







# Blood donation during the Covid-19 pandemic: knowledge, practices and attitudes of medical students

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## ABSTRACT

Voluntary blood donation is a challenging act, especially during a health crisis. The purpose of this cross-sectional study was to analyze the knowledge, practices, and attitudes of medical students, from the basic cycle to the internship, regarding blood donation during the Covid-19 pandemic. The work was carried out between May and December 2021 via Google Forms. For comparison, the sample (n=327) was divided into blood donors (n=183) and non-donors (n=144). The chi-square and Fisher's exact tests were used, considering statistically significant questions with  $p < 0.05$  p-value. The results indicate that, even though they are a minority of both groups, there is still a significant number of medical students who do not know much about the blood donation process and are permeated by fear and misinformation about blood collection safety. These facts were even more noticeable during the pandemic, in which the percentage of donors was 30.6%. In this way, the need for creative and contextualized educational strategies is highlighted to clarify and better sensitize young people to this act of solidarity.

**Keywords:** Blood donors, COVID-19, Pandemics, Medical education.

## INTRODUCTION

In recent decades, the demand for blood has increased due to the aging of the population and the complexity of medicine<sup>1-5</sup>. In Brazil, blood donation is voluntary, anonymous, and unpaid<sup>1</sup>. About 1.4% of Brazilians are regular donors<sup>5</sup>, with a 3 to 5% rate recommended by the World Health Organization<sup>3-5</sup>.

Blood, its components, and derivatives are used daily in urgencies/emergencies, surgeries, transplants, chemotherapies, hemato-oncological diseases, and indications that meet current ethical standards and sanitary techniques<sup>1,4</sup>. As there are no substitutes for therapeutic purposes<sup>1</sup>, public policies and campaigns aim to clarify, attract, and retain donors and minimize obstacles to donation to increase the volume and efficiency of blood products<sup>1,6</sup>.

Recently, the Covid-19 pandemic has impacted blood stocks and donations<sup>2,5,7,8</sup>. New safety criteria were established by the Ministry of Health in the country, including avoiding crowds

with appointments previous scheduled; adjusting the gap to carry out the action; for positive diagnosis or asymptomatic patients positive for Covid-19, for ten days after complete recovery; contact with positive cases must wait seven days; change about the period to donate after application of immunizers. For Coronavac, it was established to wait up to 48 hours, whereas for AstraZeneca, Pfizer, and Janssen, seven days after application to donate<sup>9</sup>.

Understanding the motivations that guide different groups<sup>10-14</sup> to become donors or not can be a valuable tool for establishing blood donation campaigns. Based on this, and the Covid-19 pandemic<sup>9,15</sup>, which may even be repeated in other similar scenarios in the future, our work aimed to identify knowledge, attitudes, and practices (KAP) of blood donation by medical students during the pandemic. The group of medical students becomes relevant insofar as they will be the future professionals at the forefront of health care, having a dual role as opinion makers on blood donation topics and constituting a group of important potential donors.

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## METHODS

A cross-sectional study was conducted online, between May 1 and December 1, 2021, through the social networks of medical students. The project was approved by the Institutional Ethics Committee (CAAE 45120521.7.0000.0093).

Medical students were included in the study, from the basic cycle to the internship, over 18 years old, blood donors and non-donors, who agreed to participate through informed consent and completion of the questionnaire, which was made available by the authors in the social network groups and requested disclosure to other colleagues in the course. The seven academics who participated in the previous pilot project and the incomplete questionnaires were excluded.

Data was collected using Google Forms with a structured questionnaire containing closed questions about socio-demographic and academic variables, KAPs on blood donation, perception of incentives, and difficulties for this health practice.

Statistical analyses were conducted using the SPSS 17.0 program, using the chi-square and Fisher's exact tests, with  $p < 0.05$ .

## RESULTS

A total of 338 questionnaires were obtained and answered by medical students via Google Forms during the research period. Eleven questionnaires were incomplete and were excluded.

The sample was composed of 327 academics, predominantly female (75.8%), attending the basic cycle (40.4%) or clinical cycle (44%), aged between 18-25 (89.3%), and blood donors (56%) (Table 1).

Basic knowledge about blood donation differed between donors and non-donors. Regarding questions about donation frequency ( $p < 0.0001$ ), amount of blood donated ( $p < 0.0001$ ), and age limit for donation ( $p = 0.044$ ), donors had a higher assertiveness rate. Regarding the time interval for donation after tattooing and/or piercing ( $p = 0.005$ ), the non-donor group showed better results (Table 2).

