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Original Article

Knowledge of undergraduate health students regarding blood donation

Conhecimentos de estudantes de cursos da área da saúde em relação à doação de sangue

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ABSTRACT

Objective: to understand the knowledge of undergraduate health students regarding blood donation. **Methods:** this was a qualitative, interpretative study conducted with a purposive sample of 42 students. Semi-structured interviews were transcribed and analyzed using the *Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires* software via Descending Hierarchical Classification. The analysis was grounded in lexical analysis and thematic-categorical content analysis, within the framework of Self-Determination Theory. **Results:** a total of 146 text segments were analyzed, achieving a retention rate of 68.49% and yielding five thematic classes. The study evidenced emotional, informational, and structural barriers to donation, as well as the persistence of myths regarding eligibility criteria. Motivations were associated with personal and family experiences and altruistic values, while benefits were recognized for both donors and recipients, emphasizing the humanitarian and social character of donation. **Conclusion:** students demonstrated significant knowledge gaps regarding eligibility criteria, ineligibility factors, and practical aspects of the donation process. **Contributions to practice:** this study informs the planning of educational and formative actions aimed at raising awareness and increasing the number of regular donors.

Descriptors: Blood Donation; Knowledge; Students, Health Occupations.

RESUMO

Objetivo: compreender os conhecimentos de estudantes de cursos de graduação na área da saúde em relação à doação de sangue. **Métodos:** pesquisa qualitativa, de natureza interpretativa, realizada com amostra intencional de 42 estudantes. As entrevistas semiestruturadas foram transcritas e analisadas pelo *software Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires*, por meio da Classificação Hierárquica Descendente, fundamentada na análise lexical e de conteúdo temático-categorial, à luz da Teoria da Autodeterminação. **Resultados:** foram analisados 146 segmentos de texto, com aproveitamento de 68,49%, originando cinco classes temáticas. Evidenciaram-se barreiras emocionais, informacionais e estruturais à doação, bem como a presença de mitos sobre critérios de elegibilidade. As motivações estiveram associadas a experiências pessoais e familiares e a valores altruístas, enquanto os benefícios foram reconhecidos tanto para doadores quanto para receptores, com ênfase no caráter humanitário e social da doação. **Conclusão:** constatou-se que os estudantes apresentam lacunas significativas de conhecimento acerca dos critérios de elegibilidade, inaptidão e aspectos práticos do processo de doação. **Contribuições para a prática:** o estudo subsidia o planejamento de ações educativas e formativas voltadas à sensibilização e à ampliação do número de doadores regulares.

Descritores: Doação de Sangue; Conhecimento; Estudantes de Ciências da Saúde.

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Introduction

Blood is essential for care in urgencies and emergencies, major surgeries, chronic disease treatments, and the production of plasma-derived medicines[1]. However, in Brazil, the only method of obtaining blood is through voluntary donation. The World Health Organization (WHO) recommends that 1% to 3% of the population donate blood regularly to ensure a safe and resilient health system[2].

However, adherence to blood donation is frequently impacted by misinformation. The persistence of myths and beliefs about the process highlights difficulties in accessing reliable information. This is compounded by limited understanding of technical eligibility criteria, such as age, minimum weight, donation intervals, and clinical conditions for aptitude[3].

In this context, continuing education stands out as a fundamental strategy for addressing misinformation related to blood donation among students and health professionals. Undergraduate health students occupy a central position in this process, as they are future professionals responsible for promoting evidence-based educational practices regarding this and other relevant public health themes.

When adequately guided during academic training, these students develop an understanding of hemotherapy and the social relevance of blood donation. This preparation contributes to strengthening health education competencies and consolidating favorable attitudes toward donation, thereby expanding engagement in community awareness actions[1].

Despite the relevance of this strategic group, the literature reveals gaps regarding the systematic evaluation of health students' knowledge about blood donation. Specifically, there is a lack of research identifying informational and socio-emotional weaknesses that may compromise their role as multipliers and blood donors, particularly in the Brazilian context. This highlights the need for qualitative investigations to deepen the understanding of these perceptions[3].

