NURSING

Basing patient safety education on real student experience: development of a multinational simulation scenario

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Keywords

Emotional safety • Undergraduate nursing education • Simulation • Patient safety

Summary

Introduction. *Implicit learning during clinical placements includes patient safety issues. Simulation scenarios offer ways to improve the learning process and students' awareness of patient safety. The aim of this study was to develop a prototype simulation scenario based on real student experiences.*
Methods. *This was a mixed-method study using a multi-phase design. Nursing students' experiences of workplace events they identified as possible threats to patient safety were collected between 2017 and 2019. These experiences were used to develop an interprofessional scenario about patient safety.*
Results. *A range of scenario materials were produced including a video. Participation in the scenario video had positive impacts including: "feeling safer" while performing nursing activities and more timely detection and reporting of errors. Nursing students reported that participation in the scenario taught important lessons about patient safety, communication, listening to patients and healthcare collaboration.*
Conclusions. *The role-playing methodology of the scenario provided opportunities for reflection on patient safety and improved interprofessional understanding and communication in an emotionally safe environment.*

Introduction

Nurses play a key role in ensuring patient safety [1]. Nurse education occurs in both academic and clinical settings and European law (Directive 2013/55/EU) requires at least half of a nursing education programme be delivered in clinical practice. Educating student nurses about patient safety from both academic and clinical perspectives is important [2]. Implicit learning occurring in the workplace [2, 3] can influence patient safety. Disparities between clinical practice and 'classroom' teaching may have a negative impact on students [4]. Therefore, it is important to create emotionally safe environments for learning [4, 5] and ensure close relationships between academic theory and clinical practice.
During clinical placements students may see and adopt unsafe practices that are not evidence-based. Undertaking clinical placements where there is a poor patient safety culture hinders the learning process and creates emotional dissonance in students [4]. Students often recognize poor practice but may keep quiet, influenced by a need to be accepted by colleagues [6-8]. They may be reluctant to raise concerns because of their perceived role and position [7, 9].
Innovation in patient safety education requires collaboration between healthcare faculty members, clinical practice leaders and staff at all levels and across professions [4]. Interprofessional and interdisciplinary learning offers students new understandings and alternative perspectives, encouraging the development of a broader range of reactions to patient-safety issues. New tools to improve learning processes are needed as adjuncts to traditional teaching [4].
Interdisciplinary, evidence-based simulation is one approach used as a learning instrument. Scenarios based on real events offer students the possibility to develop new skills outside the workplace [10, 11]. An essential element of simulation is debriefing, to reduce the gap between theory and practice [1-14]. Debriefing helps students solidify their relational, psychomotor, and cognitive skills [14-16]. Simulation scenarios also offer opportunity to share situations across countries with varying healthcare systems and approaches to care [17].
Jeffs et al. (2022) [32] emphasize the need for healthcare organizations, including academic institutions, to adopt proactive strategies to enhance patient safety. Academic institutions, in particular, should lead efforts to improve patient-centered, team-based care. This can be achieved by incorporating interprofessional education into curricula, providing explicit training on roles and responsibilities, fostering effective communication skills, and ensuring seamless transfer of care [33].
From a recent review of literature regarding educational

interventions to improve patient safety, Jiang et al. (2024) [34] found that a range of simulation strategies were proven to be effective, furthermore learning strategies in which real-world experiences and safety issues were discussed and addressed were important.

The European Project 'Shared Learning from Practice to Improve Patient Safety' (SLIPPS) focused on developing resources for patient safety education, that are based on real student experience, multidisciplinary and standardized [1, 3] The project supports formal and informal learning by promoting reflection on significant events experienced by students in clinical practice [1, 3]. This paper describes the methodology and process used in developing the first SLIPPs scenario, which formed the basis for development of a range of subsequent scenarios. All resulting materials are available on the SLIPPs website (https://www.SLIPPs.eu).

