

MOTIVATION OF BLOOD DONORS DURING THE COVID-19 PANDEMIC IN THE REGIONAL CENTER FOR TRANSFUSION MEDICINE TETOVO WITH OTHER SERVICES GOSTIVAR, KICEVO, AND STRUGA

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Abstract

Donating blood and saving the lives at the same time of the sick or injured people who need blood the most, is a high moral, human and solidarity act as well as a general social obligation. Blood transfusion is considered an integral part of medicine that treats thousands of patients every year, making blood products' management, safety, and storage fundamental in every country's national healthcare policy [1, 2].

This act represents altruism and awareness of society to come to the aid of all patients who are being treated and operated on in public and private hospitals in Tetovo, Gostivar, Kicevo, and Struga (the western part of North Macedonia). However, not everyone can or is willing to donate; hence, constant encouragement from blood centers is, therefore, a necessary prosocial behavior so that blood can be collected from all blood types. Successfully realization of this act incorporates high motivation, raising awareness and compassion of blood donors, which is a difficult task for the institute for transfusion medicine.

The institute is fully committed by organizing different activities such are promotional activities, announcing blood donation activities within the hospital and university locations, social media (Facebook, Twitter, Instagram, LinkedIn), newspapers, posters in various formats, brochures, TV spots (20-30 seconds) and radio broadcasts (10-20 seconds) as a way of mass communication with potential blood donors. These mechanisms are crucial and impact also all staff employed in these transfusion services, for drawing a concise plan, strategy, analysis, adequate decisions, implementation of ideas, preparations for frequent audits for recruiting as many blood donors as possible to increase blood reserves and deal with various crises during emergencies (wars, earthquakes, floods, etc.).

Blood donation is based on the following 3 cardinal principles: voluntary action, it's not paid, and donor ID remains anonymous. In the segment of blood donation, there is no place for social, racial, religious, national, economical class, or political discrimination. During blood donation, we must take maximum care of the health of the blood donor on one side and on the other, the quality of blood and components of the blood recipient-patient must be provided. For the donation to be successful at the state level, the report through the Ministry of Health of the Republic of North Macedonia, the Red Cross, and the institute for transfusion medicine with relevant services.

Since December 2019, the world was plagued by a new disease that originated in Wuhan, China, and by the moment of speaking it has infected almost 500 million people around the globe, causing at least 6 million deaths across 227 countries [3].

The social and economical lockdown was implemented, and the fear of virus transmission has not only affected the public's health and a decline in the economy, but it caused a significant drop in the number of blood donations across the world including North Macedonia also. The blood donation process was negatively influenced by the COVID-19 pandemic due to a dramatic decrease in blood donors, forcing blood banks and blood donation centers to implement new policies to increase blood supply while protecting donors from COVID-19 infection [4]. The adequate and safe availability of blood to meet patient needs became a significant concern.

The ratio of blood donation significantly decreased by 40% to 67%, especially during COVID-19 worldwide [5]. Active donors failed to approach blood transfusion centers, and people are dying from other diseases and the pandemic COVID-19 due to a shortage of blood supply [6,7]. On average, more than 118.5 million blood units are collected worldwide [8].

Because of the successful action plan designed by our institute, before the Covid-19 pandemics arise, the crisis did not affect at all blood reservoirs at our institute and blood donation at all, because it increased mobilization of the population to donate blood, a process which was interrupted in a small range of period including the total lockdown from March to May 2020, when was seen a significant drop in blood donation, but was not associated with insufficient blood supply, this maybe because of the reduction of surgical procedures and traumatic accidents during this period.

Thus, considering everything said above, the aim of this paper is to:

To show the ratio between voluntary and family donations during the period Covid-19 2020-2021;

What is the percentage of voluntary donation during this period;
Comparing blood donation statistics before and after Covid-19 crisis, and how the crisis has impacted blood donation;
Presenting the structure of blood donation in the context of age, gender, ethnicity and profession.
A systematically research for studies that have been conducted in other countries and comparing statistics with our country.

Keywords: Motivation, blood donation, Covid-19 pandemic

1. Material and methods

Data from in-service and out-of-service blood donation diaries were used, including the service of transfusion medicine in Tetovo, Gostivar, Kichevo, and Struga, as well as questionnaires that provide a reliable anamnesis for the recruitment of blood donors.