Given this, this study presents a novel contribution by analyzing the knowledge of health students regarding blood donation, interpreted through the lens of Self-Determination Theory (SDT)[4], allowing for reflection on intention and behavior regarding the theme. The research was guided by the question: What knowledge do health course students possess regarding blood donation?

Thus, the objective was to understand the knowledge of undergraduate health students regarding blood donation.

Methods

Study type

This is a qualitative, interpretative research study that understands phenomena based on meanings attributed by subjects. It is grounded in the theoretical framework of SDT[4] and methodologically anchored in lexical analysis[5] and thematic-categorical content analysis[6].

The research was conducted at the University of Pernambuco, Petrolina campus, in Northeastern Brazil, with students regularly enrolled in undergraduate Nursing, Nutrition, and Physiotherapy courses. The selection of courses was based on institutional convenience, considering the available empirical field, and their strategic relevance to the theme, as these future professionals act directly in health promotion and education, serving as potential information multipliers regarding blood donation.

The study was prepared in accordance with the Consolidated Criteria for Reporting Qualitative Research (COREQ) recommendations.

Population and sample

Inclusion criteria were defined as regularly enrolled students over 18 years of age. Exclusion criteria included students who had suspended or canceled

their enrollment during the data collection period, or those with infrequent class attendance (absence percentage greater than 25%).

The non-probabilistic intentional convenience sample consisted of 42 students who agreed to participate and signed the Informed Consent Form. This sampling method was adopted due to student accessibility in the academic environment and the explanatory nature of the study.

The final sample size was determined by the principle of data saturation, defined as the point at which the inclusion of new participants ceased to add relevant units of meaning (UM) to the investigated phenomenon[7]. To monitor this process, emerging categories were systematically registered after each set of interviews to verify content recurrence and redundancy. Saturation was considered achieved when, after the 38th interview, no new information, concepts, or relevant variations expanding the understanding of the object of study were identified. Four additional interviews were conducted for confirmation. Thus, the total number of participants was sufficient to ensure depth, consistency, and analytical variability in the data.

Instrument and data collection

Data collection occurred from December 2024 to June 2025 through semi-structured interviews. These were conducted by Nursing undergraduates previously trained in the Study and Research Group on Theories and Practices of the Care Process, under the direct supervision of doctoral researchers to ensure procedural standardization and script adherence. The interviewers had no hierarchical or evaluative relationship with participants, reducing potential social desirability biases.

Prior to definitive collection, a pilot study was conducted with 12 participants to test the clarity, sequence, and operability of questions. This resulted in minor linguistic adjustments to the instrument, which was constructed based on literature regarding scales and methods for assessing blood donation knowledge[8] and an international survey[9], and reviewed by two specialists in hemotherapy and health education.

Participants were contacted by researchers and invited to participate. Subsequently, the interview day, time, and location were scheduled according to participant availability and interest.

The study used a script composed of 22 questions. Questions 1 to 9 covered sociodemographic information to characterize the participant profile. Questions 10 to 22 were open-ended, aimed at understanding students' knowledge, perceptions, and experiences regarding blood donation, including donation history, motivations, attributed importance, eligibility criteria, barriers, and information sources.

Interviews were recorded using a smartphone voice recording tool, with participant authorization following clarification of research objectives and signing of the Informed Consent Form. Recordings took place in silent, reserved rooms on campus to ensure privacy.

The average duration of approximately 11 minutes proved methodologically adequate, considering the study focus and the semi-structured script. The open and focused questions produced empirical material with sufficient density to support the analytical processes adopted.

Subsequently, interviews were archived in .mp4 format and transcribed into Google Docs. Transcriptions were performed in full and subjected to rigorous quality control, with independent double-checking to ensure fidelity between audio and textual material. As an additional validation strategy, participants were invited to listen to their respective recordings if desired, enabling content verification and confirmation of information accuracy.

To ensure anonymity, fictitious codes were assigned to respondents: the letter "I" (for interview) followed by the course name and a number corresponding to the chronological order of the interview (e.g., I1 identifies the first interview, while I42 corresponds to the last).