Methods

Aim

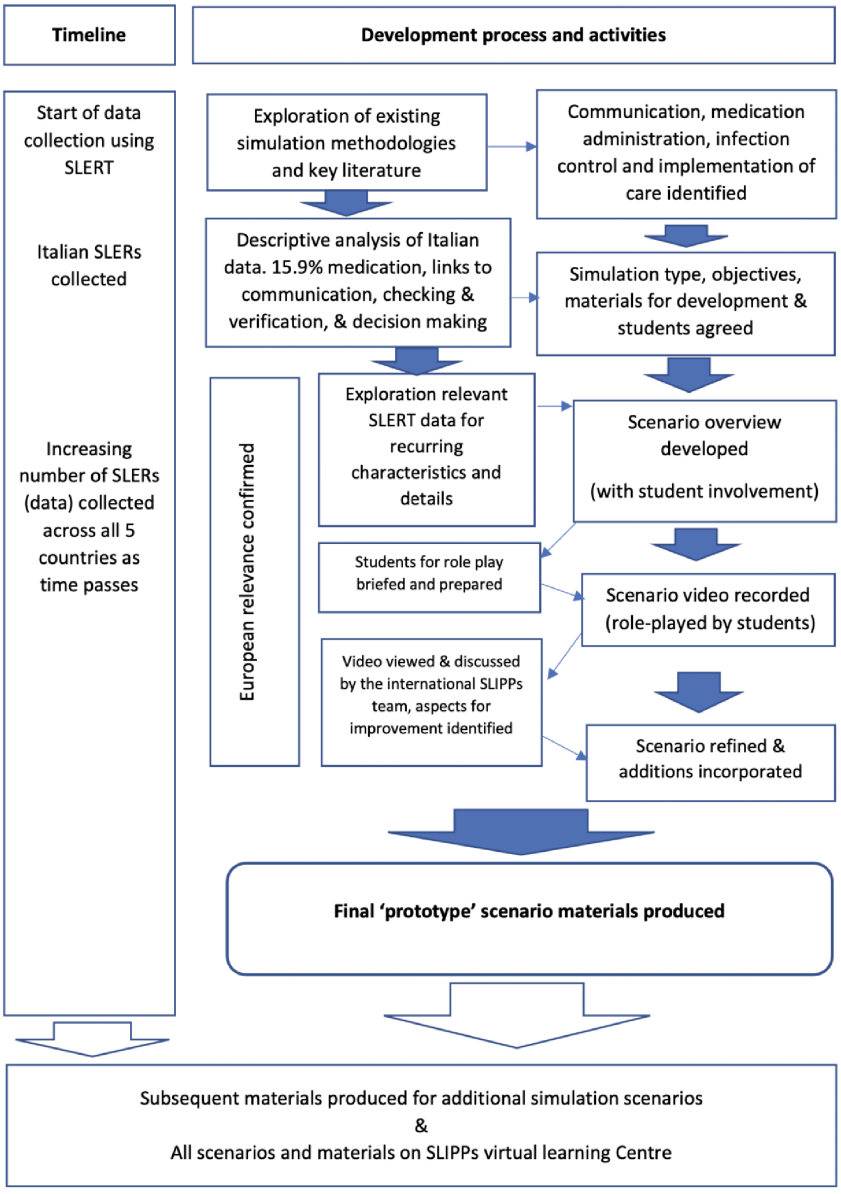
To develop a prototype scenario to facilitate learning about patient safety that:

- Is based on real experiences;
- Has a focus on medication administration;
- Includes a range of different materials (documents, guides, scripts, and a videoed version) allowing flexible use;
- Can be used with students across various stages of their education;
- Has multinational relevance.

Study design

This mixed-method study used a multi-phase design (Fig. 1). Scenario development was underpinned by the

Fig. 1. Scenario development process.



Tab. I. SLERT reports gathered.

Profession	Country					Total
	Finland	Italy	Norway	Spain	UK	
Midwifery	2	21	0	0	7	30
Nursing	59	67	29	54	87	296
Total	76	88	29	54	94	326

Nursing Education Simulation Framework (NESF) [11]. Standards and guidelines for best practice in the development and conduction of simulation scenarios were followed [18]. Materials including a video version of the scenario, were planned to allow flexibility of use (*e.g.* from live enactment of the scenario to viewing the video). After the production of the first simulation scenario, a similar methodology was followed in developing further patient safety learning scenarios (see: SLIPPs.eu).

Ethical approval

The study was approved by Liguria Regional Ethics Committee (Reg. N. 300REG2017). Appropriate ethical procedures were followed in all participating countries. Participation was voluntary and informed consent was obtained from all participants before every phase. Data confidentiality was assured, as was the option to withdraw at any time.

