

Blood donation during the coronavirus pandemic

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Abstract

Introduction: Despite years of research and scientific work, it has not yet been possible to produce such a valuable medication as blood. The pandemic does not reduce the need for blood, quite the opposite. However, due to the pandemic, the number of blood donors has dropped dramatically across the country. The aim of the study was to find out the opinions and attitudes of the respondents towards blood donation during the pandemic period and to assess their knowledge of the principles related to safe blood donation during this period.

Material and methods: The study was conducted using a diagnostic survey method and the tool was our own research questionnaire. The study was conducted in February 2021, using Google Forms platform. In total, data were collected from 150 individuals (females: 60.6%, males 39.4%) aged between 16 and 73 years (mean 31.4 ± 12.4 years). Statistical analyses used a significance level of $p = 0.05$.

Results: Nearly 39.7% of the respondents were regular blood donors, 12% of the respondents donated blood several times (12.3%). Blood was donated more often by men, people aged over 30 years, urban residents, and people with higher education ($p < 0.001$). Most people continued to donate blood despite the COVID-19 pandemic (49.7%). Respondents who have donated blood so far still mostly want to donate blood after the pandemic (90%), among those who have not done so 38% want to do so after the pandemic ($p < 0.001$). The vast majority of respondents believed it was safe to donate blood during the pandemic (93%), and most were aware that symptoms of infection disqualify a blood donor (83.2%). Only 43.2% knew that "Convalescents who donate plasma are entitled to a blood donation deduction".

Conclusions: The current pandemic situation is not an obstacle to donating blood. Blood donations should not be withheld unless there are health contraindications. Due to additional procedures, it is still safe to donate blood. Efforts to promote blood donation during the COVID-19 pandemic should be continued.

Keywords: blood donation, safety, COVID-19

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Introduction

Recently, due to the coronavirus pandemic, most scheduled surgeries have been canceled, but many patients after accidents, transplants, and during cancer treatment need blood. Planned surgeries are now gradually being restored and there is an increasing demand from hospitals for blood and its components.

Blood donation during a pandemic

The temperature should be measured before leaving home. Those with a temperature above 37.3°C will not be allowed to donate blood and should also consult their family doctor. All blood collection sites have a pre-qualification station where the donor fills out a pre-qualification questionnaire, disinfects their hands, and each donor's temperature is measured (with a non-contact thermometer). After the initial qualification, the donor is registered and subject to the second qualification. A person who, among others, has not been abroad for the last 14 days, their body temperature does not exceed 37.3°C, has no symptoms of infection, is not under quarantine, epidemiological surveillance and during the last 14 days had no contact with a person with confirmed infection with coronavirus, can donate blood. Due to the current epidemiological situation, it is recommended that donors be registered for blood donation without accompanying persons. Donors waiting to donate blood maintain the necessary distance. Each blood donor receives a mask, gloves and a disposable pen. Only disposable equipment is used to collect blood and samples for testing. Donating blood, even during a pandemic, is safe. Blood donors can go to the Regional Blood Donation and Hemotherapy Centers without worrying about their health and the health of their relatives, which is necessary to successively rebuild the Centers' stocks before the epidemic [1].

The privileges of blood donors (including convalescent plasma donors) include [2-4]:

- time off from work or school (one day) and during an epidemic or pandemic - two days (the day of donation and the following day);
- reimbursement of travel expenses to the blood donor center;
- discounts on public transport (33%) after three donations;
- tax benefits – accounting for donating blood or blood components as a donation;
- regeneration meal of 4500 kcal;
- receiving free results of laboratory tests, i.e., determination of blood type A, B, 0 and Rh (receiving a blood

type identification card after the third donation), complete blood count, markers for hepatitis B and C, AIDS and syphilis infection;

- discounts on certain medications (for Distinguished Voluntary Blood Donors);
- out-of-sequence use of health care services in the scope of inpatient health care services and specialist services in outpatient health care (Distinguished Voluntary Blood Donor).

The health benefits of blood donation include lower risk of myocardial infarction [5], better control of type 2 diabetes [6], lower blood pressure [7], lower total cholesterol, LDL cholesterol, and triglycerides [8], lower risk of cancer [9].

