



BJGH

Brazilian Journal
of Global Health

Revista Brasileira
de Saúde Global

Most common causes of unfitness of blood and hemoderivative donors according to sex

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ABSTRACT

OBJECTIVE

Blood donation in Brazil is marked by a turbulent history of decentralized hemotherapy, without efficient policies. Article 64 of Federal Law No. 10,205/2001 requires that, prior to donation, candidates undergo a confidential screening process. This step is subdivided into: registration, and clinical and serological screening. Subsequently, the donor is considered fit, or as presenting permanent or temporary unfitness. Thus, the objective was to compare the main causes of unfitness to donate blood among men and women from blood centers between 2017 and 2020.

METHODS

Observational and retrospective study, with a quantitative and qualitative approach. Tabulated information for the years 2017 to 2020 was extracted from the hemocenter database.

RESULTS

Analysis was performed by comparing the causes of unfitness, in this case the sum between men and women, between the years 2017 and 2020. Among the 5 causes of unfitness for men, 4 are repeated every year, namely: use of medication, self-medication, and/or effective need for chronic diseases; recent surgery; risky sexual intercourse; arterial hypertension. Among the 5 causes of disability for women, 4 are repeated every year: medication use; recent surgery; low hematocrit/hemoglobin; tattoo/acupuncture/ear lobe piercing.

CONCLUSIONS

When listing the main exclusion factors for donation between the sexes, it is noticeable that the causes remain constant over the years.

DESCRIPTORS

Donor Selection, Blood Donors, Sex Distribution, Hemovigilance, Observational Study.

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DOI: <https://doi.org/10.56242/globalhealth;2022;2;6;17-21>

INTRODUCTION

Blood donations in Brazil have a relatively recent history, troubled and strongly marked by capitalism. The first academic report on hemotherapy in the country was through a doctoral thesis in 1879, describing empirical experiences of blood transfusions. However, the first blood transfusion took place only in 1910, performed by the surgeon Garcez Fróes, a professor at the Salvador Medical Clinic, who transfused 129mL of blood¹.

In the beginning, transfusions were carried out arm-to-arm, in other words, blood was transfused directly from the donor to the recipient; there was no storage system, therefore, donors were summoned by blood banks only when necessary. The first blood bank in the world was created in 1937, in the United States, and in Brazil, more precisely in Porto Alegre, only in the 1940s^{1,2}.

Unlike Europe, the Brazilian transfusion system, in the beginning, was based on paid donation, thus being stamped by capitalism since blood and its derivatives began to be used as a form of therapy. The practice consisted of buying blood cheaply from donors and reselling it to hospitals at exorbitant prices, with virtually no quality control, in order to profit. Therefore, the relationship between commerce and blood led to hemotherapy losing its prestige³.

The Association of Voluntary Blood Donors (ADVS), led by Carlota Osório, rose against this practice, encouraging unpaid donation and free distribution of blood by the State to anyone in need, through the enactment of Law No. 1075, which deals with Voluntary Blood Donation⁴.

Later, the National Blood and Hemocomponents Program (Pró-Sangue) was created in 1980, with the aim of regularizing the situation of Brazilian hemotherapy, after which the Hematology and Hemotherapy Centers, the so-called hemocenters, appeared, thus ending the blood trade. In the same year, the Volunteer Donation Campaign of the Brazilian Society of Hematology and Hemotherapy (SBHH) took place, which after the merger with the Brazilian College of Hematology (CBH), became the Brazilian Association of Hematology, Hemotherapy and Cell Therapy (ABHH), which today has more than 4 thousand members².

Finally, the history of Brazilian hemotherapy was also characterized by the demonstration of the incessant search for an organization and model characteristic of our country. Currently, blood donations are voluntary and donors go through a thorough, careful, and confidential screening process. This process has continued to increase in effectiveness and safety, in addition to reducing the existing prejudicial barriers in recent years, see bill 3598/20, which prohibits the exclusion of donors for their sexual orientation, color, or other reasons⁴.

In Brazil, currently, the principles and guidelines of the National Policy on Blood, Components and Hemoderivatives (Federal Law No10.205/2001), regulate the capture, protection of the donor and the recipient, collection, processing, storage, distribution, and transfusion of blood and its components for the prevention and treatment of diseases. Article 64 guides professionals who perform the screening of blood donation candidates to assess situations that may pose a risk to the donor and blood products. All these steps aim to promote maximum security in the process⁵.

