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REVIEW ARTICLE

Organ Donation Process for Transplantation: A Scoping Review

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ABSTRACT

Objectives: To identify studies in the literature that address the strategies used in the organ donation process. **Method:** Scoping review based on the Joanna Briggs Institute (JBI) methodology, in the databases Medical Literature and Retrieval System Online (MEDLINE), Scopus, Web of Science, Latin American and Caribbean Literature in Health Sciences (LILACS), and Embase via the Virtual Health Library (VHL), following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) checklist, carried out from August to December 2023. **Results:** Thirty-three studies were eligible, which showed that the donation process must happen systematically, following the steps: 1) identification of patients suspected of having brain death (BD); 2) opening the protocol and notifying organizations; 3) confirmation of the diagnosis of BD; 4) communicating the death to the family; 5) conducting the interview; 6) consent to donation; 7) donor maintenance; 8) procurement and allocation of organs; 9) transplant; and 10) follow-up. **Conclusion:** Donation requires a multifaceted approach, including awareness, investment, evaluation and research.

Descriptors: Brain Death; Donor Selection; Tissue and Organ Donors; Donations.

Processo de Doação de Órgãos para Transplante: Revisão de Escopo

Objetivos: Identificar na literatura estudos que abordem as estratégias utilizadas no processo de doação de órgãos. **Métodos:** Revisão de escopo baseada na metodologia Joanna Briggs Institute (JBI) nas bases de dados Medical Literature and Retrieval System Online (MEDLINE), Scopus, Web of Science, Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS) e Embase via Biblioteca Virtual de Saúde (BVS), seguindo o *checklist* Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR), realizada de agosto a dezembro de 2023. **Resultados:** Foram elegíveis 33 estudos, os quais evidenciaram que o processo de doação deve ocorrer de forma sistemática, seguindo as seguintes etapas: 1) identificação de pacientes com suspeita de morte encefálica (ME); 2) abertura do protocolo e notificação às organizações; 3) confirmação do diagnóstico de ME; 4) comunicação da morte à família; 5) realização da entrevista; 6) consentimento para doação; 7) manutenção do doador; 8) captação e alocação dos órgãos; 9) transplante; e 10) acompanhamento. **Conclusão:** A doação exige uma abordagem multifacetada, incluindo conscientização, investimento, avaliação e pesquisa.

Descritores: Morte Encefálica; Seleção de Doador; Doadores de Tecidos e Órgãos; Doações.

INTRODUCTION

The need for organ donation is growing in Brazil and around the world, but there is still an imbalance between the number of donors and the number of people on the waiting list[1]. Organ donation can currently be performed by a living donor, by circulatory death or by brain death (BD)[2].

Regarding the number of effective donors per million population (pmp), the United States is in first place, with 41.6 pmp, Spain in second, with 40.8 pmp and, in third, Iceland, with 36.7 pmp. Brazil is in 24th place, with 13.8 pmp. According to the World Health Organization (WHO), more than 139 thousand transplants were performed in 2023 worldwide[3].

The laws regulating organ donation and transplantation may differ regarding consent, management and control of waiting lists in certain countries. Regarding consent, countries such as Brazil, the United States, Canada, the United Kingdom, Germany and Japan adopt explicit consent, i.e., family members must authorize organ donation. In Spain, France, Italy, Portugal and Belgium, consent is presumed, i.e., every citizen is an organ donor, unless there is any statement to the contrary in an official document while the person is still alive[4].

The WHO chose the Spanish organ donation and transplantation model as a world reference due to its efficiency, awareness of society and continuous improvement of professionals who work in all stages of the process. In addition, it has a Quality Assurance Program that aims to constantly evaluate the entire donation process, becoming an example for many countries, including Brazil[4].

Although the required number of transplants has not yet been achieved, donation and transplant rates are projected to be positive in the coming years. Achieving this goal requires a joint effort from all those involved in the process, with measures for financing, organization, public policies and research[3].

Thus, research on organ donation is paramount due to the significant benefits this practice can offer public and individual health. Research in this field allows for advancing scientific knowledge about organ donation, transplantation, and acceptance processes, contributing to improving medical and surgical protocols. By better understanding the factors that influence donation rates and people's attitudes toward organ donation, researchers can develop more effective strategies to promote donation.