Data analysis

Data analysis was conducted in an integrated manner, articulating lexicometric procedures with thematic-categorical content analysis. This contemplated the phases of pre-analysis, material exploration, treatment of results, inference, and interpretation. This approach allowed for the refinement of analytical categories by naming classes generated by the software's lexicographic analysis, ensuring theoretical-interpretative coherence and depth in understanding the investigated phenomenon considering Self-Determination Theory[4].

For each interview transcription, floating reading (preliminary reading) and initial analytical notes were performed to capture main emerging ideas. Subsequently, all responses were compiled into a single document, forming the *corpus* for analysis. Before processing, the *corpus* underwent treatment, including spelling standardization, compound word recognition, and removal of stopwords and non-linguistic elements such as onomatopoeias and interjections.

The software *Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires* (IRAMUTEQ), version 0.7 alpha 2, was used to perform textual statistical analyses, adopting Descending Hierarchical Classification (DHC). This analytical procedure applies an iterative classification of text segments (TS). The software transformed text units (TU) into TS according to standard parameters, considering TS with a minimum of 40 characters eligible for classification.

TS without relevant semantic content or sufficient lexical density were excluded. The number of classes was defined automatically by the statistical criterion maximizing lexical differentiation between groups; term-class association was considered significant when $p<0.05$ using the Chi-square test.

Class interpretation was based on pertinent literature and the theoretical framework of Self-Determination Theory[4]. The interpretative process was conducted independently by two doctoral researchers with qualitative analysis experience from the responsible research group. Divergences were resolved by consensus to ensure rigor and reliability.

Ethical aspects

This study was approved by the Research Ethics Committee involving human subjects of the *Centro Universitário Integrado de Saúde-Amaury de Medeiros* (Certificate of Presentation for Ethical Appreciation 73901123.8.0000.5191, opinion number: 6,300,535/2023), respecting the ethical aspects of Resolution No. 466/12.

Results

The thematic *corpus* comprised 42 texts, totaling 146 TS. After removing definite/indefinite articles and onomatopoeias, 68.49% of segments were classified, an index considered satisfactory for lexicographic analyses. Active forms were considered for inclusion in the results. The software organized classes into two blocks, three subcorpora, and five classes, presented graphically in a dendrogram (Figure 1), read from left to right.