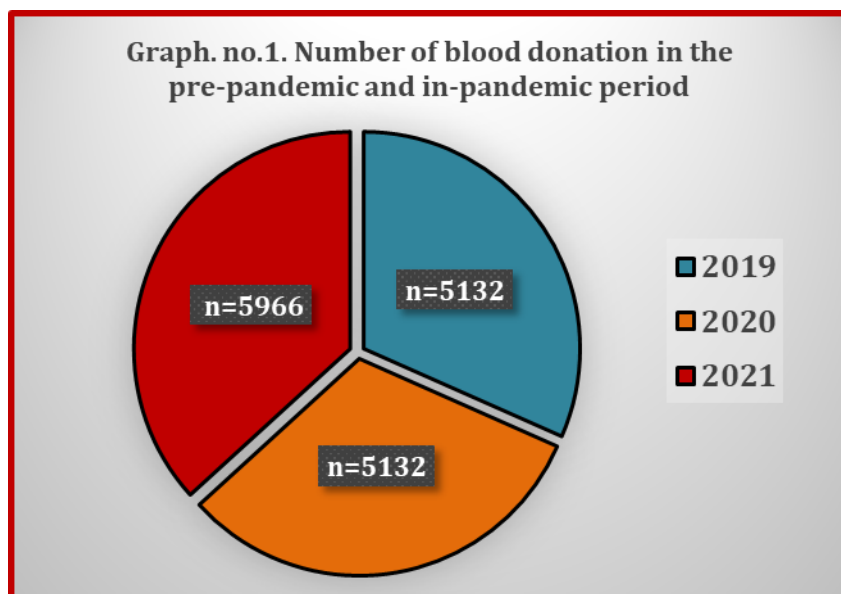
A systematic review and meta-analysis were performed to identify the articles needed to evaluate the impact of COVID-19 on blood transfusion services. Three databases were thoroughly searched: PubMed/Medline, SCOPUS, EBSCO, Google Scholar, and ResearchGate for eligible articles. Considering that this paper focused only on COVID-19, the time frame was limited to 2020-2021.

Data extracted from national diaries were calculated and analyzed with Microsoft Excel 2013. The Kolmogorov-Smirnov test was used to assess the normality of the data. Categorical variables were described by frequency and percentage. The Chi-square test was used to perform cross-tabulation for comparison between the selected groups of variables. The statistical significance limit was taken as $p < 0.05$.

2. Results

The growing trend of voluntary donors achieved through various sensibility campaigns mentioned above was expected to decrease as it happened worldwide, but the data that we will present below show that this trend has not decreased, but it has increased voluntary blood donation. In the following, we are presenting the data received from the 4 transfusion centers of the western part of Northern Macedonia, respectively from Tetovo, Gostivar, Kichevo, and Struga. All results will first be presented in a descriptive summary in table 1 and then graphically for each city the data of the period before the pandemic (2019) and in the two years after (2020, 2021) the Covid-19 pandemic will be shown. In this table are shown data of age group, gender, occupation, nationality, residency, donors by city, type of blood donors (voluntary, familiar, or paid), and rejected blood donors for any reason that contraindicated blood donation.

The graphic below it is shown the total number of blood donors in 2019 (before the pandemic Covid-19) and in the two years of the pandemic, 2020 and 2021 respectively.