Data collection, analysis, and scenario development

The SLIPPs Learning Event Recording Tool (SLERT) [19] collects narrative and demographic data about students' learning experiences related to patient safety whilst in clinical placements. The tool prompts students to describe, consider, and reflect on events they feel have been important for their learning. This includes both what they learned, and the emotional investment involved (see [19] for details). The SLERT tool was used to gather 326 student reports over 18 months between 2017 and 2019 (Tab. I) from a convenience sample of nursing (n = 296) and midwifery students (n = 30) from five European countries (Italy, England, Finland, Spain, and Norway).

Data were analysed on an ongoing, iterative basis. Communication, medication administration, infection control and implementation of care emerged as topics with wide-ranging relevance. Early descriptive analysis of the Italian data (n = 88) identified 15.9% of reports (n = 14) related to medication issues. Of these, 50% (n = 7) were also identified as relating to checking and verification, 42.8% (n = 6) communication, and 35.7% (n = 5) decision making. Given the potential to incorporate multiple aspects of professional practice into a scenario focused on medication administration, this was chosen as the topic for prototype development. Subsequent ongoing analysis of data confirmed the relevance of this topic.

Scenario development

Italian nurses with expertise in clinical practice, research and education developed the prototype scenario supported by multinational SLIPPs sub-group meetings. At the outset, it was necessary:

- to define the simulation type (live participant role play), objectives, and materials to be developed (documents and video recording);
- to identify the type of students to be involved;
- to describe the proposed scene [11, 20].

Narrative exploration of a selection of relevant SLERT data enabled the identification of recurrent characteristics that were included in the scenario to ensure authenticity. Consideration was given to the type of event (*i.e.* near miss, hazard, good practice, adverse event), the complexity involved, and the year of the degree course during which the event occurred [11].

A scenario overview and general synthesis document were developed covering principal scenario elements (context, students' involvement, learning objectives, roles). Simultaneously, a script was produced outlining the role-play. This included details of the resources needed to ensure fidelity. Preparation and participation in role-play enabled students to experiment with different situations, understand what it is like to be in the situation of the patient, or another health professional, and engage in reconceptualization through picturing themselves in possible future scenarios [21, 22].

The presence of a skilled, knowledgeable nurse facilitator was also a key consideration. Facilitators orientate the students in the learning environment, conduct pre-simulation meetings to explain the objectives expected from participation and clarify the overall aim of the simulation [21]. This helps the students to act the roles to the best of their potential and work towards achieving the specific learning objectives. During the scenario, facilitators make suggestions, guide the students in their specific roles, and encourage corrections if necessary. They also play an important part in creating a sense of emotional safety for the students during their learning [4, 23]. Debriefing was planned and undertaken at end of the prototype simulation based on the '3D Model of Debriefing' [24] which involves four phases (Tab. II).

Tab. II. Guide for Debriefing.

Key questions	
1.	How are you feeling now?
2.	What were the positive actions? What went well?
3.	What do you want to improve? Would you do something differently?
4.	Have you ever been in the same situation?
5.	Take home message: what did you learn from this scenario?

First use and scenario improvement

The prototype scenario included six roles: one physician, two patients, one nursing student, one nursing assistant, and one nurse supervisor. The setting is a room with two beds on a medical ward, and while the focus is on medication administration, other elements are also included (see Box 1: scenario outline). Members of the Italian nursing team facilitated the role play, assigning roles to the students involved, explaining the scenario, and discussing participation and learning outcomes. The scenario lasted for 10 minutes, and was video recorded in its entirety. At the end of the role-play debriefing was undertaken. The video was discussed by the international SLIPPs team and aspects for improvement were identified which included adding 'pause and reflect' points and showing the text of the debriefing questions in the video (Tab. III).

Results

Following first use of the role play scenario, debriefing was undertaken with the students involved. Facilitators encouraged discussion of strengths and areas for improvement in the care portrayed. They reflected on participants emotions, and on expected and unexpected outcomes of the simulation experience. The care delivered by the role play characters (as per the script) was reviewed against best-practice. The debriefing was videotaped (with consent) and transcribed verbatim. Drawing on thematic analysis principles [25], the transcript was read by the research sub-group members, and independently coded using debriefing questions and temporal codes (before, during, after) as heuristics to help understand the formative nature of the experience.

Debriefing findings

Four themes emerged from analysis of the debriefing:

- the simulation experience itself;
- similar situations in practice;
- the emotions involved;
- the learning obtained.