Due to the epidemiological situation, the new requirements for blood donations are to refrain from blood donation when there are symptoms that may indicate COVID-19 infection (fever, dry cough, runny nose, shallow breathing, shortness of breath) and to report to the blood center if similar symptoms occur up to 48 hours after donation. Additional procedures include respect of the distance and hand disinfection, mouth and nose coverings, initial temperature measurement, and completion of a questionnaire regarding travel abroad and contact with a person infected with coronavirus [1]. In addition, donors who donate blood without knowing that they are ill, and in whom, within 14 days, medical services detect COVID-19 (positive laboratory tests) are asked to report this fact to the Regional Blood Donor Center and the field branch [10].

Material and methods

The study was carried out using the diagnostic survey method, and the tool was the authors' questionnaire. The questionnaire consisted of 14 questions. The questions were related to blood donation during the pandemic. The study was conducted on February 28, 2021 through social media using Google Forms platform. The open link to the survey was placed in groups associating residents of Tarnów and the surrounding area. There were no limitations of age and gender. The total number of respondents was 156 (6 of 156 questionnaires were rejected because they were incomplete). The significance of the relationship between the two nominal variables was tested using the chi square test of independence. A significance level of $p = 0.05$ was assumed in the statistical analyses. At the beginning of the survey, participants were informed about aim of the research; at the same time respondents were anonymous. The study was conducted in compliance with ethical principles and good research practice resulting from the Declaration of Helsinki. Respondents had the option to refuse to answering the survey at any points.

The questionnaires were completed mostly by women. The mean age of the respondents was 31.4 years (± 12.4 years), the youngest respondent was 16 years old, and the oldest respondent was 73 years old. The ratio of those living in rural and urban areas was similar (51.0% vs. 49.0%). The majority of people declared secondary education (48.4%) and higher education (39.4%). The remaining persons had primary (1%), junior high (6%), and vocational (6%) education.

Results

Nearly 39.7% of the respondents were regular blood donors, 12.3% of the respondents had donated blood several times or only once (6.5%), 16.1% of the respondents had not donated blood, due to illness or other contraindications, 12.9% were afraid to donate blood, 9.7% do not want to be a donor, and 3.9% had never heard of the possibility of donating blood.

93.5% of the respondents had heard about the possibility of donating plasma, but 12.3% of the respondents had the intention to donate plasma, with 1.3% having already donated plasma. Blood was donated more often by men (68.9%) than women (50.0%; $p = 0.020$), more often by those aged over 30 years (66.7%), less often by younger respondents (50.0%; $p = 0.037$). More often blood was donated by inhabitants of cities (69.7%), less often by inhabitants of rural areas (45.6%; $p = 0.002$). People with higher education (78.7%) were most likely to donate blood, less frequently respondents with secondary education (44.0%) or lower levels of education (42.1%). These differences were statistically significant ($p < 0.001$) (Tab. 1). It is worth noting that the level of education also influenced the willingness to donate blood after the pandemic period: the willingness to donate blood was declared most frequently by respondents with higher education, followed by those with secondary education and with primary/vocational education ($p = 0.044$).

Table 1. Past blood donation ever vs. sociodemographic data

			Sex		Chi square test	
			Woman	Man		
Blood donation	Yes	number	47	42	$\chi^2 = 5.39$; $p = 0.020$	
		% of sex	50.0%	68.9%		
	No	number	47	19		
		% of sex	50.0%	31.1%		
			Age		Chi square test	
			≤ 30 years	> 30 years		
Blood donation	Yes	number	41	48	$\chi^2 = 4.37$; $p = 0.037$	
		% of age	50.0%	66.7%		
	No	number	41	24		
		% of age	50.0%	33.3%		
			Place of residence		Chi square test	
			Rural	Urban		
Blood donation	Yes	number	36	53	$\chi^2 = 9.25$; $p = 0.002$	
		% of place	45.6%	69.7%		
	No	number	43	23		
		% of place	54.4%	30.3%		
			Education			Chi square test
			Primary/ vocational	Secondary	Higher	
Blood donation	Yes	number	8	33	48	$\chi^2 = 18.63$; $p < 0.001$
		% of education	42.1%	44.0%	78.7%	
	No	number	11	42	13	
		% of education	57.9%	56.0%	21.3%	