A preliminary search of the PROSPERO, Medical Literature and Retrieval System Online (MEDLINE), and Joanna Briggs Institute (JBI) Evidence Synthesis databases did not reveal any reviews covering this study's specific focus, either completed or in progress. Given this gap in the literature, this article aims to identify studies that address the strategies used in the organ donation process.

METHODS

The present is a scoping review as recommended by the JBI. A scoping review is a form of knowledge synthesis that addresses a research question and allows mapping of key concepts, types of evidence and gaps related to an area, in addition to conducting analyses of primary studies with the potential to develop new research strategies for the problem discussed[5]. The research protocol was registered on the Open Science Framework (OSF) platform, with identification https://doi.org/10.17605/OSF.IO/B2DN4. The recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR)[6] checklist were also considered.

The five steps recommended by the JBI were adopted in conducting this scoping review: identification of the research question, search for relevant studies, selection of studies, data mapping and grouping, summarizing, and presenting the results. The PCC (Population, Concept, and Context) strategy was used to formulate the research question, with P being adult donors in BD, C being strategies used in the organ donation process, and C being healthcare institutions. To guide the scoping review, the following research question was formulated: what strategies are used in the organ donation process by adult donors in BD in healthcare institutions? It should be noted that adults over 18 years of age were considered.

The article search process was carried out from August to December 2023 in the databases MEDLINE via PubMed, Scopus (Elsevier), Web of Science (Clarivate), Latin American and Caribbean Literature in Health Sciences (LILACS) and Embase via Biblioteca Virtual de Saúde (BVS). Regarding gray literature, publications from Google Scholar were used.

The review included publications with varied methodologies, published from 2019 to 2023, in Portuguese, English and Spanish, so it would be possible to present current literature on the subject since there have been essential updates in DB legislation and protocols. In addition, texts published by national and international bodies related to the topic and existing legislation were included. Theses, dissertations, ordinances, opinion articles, editorials, books, documents and abstracts of seminars, congresses, courses and those not available in full were excluded. Table 1 presents the search strategy.The results obtained in the databases were exported to the Rayyan reference manager to remove duplicates and select and screen the studies. The articles selected in each database were imported in BibTex file format. The data selection process was performed independently through double-checking using Microsoft Excel spreadsheets.

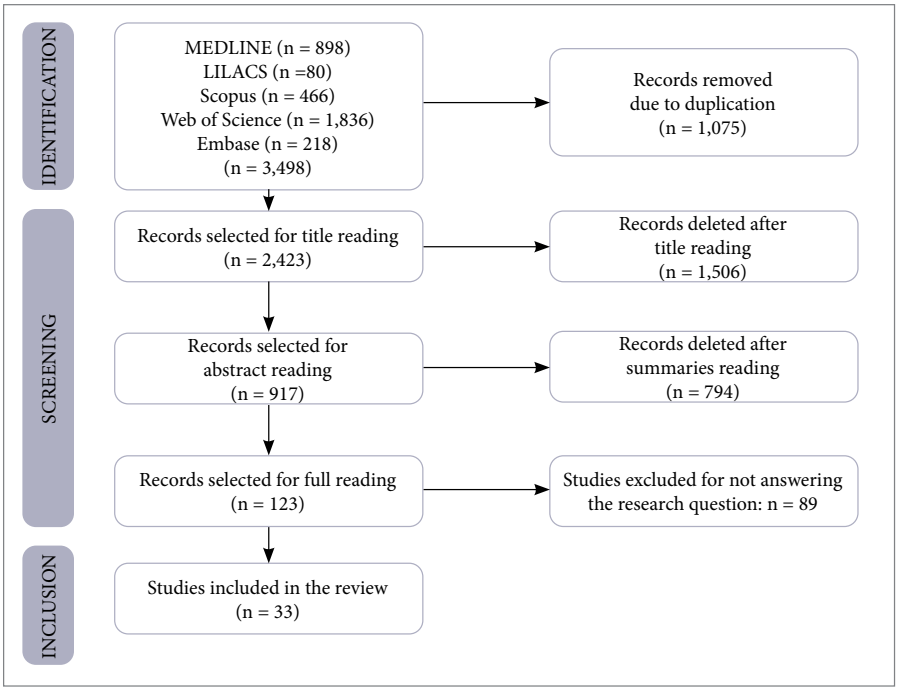
Table 1. Descriptors used to operationalize the search, Juiz de Fora, state of Minas Gerais, Brazil, 2023.

