...] He kept smoking, so ... so ... I felt as if all the work had been in vain because he had already started the treatment, and yet he was still bullshitting, so for me it was a never-ending battle that nobody was going to win, but only lose, and I would not accept losing him to this disease [...] (Tecalão, HOT).*

### Triangulation of researchers

The triangulation of researchers is characterized by the use of several observers or interviewers to “detect and minimize biased views resulting from the researcher's human condition”<sup>23</sup>. However, it should not be limited to the division of work or delegation of tasks. Its use is related to the systematic comparison of the data produced and analyses prepared by the different researchers involved<sup>23</sup>. In this sense, triangulation aims to validate the investigative process, enrich and complement the knowledge, and overcome the ever-limited epistemological potentials of the individual method.

Based on the discussions of Ollaik and Ziller<sup>12</sup> related to the different existing conceptions of the concept of validity in qualitative research, these can be classified as follows: those related to the moment of elaboration of the study (previous validity), those related to the stage of completion (internal validity) and those concerning the research results stage (external validity). In this study, the triangulation of researchers was present in the research planning, the implementation of the methods (except for the thematic oral history because it was an individual interview), and data analysis.

Prior validity was sought in the elaboration of the research, in which all the stages were organized and discussed by the research team. Thus, the choice of days, times, data production instruments, and the definition of the subjects participating in each research stage were also constructed by the set of researchers involved in the study.

This type of triangulation also in the application of the methods was relevant insofar as only one observer could not, for example, simultaneously access data from the medical records – which were the basis of the observation – and observe the room dynamics – that most of the time consisted of a considerable number of people. Also, during the observation, the use of three researchers ensured a more fruitful observation, allowing a more reliable coverage of the information, the environment, the verbal language, and, above all, the non-verbal language of the research subjects.

In the focus group, the researchers developed well-defined roles: researcher 1 was the mediator, researcher 2 was the observer and organizer of the recording equipment, and researcher 3 was the observer and rapporteur. It was possible to minimize data losses, especially those produced through non-verbal language.

The triangulation of researchers also occurred in the analysis of data produced by all methodological techniques. At the end of each technique, data recorded in individual field journals were compared among researchers to reach shared decisions.

During this process, all statements were transcribed by the researchers individually and sent to others for the clarification of expressions and words not understood in the recordings. At the end of all the techniques, each researcher, with all transcriptions at hand, performed free-floating readings followed by the identification of the central themes, which were again compared by the team in order to culminate in the construction of the categories of the study. It is noteworthy that, during the data and results analysis stage, the team added two more researchers, totaling a team of five researchers.

### The environmental triangulation

The research was conducted at the hospital's three radiotherapy shifts (morning, afternoon, and evening), on different days of the week and months and in different locations. Participant observation occurred in the waiting room (where caregivers stay most of the time) and in the space

reserved for radiotherapy (which is only visited by caregivers who are accompanying debilitated, totally dependent patients). The focus group was held in a hospital meeting room that allowed group interaction, while the thematic oral history took place in a private office room.

Thus, the environment provided by the focus group facilitated a more significant space for relaxation and dialogical exchanges, while the more restricted environment provided for thematic oral history provided a more qualified and receptive listening space, stimulating the in-depth analysis of more intimate issues.

It was observed that, even in the face of environmental changes (time, day, place), the problems regarding the caregiver's experiences remained the same, and the only aspect that changed was the level of information, which, in turn, were evidenced with a greater or lesser extent under certain circumstances.

### Final considerations

The study showed that the exercise of care in patients with head and neck cancer involves multiple realms, which begins by becoming a patient caregiver and experiencing an extraordinarily stigmatized and stigmatizing disease, permeated by various prejudices, also adding the diversity of situations experienced by the caregiver during the exercise of care.

The ambivalence of feelings also permeates care, because while patient overprotection occurs through affection and extreme care, anger, and negative feelings are noted due to the use of or return to alcohol or tobacco use by the patient. This issue is hugely significant in the life of the caregiver, who, instead of dealing with the symptoms of only one disease (cancer), starts to address other associated pathologies, alcohol and tobacco use, increasing the burden of care and social stigmas.

Thus, from the scientific viewpoint, the research could indicate the need for further studies on the experiences of caregivers of HNC patients from the specificity of the patient's alcohol or tobacco use. From the practical viewpoint, we point to the need to formulate more policies, actions, and institutional and professional interventions directed mainly to the orientation,

monitoring, and care of caregivers and HNC patients with tobacco or alcohol use. This may reflect not only positively on the patient's treatment, but especially on the quality of life of the caregiver himself.

Finally, the use of triangulation within the qualitative method facilitated, in this research, data at different levels: leaving the most general and superficial level and reaching a more specific and profound level, which allowed answering the core question of the research in question: the fact that the patient was either a tobacco or alcohol user brings significant particularities in the caregiver's experience.

In this sense, although the central problem of research (HNC tobacco/alcohol use particularity) in the experience of care was further analyzed only in the last methodological technique of data production, it is not superior to the others, but complementary. Answering the central question of research would not be possible without an outlined script, initially traversing the documentary research and participant observation, which gave access and the possibility to delimit the research subjects, as well as the focus group, in which the theme itself was introduced.

It is also important to emphasize that the use of data and environmental triangulation, without the composition with the triangulation of researchers, would allow a more limited range of information. In a metaphor with the fan figure, the research done individually by only one researcher would allow, in the case of this investigation, the visualization of only the dotted lines of its interior design. However, the participation of the research team allowed seeing the wide-open fan with all its drawings and details, and not just fractions of it.

While the use of multiple triangulation has many positive factors, its implementation has limitations and difficulties because it demands for more research time to perform all techniques and analyses, by more than one researcher in the various research stages, training and constant meetings to ensure the collective construction of results and analysis. Thus, this type of approach should be used when it is essential for the development of the study, as it requires careful planning, responsibility, and commitment from researchers, who must play their roles and at the same time, stay attuned to the team.



## **Collaborations**

KS Santos worked on the conception, design, research of theoretical and field references and drafting of the paper; DEU Queiroga, in the research of theoretical and field reference; IAP Silva, in the research of theoretical and field reference; MC Ribeiro and SMS Ferreira, in the conception, design, methodology and review of the paper.

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