Clinical donor screening, as indicated, is the second step in the blood donation process, which includes the steps of registration, clinical screening, and serological screening, preceded by donor mobilization and followed by blood collection. The first concerns the completion of a donor identification form, with the objective of registering the donor at the hemotherapy unit. Clinical screening, on the other hand, consists of evaluating the clinical and epidemiological history, in addition

to the potential donor's current health status and their habits and behaviors. This step must be performed prior to every donation, in order to determine if the donor is in a condition to donate blood, without harm or risk to his or her health and that of the recipient, regardless of whether the individual has already made previous donations^{5,6}.

All donated blood undergoes a testing process, which includes blood group data and the performance of serology, which makes up the serological screening. However, in order to prevent the donor from donating during the 'immunological window' for some diseases, the interview becomes a fundamental tool to prevent risks of contamination to the recipient, with the donor being classified as clinically unfit for donation. An estimate for the percentage of clinical unfitness corresponds to subtracting the number of blood collections from the number of clinical screening procedures, divided by the number of clinical screening procedures, times 100 ($\frac{\text{no. of collections} - \text{no. of screening procedures}}{\text{no. of screening procedures}} \times 100$)^{5,6}

no. of screening procedures

Candidates who do not meet the pre-established requirements for blood donation or who have a condition that makes it impossible to donate may be considered permanently or temporarily unfit. Being permanently unfit is related to the permanent impossibility of donating blood, for example, chronic kidney disease. On the other hand, temporary unfitness is related to transitory conditions, such as vaccination or recent surgery, in which, after a period of time or after reversal of the situation, the candidate becomes fit to donate again⁷.

Campaigns that encourage voluntary blood donation aim to maintain the regularity of blood stocks in hemotherapy services. Knowing and monitoring the profile of the donor in Brazil is essential to obtain important information for the targeting of blood donation campaigns, for the safety of the hemotherapy process, and for the consequent success of the entire execution⁶.

In this context, Brazilian voluntary donors represent 1.6% of the population, which fits the parameters prescribed by the WHO of 1% to 3% of the country's population as candidates for donation so that the country is considered to have a good supply of blood and hemocomponents for use by hospitals⁷.

Donor screening is the second stage of the blood donation process, preceded by donor mobilization and followed by blood collection. Questions about the possible causes of the exclusion of donors, in each of the sexes, motivated the development of this work, which compared the causes of unfitness to donate blood among men and women from hemocenters in the years 2017 to 2020.

METHODS

The article is an observational and retrospective study, with a quantitative and qualitative approach. The information was extracted from the database of an institution that promotes the collection, processing, distribution, and transfusion of blood and hemoderivatives, aiming to resolve their lack in public and philanthropic hospitals. It currently has 11 collection points, being responsible for managing 54 transfusion agencies under direct administration, supplying approximately 21,500 hemocomponents/month to around 100 client hospitals and collecting around 13,500 blood bags monthly, fulfilling the initial proposal assumed since its foundation: to contribute to the resolution of issues related to the lack of blood in the state of São Paulo.

The information accessed by our research team presented data from the pre-donation interview and did not contain any type of candidate identification. In this way, the work did not need to be submitted to the Research Ethics Committee,

since it did not directly involve candidates for blood donation. In addition, all information was kept anonymous and all the standards defined by Resolution 510/16 of the National Health Council - Ministry of Health were respected.

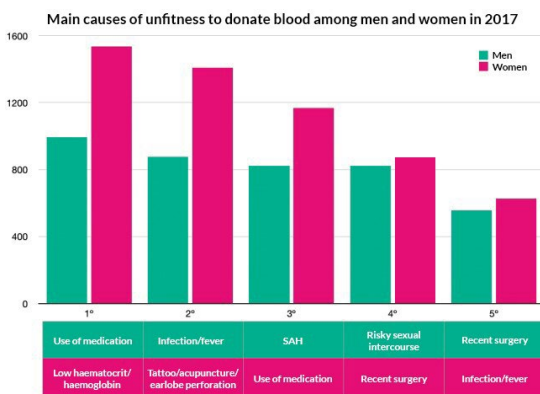
Data on the total number of candidates for blood donation, the number of suitable candidates, the number of unfit candidates, and the reason for the unfitness were accessed and tabulated, in addition to the division of all data between the sexes, male and female. The study included all this information collected from January 2016 to December 2020 in the 11 units. Special focus was given to the main causes of unfitness in each year and in the total period analyzed according to sex. Data were analyzed and processed using the Microsoft Excel program.