Source	Strategy	Articles (n)
MEDLINE (via PubMed)	(((("Transplant Donors"[Title/Abstract] OR "donor transplant"[Title/Abstract] OR "donors transplant"[Title/Abstract] OR "Transplant Donor"[Title/Abstract] OR "Donor"[Title/Abstract] OR "Donors"[Title/Abstract] OR "Organ Donors"[Title/Abstract] OR "donor organ"[Title/Abstract] OR "donors organs"[Title/Abstract] OR "Organ Donor"[Title/Abstract]) AND ("Tissue and Organ Procurement"[MeSH Terms] OR "Organ Procurement"[Title/Abstract] OR "Organ Procurements"[Title/Abstract] OR "Organ Procurement Systems"[Title/Abstract] OR "Organ Procurement System"[Title/Abstract] OR "Organ Shortage"[Title/Abstract] OR "Required Request"[Title/Abstract] OR "Organ Donation"[Title/Abstract] OR "Organ Donations"[Title/Abstract] OR "Donor Cards"[Title/Abstract] OR "Donor Card"[Title/Abstract])) OR ("Brain Death"[MeSH Terms] OR "death brain"[Title/Abstract] OR "Brain Dead"[Title/Abstract] OR "Coma Depasse"[Title/Abstract] OR "Irreversible Coma"[Title/Abstract] OR "coma irreversible"[Title/Abstract])) AND ("Donor Selection"[MeSH Terms] OR "selection donor"[Title/Abstract] OR "Donor Screening"[Title/Abstract] OR "Donor Screenings"[Title/Abstract] OR "Donor Exclusion"[Title/Abstract] OR "Donor Exclusions"[Title/Abstract])) AND (2019:2023[pdat])	898
LILACS (via BVS)	("Transplant Donors" OR "Donor, Transplant" OR "Donors, Transplant" OR "Transplant Donor" OR "Donor" OR "Donors" OR "Organ Donors" OR "Donor, Organ" OR "Donors, Organs" OR "Organ Donor") AND ("Tissue and Organ Procurement" OR "Organ Procurement" OR "Organ Procurements" OR "Organ Procurement Systems" OR "Organ Procurement System" OR "Organ Shortage" OR "Required Organ Donation Request" OR "Required Request" OR "Required Requests" OR "Organ Donation" OR "Organ Donations" OR "Donor Cards" OR "Donor Card") OR ("Brain Death" OR "Death, Brain" OR "Brain Dead" OR "Brain Deads" OR "Coma Depasse" OR "Irreversible Coma" OR "Coma, Irreversible") AND ("Donor Selection" OR "Selection, Donor" OR "Donor Screening" OR "Donor Screenings" OR "Tissue and Organ Selection" OR "Donor Exclusion" OR "Donor Exclusions")	80
Scopus	(TITLE-ABS-KEY ("Transplant Donors" OR "Donor, Transplant" OR "Donors, Transplant" OR "Transplant Donor" OR "Donor" OR "Donors" OR "Organ Donors" OR "Donor, Organ" OR "Donors, Organs" OR "Organ Donor") AND TITLE-ABS-KEY ("Tissue and Organ Procurement" OR "Organ Procurement" OR "Organ Procurements" OR "Organ Procurement Systems" OR "Organ Procurement System" OR "Organ Shortage" OR "Required Organ Donation Request" OR "Required Request" OR "Required Requests" OR "Organ Donation" OR "Organ Donations" OR "Donor Cards" OR "Donor Card") OR TITLE-ABS-KEY ("Brain Death" OR "Death, Brain" OR "Brain Dead" OR "Brain Deads" OR "Coma Depasse" OR "Irreversible Coma" OR "Coma, Irreversible") AND TITLE-ABS-KEY ("Donor Selection" OR "Selection, Donor" OR "Donor Screening" OR "Donor Screenings" OR "Tissue and Organ Selection" OR "Donor Exclusion" OR "Donor Exclusions")) AND PUBYEAR > 2018 AND PUBYEAR < 2024	466
Web of Science	"Transplant Donors" OR "Donor, Transplant" OR "Donors, Transplant" OR "Transplant Donor" OR "Donor" OR "Donors" OR "Organ Donors" OR "Donor, Organ" OR "Donors, Organs" OR "Organ Donor" (All Fields) and "Tissue and Organ Procurement" OR "Organ Procurement" OR "Organ Procurements" OR "Organ Procurement Systems" OR "Organ Procurement System" OR "Organ Shortage" OR "Required Organ Donation Request" OR "Required Request" OR "Required Requests" OR "Organ Donation" OR "Organ Donations" OR "Donor Cards" OR "Donor Card" (All Fields) or "Brain Death" OR "Death, Brain" OR "Brain Dead" OR "Brain Deads" OR "Coma Depasse" OR "Irreversible Coma" OR "Coma, Irreversible" (All Fields) and "Donor Selection" OR "Selection, Donor" OR "Donor Screening" OR "Donor Screenings" OR "Tissue and Organ Selection" OR "Donor Exclusion" OR "Donor Exclusions" (AllFields) and 2019 or 2020 or 2021 or 2022 or 2023 (Publication Years) and Open Access	1.836
Embase	(('transplant donors' OR 'donor, transplant' OR 'donors, transplant' OR 'transplant donor' OR 'donor' OR 'donors' OR 'organ donors' OR 'donor, organ' OR 'donors, organs' OR 'organ donor') AND ('tissue and organ procurement' OR 'organ procurement' OR 'organ procurements' OR 'organ procurement systems' OR 'organ procurement system' OR 'organ shortage' OR 'required organ donation request' OR 'required request' OR 'required requests' OR 'organ donation' OR 'organ donations' OR 'donor cards' OR 'donor card') OR 'brain death' OR 'death, brain' OR 'brain dead' OR 'brain deads' OR 'coma depasse' OR 'irreversible coma' OR 'coma, irreversible') AND ('donor selection' OR 'selection, donor' OR 'donor screening' OR 'donor screenings' OR 'tissue and organ selection' OR 'donor exclusion' OR 'donor exclusions')	218