When asked how they felt during the simulation performance, all felt they had been able to interpret the role assigned to them and especially reported experiencing the scenario at the emotional level:

> *"I was able to immerse myself in the simulation and this sincerely made me feel every uncomfortable as a patient; because I was the patient no one considered…I saw everything, but I understood only a part of the dynamics that were unfolding… so I felt very uncomfortable"* (PhD Student playing Mrs Taylor, one of the patients)

One issue highlighted was the difficulty of completely immersing oneself in one specific role, when that participant had in real life experienced several of the scenario roles (*e.g.*, nursing student, nurse, and patient) and identified with all of them. Those who interpreted a role they had never personally experienced were able to gain insights into the distinguishing features of that role and the differences from their own 'real' role.

> *"It was useful because it showed me that there are moments or activities that we undervalue [or give little attention to], like giving out meals, perhaps because they are not part of our[nursing] remit we do not perceive the criticality/importance of them*

Tab. III. Scenario synthesis.

Background Johanna Smith was admitted to a medical ward for hyperthyroidism. She has no clinical complications. She is awake in her bed and waiting for her morning medications. The patient is affected by other chronic diseases; therefore, she has multiple therapy and medication charts. The scenario is happening in the morning, at the beginning of the morning shift, during the medication administration round.
Scene 1: It is handover time in the medical room. The physician tells the nurse (who is starting her shift) that during the morning he will change the prescription of some medications for Mrs. Smith, but he cannot do it straight away. He tells the nurse to go ahead and administer the medications to the patients, specifying that he will see her later.
Scene 2: Mrs. Smith wants to know what kind of medicines she is going to take, because she wants to know if she must take them before or after her breakfast, which the support worker is distributing in the meantime. Meanwhile, Mrs Taylor– lying in the bed next to Mrs Smith, insistently asks the student if she can take her medication, which was left on her bedside table and that she usually takes by herself. The nursing student tells the patient that she needs to check the prescriptions with the nurse who is on duty. The nurse reminds the student to focus on the medications pertaining to Mrs Smith. While the nurse and the student check the pharmacological prescription, the physician enters the room and tells the student and the nurse supervisor that they must immediately change the dosage of Thiamazol for Mrs Smith. The student tries to remain concentrated, but the continuing distractors and the therapy spread across several sheets, do not facilitate this activity and the student is visibly in difficulty. Given the situation of risk of error, the supervisor interrupts the administration of the medicines and asks to the physician to rewrite Mrs Smith's therapy, to avoid any mistakes. After the therapy's adjustment, the nursing assistant enters the room calling for the nurse with a sense of urgency as there has been an emergency in the ward. The student, remains alone, and continues with the administration of Mrs. Smith's medicines but makes a mistake giving the patient the wrong medication. The patient, after having taken the pill, realizes that the pill had a different colour from that she was given on previous days, and asks for an explanation.
Scene 3: The student runs into the nurses' room and says to the nurse supervisor that she has made a mistake.

for the patient." (PhD Nursing Student playing a Healthcare Assistant)

When asked if they had already experienced the situation played out in the scenario in their professional lives, most of the participants said that they had all experienced something similar and recalled the emotions involved.

"Something similar has happened to me, not as a patient but as a relative...therefore I felt from the patient's position the anxiety of not knowing [what was happening], not being at the centre of things. In this situation [the simulation] I drew on that personal experience" (PhD Nursing Student playing Mrs Taylor, one of the patients)

Feelings of uncertainty or anxiety were described by students when they were unsure of their own knowledge about the medications they were administering. One participant described how a lack of communication between nurse and patient on key issues could result in feelings of discomfort and disorientation.

"It has happened to me once, or actually several times, when a patient would come to me asking why he/she had those pills in their hand, and I have had that same feeling of having made a mistake [as is portrayed in the scenario]" (Third-year Nursing Student playing the role of Manuela, nursing student)

The students stressed the power of the emotional impact of a situation whether real or simulated, and how that could serve to activate learning.