Regarding the results on potential barriers that prevent greater adherence to blood donation, there was a divergence between donors and non-donors.

**Table 1**

General characteristics of medical students (N= 327).

| General characteristics of medical students                                   | N   | %      |
|---|-----|--------|
| Age   |     |        |
| 18 - 21 years   | 150 | (45.9) |
| 22 - 25 years   | 142 | (43.4) |
| Over 25   | 35  | (10.7) |
| Sex   |     |        |
| Female  | 248 | (75.8) |
| Male  | 79  | (24.2) |
| Term  |     |        |
| Basic Cycle   | 132 | (40.4) |
| Clinical Cycle  | 144 | (44.0) |
| Internship  | 51  | (15.6) |
| Have you ever donated blood?  |     |        |
| Yes   | 183 | (56.0) |
| No  | 144 | (44.0) |
| When was the last time you donated blood?                                     |     |        |
| I have never donated  | 144 | (44.0) |
| More than one year  | 83  | (25.4) |
| This year   | 100 | (30.6) |
| If you are a blood donor, where did you last donate?                          |     |        |
| Private hospitals or blood banks  | 70  | (21.4) |
| I have not donated  | 144 | (44.0) |
| Military hospitals or blood banks   | 1   | (0.3)  |
| At hospitals or blood banks of the Ministry of Health                         | 112 | (34.3) |
| If you have donated, will your last experience motivate you to donate again?  |     |        |
| No  | 4   | (1.2)  |
| I have not donated  | 144 | (44.0) |
| Yes   | 179 | (54.7) |
| Have you donated blood because someone asked for it on social media websites? |     |        |
| No  | 148 | (45.3) |
| I have not donated  | 143 | (43.7) |
| Yes   | 36  | (11.0) |
| Did you feel any side effects after donating blood?                           |     |        |
| No  | 140 | (42.8) |
| I have not donated  | 144 | (44.0) |
| Yes   | 43  | (13.1) |
| Have you ever seen any public media inviting people to donate blood?          |     |        |
| No  | 35  | (10.7) |
| Yes   | 292 | (89.3) |
| Do you encourage relatives/friends to voluntarily donate blood?               |     |        |
| No  | 29  | (8.9)  |
| Yes   | 298 | (91.1) |
| Have you received blood?  |     |        |
| No  | 326 | (99.7) |
| Yes   | 1   | (0.3)  |

Source: Research data

Risky sexual practices ( $p = 0.006$ ) and tattoo or piercing ( $p = 0.014$ ) were the most significant impediments for the sample of donors, respectively, 57.9% ( $n=106$ ) and 62.3% ( $n =106$ ). On the other hand, in the group of non-donors, 56.9% ( $n=82$ ), the barrier of having some physical or medical condition that prevents donating prevailed; however, these data were not significant for the research. Concerning nobody asking to donate ( $p = 0.009$ ) and the belief that blood is commercialized ( $p = 0.017$ ), both groups consider that such reasons do not impede a more significant number of donors, 97.3% ( $n=178$ ) and 90.3% ( $n=130$ ) for the first barrier; 97.8% ( $n=179$ ) and 91.7% ( $n=132$ ) for the second one. This fact was repeated when asked about fear of pain ( $p<0.0001$ ) and fear of the procedure itself

( $p = 0.010$ ), in which 92.9% ( $n=170$ ) of donors and 78.9% ( $n=113$ ) of non-donors agreed; 84.2% ( $n=154$ ) and 72.2% ( $n=104$ ), respectively.

Finally, receiving test results during the donation process ( $p = 0.017$ ) was perceived by most non-donors, 59.7% ( $n=86$ ), as a potential factor to encourage donation. Regarding the group of donors, no significant incentive stands out in relation to non-donors.

## DISCUSSION

Young people are the target audience for blood donation due to their propensity to be healthy, dynamic, and with many years of life to come<sup>10,11</sup>.