Source: Elaborated by the authors.

RESULTS

The search strategy resulted in 3,498 publications. After removing duplicates, 2,423 studies remained for reading the titles. Based on the titles, 1,506 studies were excluded, leaving 917 to read the titles and abstracts. After reading the abstracts, 123 were read in full and assessed for eligibility. Of these, 89 studies were excluded because they did not answer the research question. Thus, 33 studies were included in the review synthesis. Figure 1 shows the flowchart of the selection process of the publications included in this review.



Source: Adapted from PRISMA-ScR.

Figure 1. PRISMA-ScR flowchart for publication selection, Juiz de Fora, state of Minas Gerais, Brazil, 2023.

An adaptation of the form recommended by JBI was used for data extraction to facilitate the synthesis of information and recommendations[5]. The following variables were collected for extraction: publication data (title, year, authors, database, and country of publication); study objectives; methodological characteristics (type of study/design, instruments and/or data production techniques, participants and/or sample); and main results (measurement of outcomes and main findings or contributions).

All researchers selected studies and read at all stages of this review to avoid undue exclusions. In case of disagreement, the researchers discussed the issue to reach a consensus and ensure resolution. Since this is a scoping review using public data, submission to the Research Ethics Committee (REC) was unnecessary.

Table 2 shows the 33 studies published from 2019 to 2023 that comprised the final research sample. Of the studies found, regarding the year of the study, 12 (35%) were published in 2021, eight (24%) in 2020, six (18%) in 2023, six (18%) in 2019 and two (5%) in 2022. Regarding the type of study, it was observed that 10 (30%) were quantitative studies, seven (21%) qualitative, five (15%) expert consensus, three (9%) scoping reviews and three (9%) review articles, both types: two (6%) integrative reviews, two (6%) systematic reviews and one experimental study (3%), in addition to one randomized controlled study.