RESULTS AND DISCUSSION

For the analysis, the five most recurrent causes of unfitness were considered, focusing on the first three, in each year studied, and for both sexes.

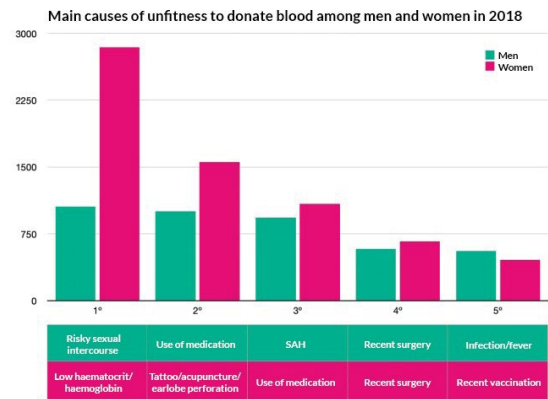
In 2017, the three most common causes among men accounted for 29% of the unfit individuals. Among women, they accounted for 28% of the unfit individuals. The other causes, highlighted among the five most common in both sexes, indicated a representativeness of less than 10% each (Figure 1). It is also important to point out that the absolute numbers of unfit males and females were close, with 10,686 women and 9,176 men.

Figure 1. Main causes of unfitness to donate blood among men and women in 2017.



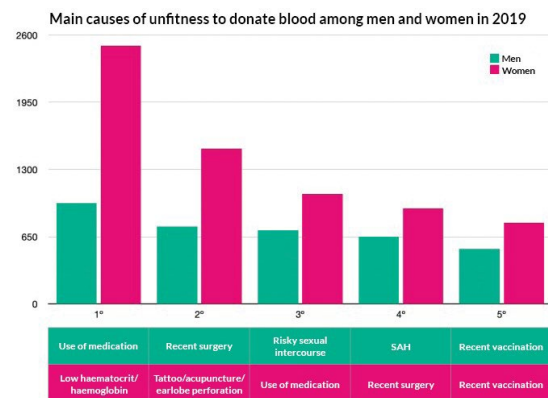
In 2018, among men, the three most common causes corresponded to approximately 31% of the unfit individuals. The three most recurrent causes among women were the same and maintained the order of occurrence compared to the previous year, but with a representation of 46% of the unfit individuals. Low hematocrit/hemoglobin stands out, which in 2018 and 2019 reached approximately 1/4 of the total number of unfit individuals among women (Figures 2 and 3). The other causes, highlighted among the five most common in both sexes, indicate a representativeness of less than 10% each (Figure 2). It is also noteworthy that the absolute numbers of unfit males and females were relatively close, with 11,895 women and 9,505 men.

Figure 2. Main causes of unfitness to donate blood among men and women in 2018.



In addition, in 2019, unlike the other years analyzed, recent vaccination appears among the 5 most frequent causes of unfitness for men, representing 6% of the total. In 2019, the three most frequent causes in men accounted for 28% of the total, while among women they accounted for 44% (Figure 3). In addition, there was a considerable gap between the absolute numbers of male (8,623) and female (11,408) unfit individuals.

Figure 3. Main causes of unfitness to donate blood among men and women in 2019.

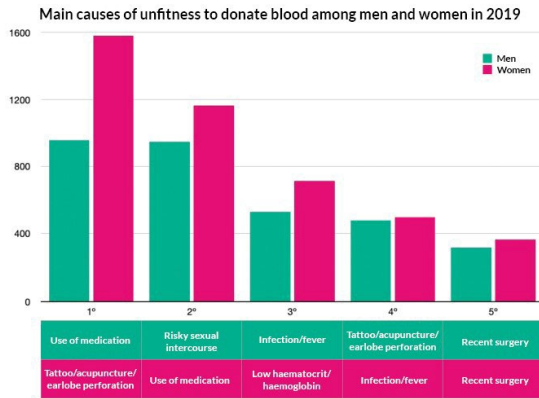


In 2020, the sum of the three most common causes, corresponded to approximately 28% of unfit men, while the three most common causes among women added up to approximately 53%. Among women, the most frequent cause - tattoo/acupuncture and ear lobe perforation - corresponded to almost 1/4 of the total. Here, it is also worth noting that the use of medication, for women, occupied the 3rd position for 3 years and in 2020 it occupied the second position among the causes, even ahead of low hematocrit/hemoglobin. In 2020, the absolute numbers of male and female unfit individuals were close.