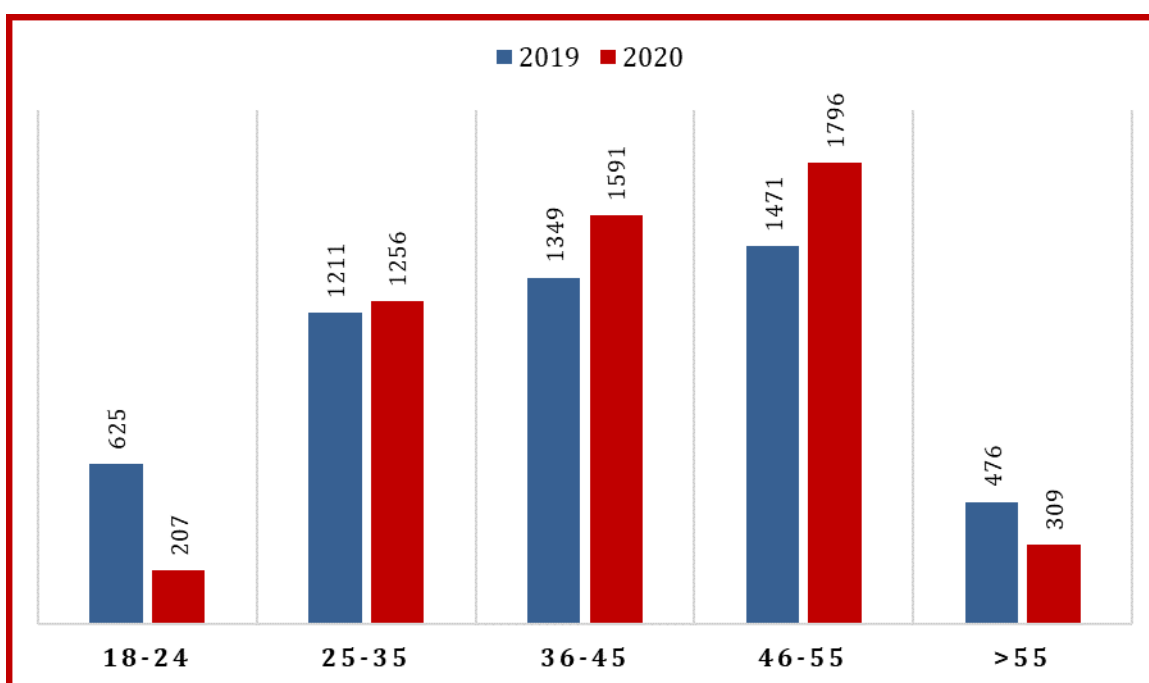
Rather a coincidence or not, the number of blood donations during 2019 and 2020 which is the first year and the most influencing blood donation worldwide, in our country surprisingly the number remains the same, while a significantly higher number of blood donations is seen after mitigation of restrictive measures ($p=0,0839$).

Table 1 General and sociodemographic data are taken from the national registry for blood donation for the western part of the Republic of North Macedonia

Sociodemographic data		Blood donation period			Total	p-value
		2019	2020	2021		
Age group	18-24	n=625	n=207	n=388	n=1220	$p=0,043^*$
	25-35	n=1211	n=1256	n=1522	n=3989	$p=0,287$
	36-45	n=1349	n=1591	n=1867	n=4807	$p=0,102$
	46-55	n=1471	n=1769	n=1873	n=5113	$p=0,083$
	>55	n=476	n=309	n=316	n=1101	$p=0,113$
		T= 5132	T=5132	T=5966	T= 16230	$p=0,0839$
Gender	Male	n=4445	n=4626	n=5284	n=14355	$p<0,05^*$
	Female	n=687	n=506	n=682	n=1875	
Occupation	Student	12,2%	4,03%	6,5%	7,57%	$p<0,05^*$
	Educational sector	27,1%	18,67%	26,3%	24,03%	$p=0,241$
	Health sector	43,2 %	53,8%	49,6%	48,87%	$p=0,092$
	Other	17,5%	23,5%	17,6%	19,53%	$p=0,429$
Nationality	Macedonian	48,55%	49,77%	46,79%	48,37%	$p=0,516$
	Albanian	40,16%	44,15%	46,19%	43,5%	$p=0,284$
	Other	11,29%	6,08%	7,02%	8,13%	$p=0,173$