The majority of studies were published in Brazil, Canada and the United States (19; 55%), with three publications in Spain (9%) and three in India (9%), two in the Netherlands (6%) and one each in Australia, Iran, South Korea, Israel, Taiwan and China.

The evidence selected for this review was analyzed through repeated readings and observing relevant and similar information. This scoping review made it possible to map the strategies used by various countries in the organ donation process and suggest and recommend ways to increase the number of effective donors.

Table 2. Characterization of articles included in the review, Juiz de Fora, state of Minas Gerais, Brazil, 2023.

ID	Country	Design	Main results
A1	Canada	Expert consensus	Describes twelve recommendations related to the requirements for donation consent, organ allocation, the structure of the bodies responsible for the donation process and disclosure to society.
A2	USA	Expert consensus	It brings 14 recommendations to achieve equity and improve organ donation and transplant system performance.
A3	USA	Expert consensus	Describes the importance of robust scientific research.
A4	Canada	Scoping review	Describes the importance of quality tools to improve organ donation.
A5	India	Qualitative exploratory study	It highlights the need for public awareness campaigns to remove the stigmas related to donation.
A6	Iran	Quantitative retrospective study	It highlights the need for training professionals to improve the effectiveness of family interviews.
A7	Israel	Cross-sectional study	It highlights the need for society to be aware of organ donation.
A8	Canada	Retrospective cohort study	Reports that policies, legislation and best practices can facilitate potential donor identification and approach.
A9	Spain	Quantitative retrospective study	It highlights factors that can be improved to increase the number of donors, such as the quality of care and the experience of the professional conducting the donation interview.
A10	Brazil	Review article	Reports the importance of raising awareness among the population about the diagnosis of BD.
A11	Australia	Scoping review	It suggests the need for participation by the population and health professionals in discussions about the BD concept.
A12	Brazil	Integrative review	It highlights the need to know the patient's hospitalization history and their emotional support; the team must master the stages of mourning and provide information about the donation, understanding the phases of the donation process and respecting the family's time.
A13	Canada	Scoping review	It raises the importance of incorporating organ donation into institutions and society.
A14	Brazil	Ecological study	It demonstrates a growing trend of potential and effective donors throughout Brazil, emphasizing the South Region.
A15	USA	Quantitative study of spatial analysis	It shows that organ procurement organizations' (OPO) performance is associated with geographical relationships.
A16	Canada	Experimental study	Shows that marketing solutions can increase organ donor registrations.
A17	Canada	Qualitative study	It shows that the need for positive language, redefining the roles of professionals and increasing education are strategies that can reduce family refusal to donate organs.
A18	South Korea	Review article	It shows that the ideal management of donor organs is vital for the transplant results.
A19	USA	Review article	It highlights the need for appropriate policies, standardized guidelines for donors and recipients, and educational initiatives to ensure global awareness.
A20	Taiwan	Qualitative research	It reinforces the importance of introducing the topic of organ donation in educational institutions.
A21	USA	Systematic review	It highlights the importance of researching preservation solutions to increase donations.
A22	USA	Expert consensus	It recommends standardization of screening of potential donors and the family approach.
A23	Brazil	Cross-sectional study	Shows that successful organ donation is associated with a short time interval between the first and second clinical examinations of BD.
A24	Brazil	Expert consensus	It develops 19 recommendations to standardize the management of donors with BD.
A25	Spain	Qualitative phenomenological study	It shows that the organ donation process requires specialized training to avoid organizational barriers.
A26	Spain	Cross-sectional study	It concludes that training is necessary to improve professionals' health and emotional management.
A27	Brazil	Integrative review	It reports that family members' lack of knowledge about BD can lead to family refusal.
A28	Europe	Retrospective study	They assessed that more proactive strategies for detecting donors with BD significantly increase the number of donors.
A29	China	Qualitative research	Reports that social media campaigns have the potential to promote organ donation.
A30	Brazil	Randomized controlled trial	Screening potential organ donors using an evidence-based checklist can reduce donation loss.
A31	India	Qualitative study	It highlights that raising public awareness can further strengthen and improve the program's reach.
A32	Netherlands	Observational study	It shows that the family's understanding of BD can positively influence consent rates.
A33	India	Cross-sectional study	It highlights the importance of informing the population about organ donation.

Fonte: Elaborada pelos autores.