**Table 2**

Knowledge of medical students about blood donation (N=327).

| Knowledge of medical students about blood donation                               | Donor |        | Non-Donor |        | p-value* |
|--|-------|--------|-----------|--------|----------|
|  | N     | %      | N         | %      |          |
| According to the Ministry of Health, how often can a healthy man donate blood?   |       |        |           |        |          |
| Correct  | 147   | (80.3) | 65        | (45.1) | <0.0001  |
| Miss   | 36    | (19.7) | 79        | (54.9) |          |
| How many ml of blood are collected in each donation?                             |       |        |           |        |          |
| Correct  | 168   | (91.8) | 106       | (73.6) | <0.0001  |
| Miss   | 15    | (8.2)  | 38        | (26.4) |          |
| How long does the donation process take?   |       |        |           |        |          |
| Correct  | 84    | (45.9) | 70        | (48.6) | 0.626    |
| Miss   | 99    | (54.1) | 74        | (51.4) |          |
| Is there an age limit for donating blood?  |       |        |           |        |          |
| Correct  | 130   | (71.0) | 87        | (60.4) | 0.044    |
| Miss   | 53    | (29.0) | 57        | (39.6) |          |
| What is the minimum body weight to donate blood?                                 |       |        |           |        |          |
| Correct  | 168   | (91.8) | 131       | (91.0) | 0.790    |
| Miss   | 15    | (8.2)  | 13        | (9.0)  |          |
| Can pregnant women donate blood?   |       |        |           |        |          |
| Correct  | 90    | (49.2) | 61        | (42.4) | 0.219    |
| Miss   | 93    | (50.8) | 83        | (57.6) |          |
| How many people can one donation help?   |       |        |           |        |          |
| Correct  | 99    | (54.1) | 75        | (52.1) | 0.717    |
| Miss   | 84    | (45.9) | 69        | (47.9) |          |
| How long do you have to wait to donate blood after getting a tattoo or piercing? |       |        |           |        |          |
| Correct  | 6     | (3.3)  | 16        | (11.1) | 0.005    |
| Miss   | 177   | (96.7) | 128       | (88.9) |          |
| How long do I have to wait to drink alcohol after donating blood?                |       |        |           |        |          |
| Correct  | 24    | (13.1) | 29        | (20.1) | 0.087    |
| Miss   | 159   | (86.9) | 115       | (79.9) |          |

\* Fisher's exact test

Source: Research data

However, attracting and retaining donors is a significant challenge for hemotherapy services<sup>4,16-26</sup>. This study analyzed KAPs of medical students regarding blood shortages, which began in March 2020 and continued from April of the same year, due to the pandemic scenario of COVID-19<sup>27-32</sup>, revealing the main points to be worked on and disseminated to help in the development of the subsequent blood donation campaigns and understand the main barriers and incentives, in order to recruit a more significant number of donors.

Although young people are surrounded by quick and easily accessible information disseminated in public media, social networks, and higher education during undergraduate courses, it was found in the present sample inadequate knowledge<sup>16,21,25</sup> in the significant questions to the study.

As for the frequency at which blood can be donated, 54.9% of non-donors and about 20% of donors answered incorrectly. In the same way as in a study that included Albanian, Saudi and Turkish citizens<sup>23</sup>. Regarding the amount of blood donated in each collection, 26.4% of non-donors and a small portion of 8.2% of donors answered incorrectly. Regarding the age limit, approximately 40% of the sample of non-donors and 29% of donors were unable to answer correctly. As for the interval for donation after insertion of body adornments such as piercings and/or tattoos, almost 90% of non-donors and 96.7% of the donor sample did not obtain the desired knowledge. This result drew attention due to the numerical expressiveness of both groups.

Concerning the data obtained on knowledge, since the donor group is in assiduous contact with the blood donation process, researchers expected a higher assertiveness rate than non-donors<sup>10,19,23,33</sup> however, it is evident that there is still a significant lack of information<sup>16,25</sup> and a need for work and dissemination of information<sup>16,22,25</sup> about the process. These educational attitudes must go beyond individual expectations, requiring a greater collective nature to be efficient, which is the most relevant point of action aimed at the public of students in the health areas, since if the student receives information about the donation process during undergraduate. More important than becoming a donor, they can disseminate this knowledge to future patients, the health team,

and on the social scale<sup>33</sup>, thus evidencing the paramount importance of these educational actions for these future professionals to improve their KAPs concerning blood donations, as noted in the national<sup>12</sup> and international literature<sup>11,13,16,21,22,25</sup>.

Changing the focus on the level of knowledge of medical students and analyzing the barriers to blood donation, factors such as popular beliefs, misconceptions about donor safety<sup>25</sup> (21%), and the use of blood (5%) can generate fear of donation (13%)<sup>3,16,19</sup> and inhibit new donors<sup>8</sup>. Despite the low impact of these barriers among the majority of medical students, we hope that these issues tend to be insignificant in future research due to greater access to information<sup>34-36</sup> about the safety of the procedure, all the management of donated blood between blood banks and hospitals and the dissemination of the benefits of donation for those who need a transfusion, with one blood bag being able to save about four lives<sup>37</sup>.