The majority of people continued to donate blood despite the COVID-19 pandemic (49.7%), 39% of respondents had not donated blood before and have no intention to do so during the pandemic (38.9%), 7.7% wanted to donate blood although they had not done so before, and 3.9% did not donate blood because they were afraid of the threat of COVID-19 infection. 67.7% of respondents had the intention to donate blood after the end of the pandemic. Respondents who donated blood before still mostly want to donate blood after the pandemic (90%), among those who did not donate blood before, 38% want to do so after the pandemic ($p < 0.001$).

There were no statistically significant differences between the groups based on sex, age, place of residence and blood donation during the pandemic ($p > 0.05$). However, donating blood during pandemic was related to education ($p = 0.015$): during pandemic, respondents with higher education were most likely to donate blood (70.5%), respondents with secondary education were less likely to donate blood (52.0%), and respondents with lower education level were least likely to donate blood (36.8%).

The vast majority of respondents believed that it was safe to donate blood during a pandemic (93%). Knowledge of the rules of blood donation during the pandemic was verified. The majority of respondents believed that symptoms of infection disqualify a blood donor (83.2%) and that a person who has not been in contact with a person infected with coronavirus in the last 14 days may donate blood (71.6%) (Fig. 1).

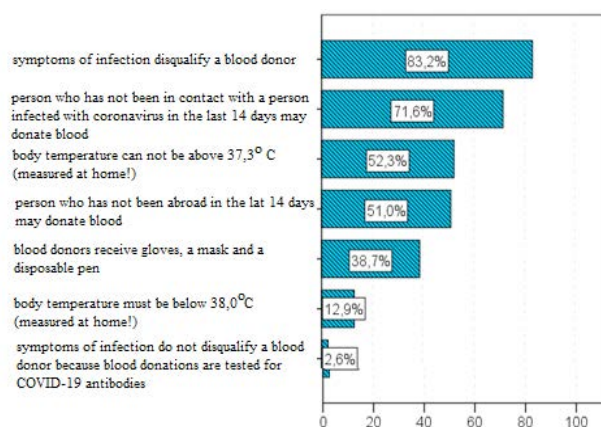


Figure 1. Rules related to blood donation during the pandemic. (Multiple responses possible.)

It was further examined whether the respondents were aware of the privileges of blood donation. Respondents most often considered “A voluntary blood donor who donates blood or its components, including plasma after COVID-19 disease, is entitled to exemption from official duties on the day they donate

blood or its components and on the following day” as the true sentence (85,8%). Slightly less than half (49.7%) were aware that “Voluntary blood donors who have donated at least 3 donations of blood or its components, including plasma after COVID-19 disease are entitled to a 33% discount on travel on domestic public transport,” the least number of people were aware (43.2%) that “Convalescents who donate plasma are entitled to a donation deduction for blood donation purposes.”

Discussion

The influenza A virus subtype H1N1 (H1N1) pandemic had a significant impact on blood supplies due to donors’ fear of exposure to the virus at a blood center [11,12]. Similarly, the COVID-19 pandemic has already led to a significant reduction in blood supplies due to the cancellation of numerous out-of-hospital and mobile blood collection events, as well as a significant reduction in the number of donors arriving at fixed blood donation centers. For example, as a result of the current pandemic and restrictions due to social distancing, nearly 4,000 American Red Cross blood donation drives have been cancelled in the United States through April 2020 [13].

Moreover, the number of eligible donors during the pandemic inevitably decreased due to the increasing number of people infected or quarantined after an exposure to infected individuals. In addition, blood collection centers have introduced additional screening criteria, rejecting donors with travel histories due to “hot spots” of infection in the past 14 days. In the context of the pandemic, there is also increasing pressure on blood donation centers and hospital transfusion medicine services and their staff, as increasing number of workers must stay in isolation [14].