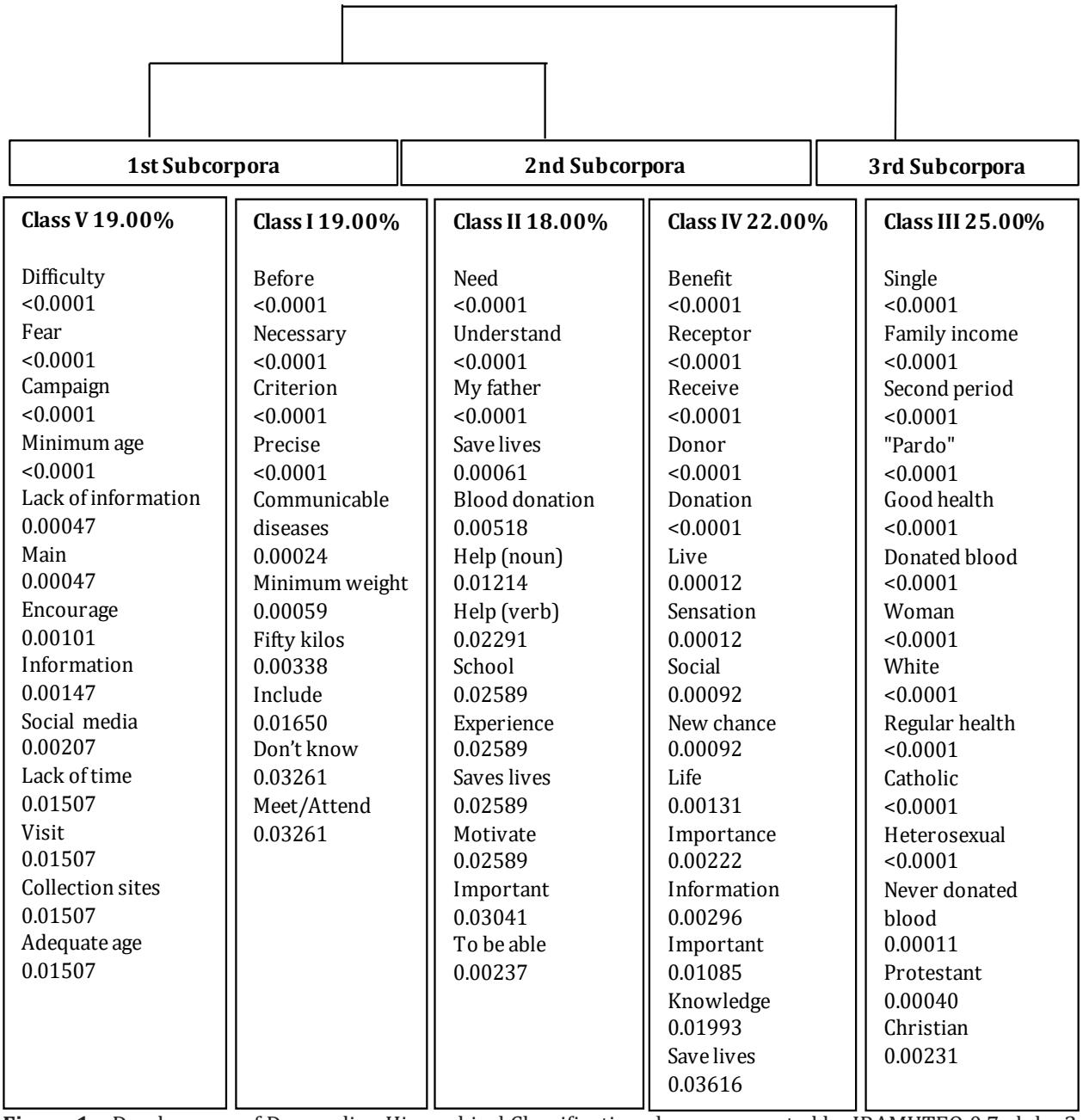

Figure 1 – Dendrogram of Descending Hierarchical Classification classes generated by IRAMUTEQ 0.7 alpha 2. Petrolina, PE, Brazil, 2025

Class 5 – Barriers to donation

In this class, results indicate that when the understanding of technical criteria is permeated by imprecise information, these criteria are subjectively perceived as barriers, generating insecurity and deterring the practice of donation. Thus, the mistaken interpretation of technical and normative criteria acts as a barrier.

Terms such as "difficulty," "fear," and "lack of information" appear as barriers, revealing emotional, structural, and psychosocial aspects that interfere with the motivation, intention, and decision to donate. These were interpretatively categorized into emotio-

nal, informational, and structural barriers, which are frequently interrelated and mutually reinforcing.

Emotional barriers emerged recurrently in statements, especially associated with fear and insecurity regarding the donation procedure. Fear of needles and potential unpleasant consequences inhibits the decision to donate, often sustained by exaggerated or imprecise perceptions of the process. These feelings are reinforced by a lack of prior experience and the circulation of negative reports in the social imaginary, as illustrated by the following report: *...I am terrified of the needle, nobody knows, thinks the needle is huge and says they won't donate because they are scared to death of the needle.* (I18 – Physiotherapy).

Furthermore, donation is sometimes perceived as an uncomfortable or emotionally and physically burdensome experience, associated with wasted time or excessive effort, contributing to the postponement or abandonment of the intention to donate.

Informational barriers concern the lack of clear, reliable knowledge about the donation process and eligibility criteria. Incomplete or mistaken information favors the construction of myths and distorted understandings, causing technical criteria to be perceived as impediments. Insecurity regarding one's health conditions, combined with difficulty accessing reliable information, generates doubts that deter potential donors, as exemplified in the excerpt: *I believe there is a lot of false information about it, which makes this knowledge difficult...* (I40 – Nutrition).

The absence of systematized and accessible guidelines contributes to persisting ignorance, reinforcing fears and incoherent perceptions about blood donation.