"Therefore, when the professional or student recognises the emotional impact, and above all has time afterwards to reflect and to understand why the event happened and what happened- then it can become a learning situation, a discussion or reflection. Such as is happening here now [in the debriefing], as could have happened between the student and supervisor [in the scenario]… Therefore that is the fundamental thing, to talk and say what has happened, why it has happened and what could have happened" (PhD Nursing Student playing the role of Johanna, patient receiving the wrong treatment)

Learning from the Simulation experience

Students were also asked to describe positive aspects of participating in the simulation. They were also asked to reflect on the timeliness with which the nursing student portrayed in the scenario recognised the medication administration error and communicated it to the nurse supervisor.

The character of the nurse supervisor, and the attention that she paid to the student during the role play, were reported to demonstrate positive supervisory behaviours. The depiction of teamwork and collaboration across the various professions was also identified as an important element of the scenario.

When asked if they would have done anything else, or done something differently, in a similar real situation, communication was seen as a key aspect for improvement.

Reflecting on the scenario the participants underlined the importance of ensuring that nurses have sufficient time to dedicate to each phase of the care process, without being distracted. Care delivery (including medication administration) should occur without interruptions from other people (*e.g.*, patients or healthcare professionals), which could potentially lead to errors.

"For me a fundamental thing that emerges from this simulation is the need to dedicate the right [amount of] time to each moment of activity ... to find a 'structured space' in which to undertake care delivery so that the care and clinical processes have their desired effect." (PhD Nursing Student playing the role of a Healthcare Assistant)

Finally, participants were asked to identify if they had identified a 'take home' message from the simulation experience. All agreed that the experience offered something additional to their usual activities.

"…. no matter which role we found ourselves in [in the scenario], everyone took a little piece home, whether tomorrow we return to be nurses, or in the case during our lives we end up being patients, or we return to be students…I think I can speak on behalf of everyone… Each of us has learned something." (PhD Student playing the role of Johanna, patient receiving the wrong treatment).

Development of further scenarios and SLIPPs' online learning centre

The development of the first scenario prototype resulted in a range of materials (Tab. IV) and formed the basis for the creation of a series of subsequent scenarios.

Thanks to the large number of SLERTs collected, there was a broad variety of student accounts to draw upon. Other scenarios concerned issues such as: infection control and aseptic technique in midwifery, communication, transfer of care, and hospital discharge. Suitable materials were developed to accompany each simulation scenario. These materials formed a 'library' of resources, which can be accessed on the project's website: https://www.slipps.eu/simulation-scenarios/.

Discussion

This paper outlines the development of the first SLIPPs simulation scenario for patient safety education based on real student experiences [26]. There are many reports of the advantages of using authentic (high-fidelity) scenarios to teach technical and communication skills, teamwork, interprofessional collaboration, and patient education [12, 27, 28].

The innovation in this scenario development was the extrapolation of storylines and events directly from descriptive and reflective accounts of real patient safety related events. These were drawn from the experiences of students on placement across five European countries. While scenario development was informed by 'expert' knowledge, theory, and opinion, it was situated in the real

Tab. IV. Materials relating to the scenario.

1. Guidelines for scenario development, a theoretical summary. *These guidelines offer background information providing the theoretical basis for scenario development. This offers faculty the foundations for developing new scenarios of pertinence to their context (e.g. country, clinical setting, student group, educational level required).*
2. The Scenario overview, a document giving an overview of the scenario requirements and the educational potential of the scenarios. *This outlines the topic and envisaged location and gives an overview of the simulation: design, considerations for assigning roles, approximate timings, responsibilities, potential areas of learning and learning objectives, debriefing structure etc. This document is an important resource facilitating faculty/educators to clearly identify and consider the areas of learning that can be addressed through the scenario (for example, knowledge, skills, critical thinking, decision making, student self-confidence etc).*
3. The 'Teacher template', containing the operational and technical details of each scenario. *This provides a framework for faculty/educators to plan and prepare for scenario use in their particular context. Once completed this framework also acts as a valuable record of the various elements, structure and considerations relevant to the scenario, who worked on it and what literature and theory it is based upon.*
4. The Slide deck includes a graphical synthesis of what is in the "teacher template", with the extra addition of literature insights on every theme covered in the specific scenario, available through hyperlinks to the scientific papers.
5. Where there are Scenario videos, these show (with an oral explanation) the scenario acted out. *These allow viewers to watch the scenario in action, to pause and replay elements as required., This enables faculty to tailor use of the scenarios to the students' needs (i.e. by varying time spent on reflection, or through replaying sections to allow for greater observation and analysis). The videos also offer a solution in situations where the students/faculty do not have the facilities or resources to 'act out' the situations, thus increasing accessibility to these multi-nationally developed educational resources.*
6. The Debriefing sheet contains questions to be asked during a debriefing. *Debriefing is a crucially important element of simulation use [1] which is sometimes not given sufficient attention. Based on an established model of debriefing [2] this sheet assists faculty/ educators to structure the debriefing session and prompts them to consider the functions of debriefing in order to optimise the learning that occurs.*
7. The Feedback sheet is a form to collect comments and suggestions from the scenario users (students or educators). *These enable the collection of feedback to allow ongoing development and updating of the scenarios and further tailoring to future health care practice and technology developments.*