One of the major challenges ahead of us is to maintain high spirits and persistent motivation amongst the volunteer donors to keep donating blood, even during the crisis of COVID-19 pandemic. Analysis of demographic data indicates a high probability of an increased demand for blood and blood components in the future. There is a clear downward trend in the youngest group of donors (18-24), which makes us look at the future with great concern. It will become increasingly important to motivate people of all ages to donate blood and to aim for them to become regular donors, but the greatest attention should be focused on the youngest donors, as this is the group that will be able to donate blood and blood components for the longest time. Between 2005 and 2017, the total number of donors was 8,691,611, including 2,542,621 (29.3%) women and 6,148,990 (70.7%) men [15]. These results are consistent with the analysis of our study, according to which women in 31.3% have ever donated blood and its components. The authors of the analysis on

the characteristics of the demographic structure of the community of donors in the years 2005-2017 emphasize the importance of taking measures to increase the number of women coming forward to donate blood. For many years, the female population in Poland has accounted for 30-32% of the total population of donors coming to the Regional Blood Donation and Hemotherapy Centers to donate blood and its components. Although this is in line with the trend in other countries around the world, it would be advisable to analyze the factors which demotivate women to donate blood, as currently less than 10% of women in Poland are regular donors [15].

The analysis of our results demonstrated that 58.5% of the examined individuals donated blood at least once in their lifetime. According to the study of Kollataj et al. concerning voluntary blood donation among students of the Medical University of Lublin, out of 393 respondents, 33.4% donated blood at least once [16], and in the study performed by Kozłowska and Wójta-Kempa among 400 students, 35% declared that they had already donated blood [17]. The study by Markowska and Węglińska described approximately 48% of respondents who had not donated blood so far, with the main reason being health contraindications (29.9%) [18]. In our study, 16.1% of respondents indicated health contraindications.

The study conducted by Vásquez et al. on a group of 487 students and staff at Talca University in Chile indicates that those with higher education were more likely to donate blood than those with lower education. The same researchers indicate that 86% of respondents had never donated blood. In addition, Vasquez et al. also examined the predisposition to donate blood in the future. The study showed that 87.3% of the respondents were willing to donate blood in the future. Moreover, the researchers also analyzed the effect of gender of the respondents on the willingness to donate blood in the future; however, they found no statistically significant differences [19]. The analysis of our study also showed the relationship between past and present (during the pandemic) blood donations and willingness to donate blood in the future and the education of the respondents – the respondents with higher education were the most willing to declare themselves in this aspect. Respondents' sex and place of residence had no effect on their decision to donate blood.

The factor constituting the barrier to blood donation according to the study by Hupfer et al. conducted among 450 students of the DeGroote Business School of McMaster University in Canada was the fear of the blood donation process, which included the following: fear of needles, fear of seeing blood, anxiety about pain or bruising, anxiety about some mistakes made by the personnel during donation and fear of adverse side effects, i.e., weakness or fatigue, dizziness, nausea or fainting

[20]. Health considerations are also the main barrier to blood donation (37.7%) according to the results of the study carried out in Greece by the Hellenic Blood Transfusion Society on 1600 donors [21] and in the study by Orzeł-Nowak and Wcisło (35.05%), who conducted the study among 655 students of Kraków universities [22]. The fear of donating blood in our study was indicated by 12.9% of respondents.

The rules for donating blood during a pandemic are very important because Regional Blood Donation Centers should be safe for donors. The study shows that many people are not aware of the rules that apply during the pandemic, resulting in fear due to lack of information and thus lack of conviction to go to a Blood Donation Center and donate blood. Finally, it is also worth noting that many people do not know the additional privileges of being a blood donor. It is important to spread the knowledge about the privileges, as this may translate into an increased number of donors.

Conclusions

The COVID-19 pandemic is causing a shortage of blood supplies worldwide. Although there is no convincing evidence that this virus can be transmitted by transfusion, the disruption that occurs in everyday life dramatically affects the quantity of donated blood. In conclusion, COVID-19 is a pandemic crisis that needs a collaborative effort from blood donors, community, blood transfusion services, and administration. The current pandemic situation is not an obstacle to donating blood. Blood donations should not be withheld unless there are health contraindications. The pandemic is not reducing the need for blood; in fact, the number of blood donors across the country has dropped dramatically due to the pandemic. Due to additional procedures, it is still safe to donate blood. Individuals who have symptoms suggestive of COVID-19 should refrain from donating blood.

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