Structural barriers relate to practical and organizational aspects hindering access to hemotherapy services. Lack of time, distance from collection points, and the perceived insufficiency of suitable locations were frequently mentioned. Such factors make donating less viable in students' daily lives, particularly given academic demands: *The issue of thinking it is a waste of time, often it is in the rush of the university...* (I4 – Nursing).

Participants recognized that strategies such as continuous information campaigns, use of social media, and expansion of collection points—including articulation with Basic Health Units—could minimize these difficulties, improve access, and reduce identified obstacles. Overall, this class evidence that while students recognize the social importance of blood donation, the simultaneous presence of barriers limits its realization. These findings reinforce the need for accessible, regular educational actions and the transversal insertion of blood donation themes into academic curricula, contributing to critical training engaged with health, well-being, and system sustainability, in consonance with Sustainable Development Goals (SDGs).

Class 1 – Criteria and prerequisites for donation

This class gathers students' knowledge and gaps regarding technical and normative criteria for blood donation, evidencing both correct and mistaken ideas related to minimum weight, health conditions, intervals, and screening procedures.

Words such as "before," "necessary," "criterion," and "precise" reveal students' concern with understanding requirements for aptitude. Among the most mentioned criteria are those related to minimum weight (frequently referred to as "fifty kilos") and communicable diseases, perceived as exclusion factors during screening.

Statements demonstrate that some students possess knowledge about objective, technical, and normative requirements: *The ones I know are not having chronic, communicable diseases, having muscle mass, your ideal weight above 50 kilos... I know that nowadays the question of sexuality does not interfere. Because you do routine exams, so you can see if you have or don't have something that will infect another person. So, what I know is that I don't know more* (I30-Physiotherapy).

However, the recurrent use of "I don't know" indicates knowledge gaps, revealing insecurity about exact values, periodicity, and factors rendering a candidate temporarily or definitively ineligible: *I only remember that you have to fast, it is... have to have an ideal weight, I think you can't have had a tattoo very recently, obviously not have any blood disease* (I7-Nursing).

This class shows that while an initial unders-

tanding of prerequisites exists, many students acknowledge incomplete mastery of the necessary information. Misconceptions, such as the myth of mandatory fasting mentioned above, further evidence these gaps. This scenario reinforces the need for consistent educational actions to build solid knowledge about blood donation criteria, especially among future health professionals who will serve as information multipliers.

Class 2 – Factors stimulating blood donation

This class includes terms related to motivational elements for blood donation. The most frequent words refer to personal and family factors ("need," "my father," "experience") and social/altruistic aspects ("save lives," "help," "motivate").

Results indicate that students recognize the importance of blood donation as a collective benefit but report that close experiences—such as a family member's need or the influence of their social circle—are determinants in awakening interest: *I already had the will to donate, I already knew about it... we made a visit to the blood center because of the course, which is part of the curriculum. And there was the opportunity there and I donated* (I24-Physiotherapy).

Terms like "understand," "school," and "important" reinforce the role of educational experiences and information access in forming consciousness about donation relevance. However, when mentions of school relate to the theme's absence in the curriculum, the need for strategies complementing formal education is evident.

In this context, university extension emerges as a crucial space to fill this gap, providing educational and practical activities that expand knowledge and sensitize future health professionals. Thus, knowledge acquired through life experiences and extension initiatives can differentiate the awareness and mobilization process: *I think I never had much incentive, whether by media, by school or in college itself, I don't know how* (I13-Nursing).

Furthermore, words like "to be able" and "help" refer to the perception of donation as an act of individual capacity with positive collective impact. Recognizing that a single donation can "save lives" reinforces the humanitarian and solidarity dimension attributed to the act.

Generally, this class shows that although many students have not directly experienced donation, they recognize its relevance and feel motivated primarily when perceiving a close need or the transformative potential of the gesture.

Class 4 – Benefits of blood donation

This class gathers discourses highlighting benefits for both donors and recipients. Terms like "benefit," "recipient," "receive," and "donor" point to a clear understanding of the solidarity relationship: while the recipient gains a "new chance" to "live," the donor experiences fulfillment and personal satisfaction.