In that year, the 2 most frequent causes among men have a considerably higher occurrence when compared to the 3 subsequent causes: use of drugs and risky sexual intercourse with 11% each, and infection and fever, high blood pressure, and recent surgery with approximately 5% each (Figure 4).

Among women, the most frequent cause - tattoo/acupuncture and ear lobe perforation, corresponded to almost 1/4 of the total, followed by medication use (18%) and low hematocrit/hemoglobin (11%) (Figure 4).

Figure 4. Main causes of unfitness to donate blood among men and women in 2020.



In the period between 2017 and 2020, the most frequent causes of unfitness for women were: low hematocrit/hemoglobin, medication use, tattoo/acupuncture/ear lobe piercing, recent surgery, recent vaccination, and infection/fever. The cause entitled recent surgery occurred constant in the 4 years evaluated, although it occupied different positions in the ranking.

For men, in the same period, the most frequent causes were: use of medication, risky sexual intercourse, systemic arterial hypertension (SAH), recent surgery, infection/fever, and recent vaccination, while the cause of unfitness entitled “use of medication” occupied one of the first three positions in all the years analyzed, corresponding to 11%.

Another data point obtained from the analysis is that for a relevant portion of those unfit to donate, the situation is temporary, that is, these individuals can donate blood and hemocomponents after the period indicated by the blood center (Chart 1), but the reality indicates a significant decrease in these donors after the event. This shows the importance and need for the development of campaigns to encourage the return of candidates to donation, contributing to the maintenance of blood bank stocks.

Table 1. Time of unfitness to donate blood among the most common causes in women and men in the period from 2017 to 2020.

Male and female sexes	
Reason for unfitness	Time of inability
Low haematocrit/hemoglobin	Temporary
Tattoo/acupuncture/earlobe perforation	Temporary
Use of medication	Temporary
Recent surgery	Temporary
Recent vaccination	Temporary
Infection/fever	Temporary
Risky sexual intercourse	Temporary
SAH	Definitive

Knowing the reasons for unfitness is extremely important, as there is a lack of donors, linked to the difficulty of obtaining suitable donors that guarantee regular stocks. This fact correlates the current fitness criteria requirements and the reduction in the number of donors.

It is also worth mentioning that after the first temporary unfitness, the donation candidate may not return to the blood center, which indicates the need to develop mechanisms that encourage donors to return. In this context, knowing the reasons for unfitness is essential not only for the development of strategies, but also to analyze the numbers of temporarily unfit individuals that can be converted into fit donors in the future.

It is important to mention that annual donations amount to 162,000 blood bags, while the unfit individuals, in the analyzed period, represented approximately 10% of this value

CONCLUSION

It is notable that the three most common causes of disability among men were: medication use, risky sexual intercourse, and systemic arterial hypertension (SAH). Among women, low hematocrit/hemoglobin, tattoo/acupuncture/ear lobe perforation, and medication use prevailed.

It became clear during the analyses carried out, that the three most common causes of disability among men and women remained practically constant in the years analyzed (2017 to 2020).

Another fact seen as essential for the creation of strategies to attract donors is the identification of candidates with temporary unfitness, as this public tends not to return to the blood center after the period of unfitness, which directly impacts the blood bank stock levels.

Studies like this one, which investigate the reasons for unfitness to donate, corroborate the need to develop fundraising actions and campaigns to increase the number of donors and reduce missed donation of blood bags. In addition, it can be observed that part of the unfitness to donate is temporary, which shows the importance and need to develop campaigns that encourage the return of candidates to donation. This measure contributes to the maintenance of blood stocks.

Finally, it is worth mentioning that the finding of reasons for exclusion due to permanent unfitness reinforces the importance and relevance of the screening process as well as the safety of transfusion procedures.

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