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lived undergraduate students' experiences, reflections, and emotions.

Simulation can trigger a range of emotions for those involved. The emotional dimension of learning through experience (practice or simulation based), is important and should not be overlooked [4, 5]. The creation of an emotionally safe context in which to learn how to be a healthcare professional is also important [4, 5, 29]. The use of simulation-based scenarios allows the education of future professionals in a safe and protected environment [30].

Simulation-based education is reported as an effective strategy for improving communication skills and understanding professional roles. This was supported by the debriefing undertaken during development of the SLIPPs scenario, which enabled students to become more aware of the roles and scope of practice of other healthcare professionals. Such learning through experience, including vicarious learning as in simulation, may enhance self-efficacy. Therefore, simulation education can act as an important adjunct to practice learning by offering a rehearsal of situations and roles, fostering the internalisation of evidence-based practices, and enhancing reflection. This lays the foundations for safer healthcare delivery [3, 30].

The international character of this development, and the accessibility of the materials produced allows the creation of direct links between educators, universities, students, and, consequently, European healthcare professionals [31]. This creates new opportunities for learning. Addressing common issues linked to patient safety in different healthcare contexts allows the development of shared educational strategies. This improves patient safety in the current context of global health workforce migration.

Limitations

The principal limitation of this study is the difficulty inherent in creating a scenario with as much transferability as possible to the different European healthcare contexts. This has undoubtedly resulted in the loss of features linked to specific national healthcare contexts and cultures. Notwithstanding the production of materials in English, communication used in the scenario (*i.e.*, between healthcare professionals and patients) was specific to the care context and therefore has some transferability. 'Props' (*i.e.*, uniforms, devices, machines, equipment, *etc.*) used in the scenario can be substituted to suit a particular national context and infrastructure, thus enhancing realism and usability. We addressed limitations linked to international relevance and to ensuring that all the teaching materials were developed with rigour, by constantly sharing the study phases with the five partner countries.

Concusions

This study reported the innovative development of a prototype simulation scenario based on students' real life placement experiences of patient safety. The scenario drew on existing patient safety and simulation literature, data from the SLIPPS project, student involvement and discussions between project partners. The prototype

formed the basis for development of further scenarios.
The overall purpose of these scenarios is to act as flexible educational resources to improve student learning and ultimately the safe provision of care. The scenario materials produced can be used 'of the shelf' or tailored to fit specific needs, and in the creation of new scenarios. The use of scenarios that involve different healthcare professionals give participants opportunities for reflection on other roles and on communication between team members. This lays the foundations of high-quality future interprofessional practice. Using role play methodology in simulation also offers students the opportunity to rehearse nursing activities and interprofessional situations in an emotionally safe environment.
Involving students in an active way in the development of educational resources such as simulation scenarios offers additional learning opportunities both for the students directly involved and for the future generations. Building scenarios on students' experiences and involving them in the development of the scenario resources (videos and materials), allows them to see that the lessons possess currency, relevance and authenticity.

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Conflicts of interest statement

None.

Authors' contributions

Conceptualization, Methodology, Analysis, and overall supervision. SR: Conceptualization, Analysis, Writing-Original draft preparation. ND: Data curation, Writing-Original draft preparation. RC: Data curation, Investigation. FN: Data curation, Analysis, Writing-Original draft preparation. GA: Methodology, Data curation, Reviewing and editing final draft. GC: Reviewing and editing final draft. LS: Conceptualization, Methodology, and overall supervision. MZ: Data curation and overall supervision. PJG: Data curation, Reviewing and editing final draft. AS: Conceptualization, Methodology, Analysis, Writing-Original draft preparation and overall supervision

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