Words like "life," "save lives," and "importance" reinforce the perception of donation as an essential, socially relevant act capable of promoting life continuity in critical situations (surgeries, accidents, severe illnesses). Donation is seen not merely as a medical procedure but as an act of solidarity and social responsibility: *I understand yes, because it is an act even of caring for the neighbor, of saving a life. In situations and emergency, it may be that one day I need it. So, it is an act of putting yourself in the other's place and understanding that you have a chance to save a life, to help someone just by the simple act of donating your blood. Yes. It is a very important thing* (I3-Nursing).

Subjective aspects emerge in terms like "sensation," "important," and "knowledge," referring to the emotional and moral impact. Many students recognize that donating blood generates a feeling of utility and duty fulfilled, strengthening citizen consciousness. Additionally, the association between "information" and "knowledge" evidence that understanding donation relevance and results functions as an additional stimulus for future health professionals' engagement. Understanding the power to save lives becomes a fundamental motivating element.

Overall, this class shows students attribute a humanitarian, social, and transformative character to

blood donation, recognizing both concrete effects on life maintenance and symbolic reflections in strengthening solidarity and citizenship.

Class 3 – Sociodemographic profile

This class gathers terms describing the participants' sociodemographic profile. There is a predominance of single, female students, primarily enrolled in the second period of the investigated courses.

Regarding race/color, "pardo" (mixed-race) and "white" were most representative. Religiously, references to "Catholic," "Evangelical," and "Christian" evidence diversity, with Catholicism being most prevalent. The predominant sexual orientation was heterosexual.

Regarding health perception, "good health" and "regular health" suggest most students consider themselves healthy, though some recognize limitations. Family income was also an expressive marker.

The expressions "donated blood" and "never donated blood" reveal mixed experiences; while some have had direct contact, a large portion has never donated, interacting with other classes regarding barriers, knowledge, and motivations.

The sociodemographic profile connects directly to students' perceptions and practices: early enrollment periods help explain the presence of myths; socioeconomic conditions may relate to practical difficulties (transport, time); health perception influences aptitude evaluation; and religious beliefs can act as both incentive and barrier.

Thus, this class evidence that statements related to blood donation are closely linked to the student profile. Individual characteristics constitute a background helping to understand practical obstacles, myths, and motivations sustaining or hindering adherence.

The sample comprised 42 students, with a mean age of 20.4 years (SD = 2.20), attending on average the 2.71st period (SD = 1.83). Participants were predominantly from Nursing, female, pardo, single, heterosexual, Catholic, with a family income between two and three minimum wages.

Discussion

The study discusses that while students recognize blood donation as socially relevant and essential for hemotherapeutic stocks, knowledge gaps and distorted perceptions persist, interfering with the predisposition to donate—a phenomenon observed in national and international research[10-11].

The marked presence of fear indicates that the decision to donate is not regulated solely by rational knowledge, but by emotional and social components compromising the satisfaction of the psychological need for autonomy, shifting motivation to more controlled, less internalized forms of behavior regulation[4]. Among health students, this manifests mainly as fear of malaise, insecurity regarding adverse reactions, and needle phobia, factors described in the literature as relevant to the decision process, particularly for the first donation[12-13].

From the Self-Determination Theory perspective, the predominance of emotional barriers suggests low levels of perceived autonomy, helping to explain why favorable attitudes do not always convert into effective behavior, even in a group with technical-scientific training[4].

Another aspect refers to practical difficulties, especially lack of time and low schedule flexibility of collection services. Health students, subject to intense academic workloads, report scarce time for displacement and donation, a reality reinforced by studies pointing to logistics as a significant determinant of non-adherence[14-15]. This study contributes originally by evidencing that logistical barriers specific to the intensive academic routine of health courses reinforce the need for institutional strategies adapted to this demographic, such as expanded hours, mobile units, and university-based campaigns[10,16].

The class regarding criteria demonstrated substantial ignorance regarding aptitude and conditions. Insufficient basic information reveals gaps needing address during training. Literature reinforces that educational interventions during undergraduate studies

favor competence consolidation and the correction of conceptual misconceptions[17].