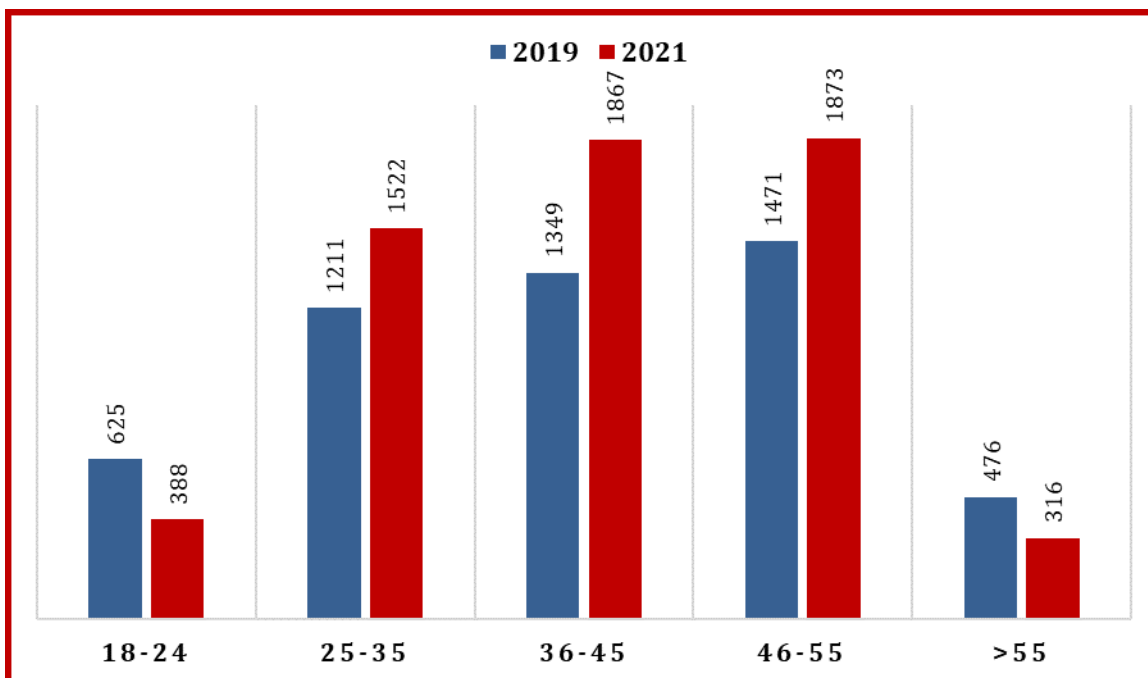
Residency	Rural	59,4%	56,8%	58,5%	58,23%	<i>p=0,672</i>
	Urban	40,6%	43,2%	41,5%	41,77%	
Number of donors by city	Tetovo	n=1819	n=2239	n=2448	n=6506	<i>p=0,078</i>
	Gostivar	n=1108	n=1007	n=1311	n=3426	<i>p=0,104</i>
	Kicevo	n=848	n=806	n=936	n=2590	<i>p=0,181</i>
	Struga	n=1357	n=1080	n=1271	n=3708	<i>p=0,068</i>
		T=5132	T=5132	T=5966	T=16230	<i>p=0,0839</i>
Type of blood donation	Voluntary	99,89%	86,96%	87,1%	91,32%	<i>p=0,072</i>
	Familiar	0,11%	13,04%	12,9%	8,68%	<i>p<0,05*</i>
	Paid	0,00%	0,00%	0,00%	0,00%	/
Rejected Blood donors		n=149	n=53	n=69	n=271	<i>p<0,05*</i>

* Statistically significant



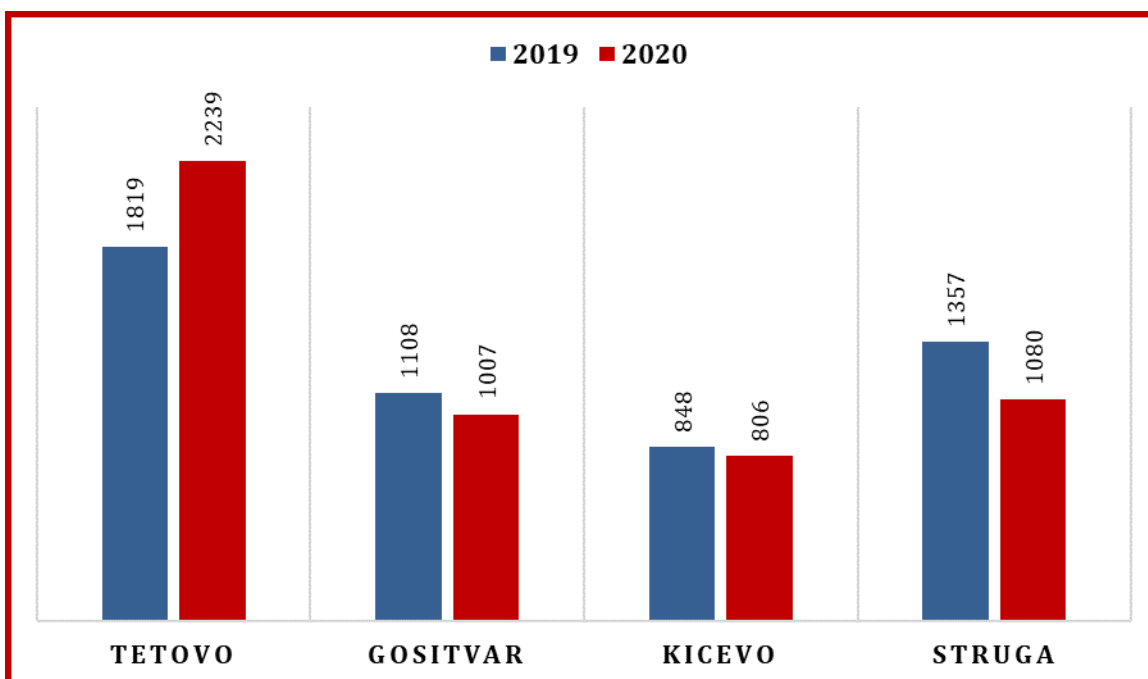
Graph 2. Number of blood donation by group age in 2019 and 2020