The fear linked to the procedure can be related to the phobia of the needle<sup>20,24</sup>, possible side effects, light after donation, and the pain that the perforation causes<sup>16,36</sup>. In a study in Albania, fear of developing anemia, fear of seeing blood, and injection<sup>23</sup> were scored. Similar results were obtained in a study with nursing students from Spain and Portugal<sup>16</sup>.

Further research is necessary to specifically demystify the causes of these fears and analyze the possible impact on a future donation.

Despite this, it is worth noting that one of the major contributors to fear, during the study period, was the uncertainty triggered by SARS CoV-2<sup>2,5,7,8,21</sup>, mainly the fear of contracting the disease when visiting environments with a high risk of contamination - hospitals and blood banks - and the difficulty of commuting to these collection sites<sup>20,21</sup> due to government restrictions, lockdown, and flow control in hospitals. These two factors inhibited blood donation in 18% of participants in an Indian study<sup>31</sup>, 81% in a Chinese study<sup>35</sup>, and 87.5% in a Hong Kong study<sup>29</sup>. Such fears, difficulties, and uncertainties considerably affected donation rates and reduced blood bank stocks<sup>26-28</sup>.

Notes were published by the Ministry of Health<sup>9</sup> and Ordinances by the Official Gazette<sup>1</sup> during the pandemic to make the blood donation process as safe as possible. Just like in the

US, new policies to adapt to a decrease in blood supply and protect donors from COVID-19 were needed<sup>26</sup>. In addition to these obstacles obtained in this study, clinical disability is frequently described in the literature<sup>12,18,20-24</sup>.

Although, in this present study, greater significance was observed between the barriers to donation, in previous studies, in approaching possible incentives for the act of solidarity, receiving test results during the donation process ( $p = 0.017$ ), denoted as a conceivable pillar of donor loyalty. This fact was repeated in a study with donors in Malaysia, in which 39.3% of the sample agreed they could donate blood to check serology for HIV<sup>25</sup>. General satisfaction with a previous donation experience was also a significant predictor of new donations<sup>30,33,35</sup>.

Blood donors tend to have high social and collective awareness levels, but the donation frequency may be influenced by convenience and personal<sup>12,14</sup> and sociocultural benefit<sup>11,13</sup>. Ideas of donating as an act of altruism<sup>17,19,20,23,24</sup> or due to the perception of civic responsibility were the most common motivating factors, even during a pandemic in developed countries such as Hong Kong<sup>29</sup> and Germany<sup>30</sup>; on the other hand, in underdeveloped countries, the greatest incentive for donation is the act of donating to family members<sup>32</sup>. However, mass media campaigns can raise awareness and positively change this behavioral context<sup>20,34</sup>.

As blood and its components are critical in surgeries and procedures to preserve life, valuing the donation experience and building value associated with the donor can mobilize and retain donors<sup>3,8</sup>. In the present sample, the overall donation experience was satisfactory (54.7%) and encouraging to motivate other people (91.1%), revealing favorable attitudes towards a new donation (54%). Adherence and frequency in blood donation are affected by several elements, such as reduced circulation and interruption of activities, which were not considered in this investigation. Thus, the limitations of this work need to be considered. The questionnaire was sent over the internet and self-completed, being subject to memory bias and deviation between the answer and the respondent's actual values. On the other hand, the pandemic has impacted and scared the

world, with unprecedented repercussions and lessons learned in all health and dimensions of life.

In short, these students will be physicians who will need to make quick, assertive, and ethical decisions regarding the rational and conscious use of blood products and their possible alternatives (oral or parenteral iron, erythropoiesis-stimulating agents) during health crises and in their professional routine<sup>1</sup>. Thus, this study provokes reflections on the need to discuss better and disseminate the various possibilities of donation among young people. Blood and blood products are fundamental in medical care, saving and improving lives.

## CONCLUSION

The students showed good potential for collaborating with blood demands during the health crisis, but there was fear, insecurity, and misinformation. Performing laboratory tests during the process was perceived as an incentive to donate, while risky sexual practices, tattooing or piercing, the belief that blood is commercialized, fear of pain, and the procedure were obstacles. Continued actions more focused on contextual and relevant factors for young people can encourage adherence and loyalty to blood donation.

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