In this sense, initiatives like the extension project "*Cuidar está no Sangue®*" (Caring is in the Blood) are relevant for promoting awareness, partnerships with blood centers, and educational technologies (e-books, self-instructional courses), contributing to filling these gaps[18-19] by articulating competence, autonomy, and relatedness to transform intention into behavior[4].

Social media emerged as an expressive factor, acting as the main information source but with a dichotomous function associated with fragmented knowledge[20]. Brief content, real narratives, and direct scheduling links have proven efficient in promoting engagement[21]. Recent studies also highlight social media's role in the adherence of Generation Z and Millennial donors during the COVID-19 pandemic[22].

Regarding stimulating factors, students reported motivations predominantly associated with support for family and close acquaintances, a behavior identified in other studies[23]. This relates to extrinsic elements of self-determination involving the basic need for relatedness[4]. However, this reactive pattern does not ensure stock stability, as it results in donations concentrated in emergencies. Guaranteeing continuous supply requires investing in retention (loyalty) through strategies such as positive donor feedback, institutional programs, and encouragement of periodic attendance[24], grounded in the triad of competence, autonomy, and relatedness[4].

The benefits class evidenced both emotional gains for donors (satisfaction, solidarity, belonging) and the perception of direct positive impact on recipients. Understanding that a single donation can save multiple lives reinforces the gesture's symbolic power and capacity to favor practice continuity[25]. Inspiring narratives and real testimonials, when incorporated into educational actions, can catalyze motivation[26-27].

Finally, the sociodemographic profile showed a predominance of single, female students from initial course periods with religious diversity. This heterogeneous profile reflects the typical composition of public university health courses and aids in understanding how sociodemographic factors influence donation perceptions and behaviors[28].

The contemporary challenge consists not only of increasing first donation rates but also creating mechanisms to ensure retention. University extension presents a potent strategy by articulating teaching, research, and service, promoting social innovation, and consolidating a culture of voluntary, conscious, regular donation[27-29]. Partnerships between educational institutions and blood centers (semi-annual campaigns, mobile posts, continuing education) can generate concrete, immediate, and measurable impacts[30].

Study limitations

The study was conducted in a single higher education institution, which may restrict findings transferability. Furthermore, individual interviews may have been influenced by social desirability bias, considering participants were health undergraduates. While participants from different courses and periods were included, the absence of comparison limits understanding of how formative maturity impacts knowledge. Multicentric studies with mixed methodologies and diversified samples can expand result robustness and transferability. Therefore, caution should be exercised in generalizing findings.

Contributions to practice

Based on these findings, educational actions should be directed at young university health students. Examples include "*Cuidar está no Sangue®*", which promotes voluntary donation and provides educational technologies to the academic community, aiming to raise awareness about public health relevance, increase regular donors, and create evidence-based information multipliers.

The extension project, developed by the authors, is an initiative registered as intellectual property (copyright and trademark) that can be adopted

by other universities and integrated into curricular extension processes and training programs for blood centers and transfusion agencies.

Conclusion

It was evidenced that Nursing, Nutrition, and Physiotherapy students possess knowledge about blood donation, but present significant gaps related to eligibility criteria, ineligibility, and practical process aspects. Emotional barriers (needle fear), cognitive barriers (ignorance of requirements), and structural barriers (lack of time, access difficulty) were identified as factors hindering adherence.

While individual or family motivations may drive the first donation, consolidating regular donors requires continuous educational strategies promoting citizenship, social responsibility, and collective engagement.

Authors' contributions

Conception and design or analysis and interpretation of data; Drafting of the manuscript or relevant critical revision of intellectual content; Final approval of the version to be published; Responsibility for all aspects of the text, ensuring the accuracy and integrity of any part of the manuscript: **Amorim AGR, Silva MES, Feitoza EFP, Carvalho LMFP, Silva RG, Teles RBA, Góis ARS**.

Data availability

The authors declare that the entire dataset is available within the body of the article. However, if necessary, data may be requested from the corresponding author.

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