DISCUSSION

Organ donor selection should occur systematically, following the following steps: 1) identification of patients with suspected BD; 2) opening of the protocol and notification to organizations; 3) confirmation of the BD diagnosis; 4) communication of the death to the family; 5) conducting the interview; 6) consent for donation; 7) maintenance of the donor; 8) harvesting and allocation of organs; 9) transplantation; and 10) monitoring[1,33].

According to the Global Observatory on Donation and Transplantation (GODT), donation after BD is the main form of organ donation in Brazil and worldwide. Studies have highlighted the need for broader awareness among the population about the diagnosis of BD, aiming to remove stigmas and mistrust in the donation process[1-3,10,11,18,23,24,27,28,30].

Regarding BD, the need for an active search for potential donors was highlighted in addition to raising awareness. In other words, professionals who work directly with the donation and transplant process must actively search for donors in intensive care units[1-3,10,11,18,23,24,27,28,30].

The organ donor with BD is a clinically complex patient who presents many clinical management challenges. Therefore, each donor must be meticulously managed to save as many recipient lives as possible. Management should be focused on optimizing organ function, achieving optimal homeostasis for each organ, and avoiding instability in the potential donor. It is important to emphasize that the diagnosis of BD is a patient's right and should be made regardless of organ donation[1-3,10,11,18,23,24,27,28,30].

Another critical moment in the organ donation process is the family interview; this is when the family decides whether or not to consent to the donation, and the family's decision is essential for the continuation of the process. It is an opportunity to transform the tragedy of the loss of a family member into the noble act of donation, capable of alleviating suffering[1-3,5,8,9,12,20,22,31,33].

In this context, family refusal has been identified as one of the most critical limiting factors in the donation process, regardless of the consent system in each country. It is recommended that the professional conducting the interview has competence, skill and knowledge of the stages of the donation process, in addition to clear and straightforward communication according to the needs of each family[1-3,5,8,9,12,20,22,31-33].

Knowing the donor's wishes while alive was also highlighted, as this would facilitate the family's consent. Therefore, organ donation must be widely discussed in society and the media to generate public engagement and in-depth discussions. Given the above, donor selection requires a multifaceted approach, including education, awareness, public trust, investment, ongoing evaluation and research[1-3,5,8,9,12,16,20,29,31-33].

Study limitations

Despite the above, this study has a limitation in that the organ donation process encompasses numerous stages. However, the studies address these stages independently, without considering their association. Future studies are recommended so that pieces of evidence can be addressed concomitantly. Although this study highlighted several areas for improvement and challenges to overcome, such as the need for a more integrated approach to the stages of the donation process, it provides a solid basis for future investigations and improved clinical practices. Ultimately, a joint and continuous effort is needed to ensure that the potential of donors is fully utilized, thus allowing more lives to be saved through organ transplantation.

CONCLUSION

This review's findings showed that the transplantation donation process must be transparent, respect all ethical aspects, and guarantee society the effectiveness and credibility of all stages until the donation and transplant process are completed.

It was also observed that professional training in the stages of the organ donation process and raising awareness in society, especially regarding the diagnosis of BD, are needed to reduce waiting lists.

The study strengthens knowledge on the subject and points out actions to improve the donation process for the different transplant programs in Brazil and worldwide. As the donation scenario evolves, recommendations, guidelines, and strategies must be reconsidered and updated to develop research, technology, and practice. Therefore, the relevance of this review for health systems and services is highlighted, providing support to improve actions to advance knowledge and improve clinical practices related to organ donation.

CONFLICT OF INTEREST

Nothing to declare.

AUTHOR'S CONTRIBUTION

Substantive scientific and intellectual contributions to the study: Silva TR, Bastos RR, Emidio SCD, Carbogim FC, Braz PR; **Conception and design:** Silva TR, Bastos RR, Emidio SCD, Carbogim FC, Braz PR; **Data analysis and interpretation:** Silva TR, Bastos RR, Emidio SCD; **Article writing:** Silva TR, Braz PR; **Critical revision:** Bastos RR, Emidio SCD; **Final approval:** Bastos RR.

DATA AVAILABILITY STATEMENT

All dataset were generated or analyzed in the current study.

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