All age groups are included in the process of blood donation. For statistical reasons, age groups are divided into 5 groups. Our data show that during 2019 the age group from 46 to 55 years old consisted of the highest number of volunteers (31.5%).



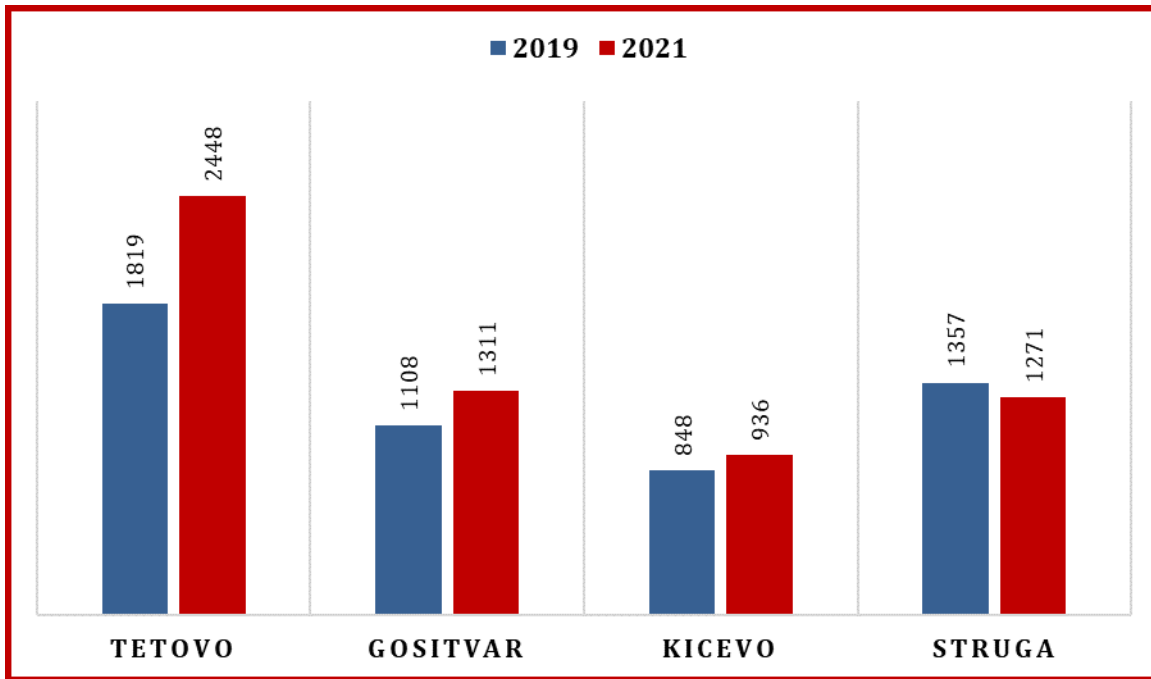
Graph 3. Number of blood donation by group age in 2019 and 2021

The lowest number consisted of donors from the age group >55 years old which consist of 6,78% of the overall number during these 3 years. There is a statistically significant drop in the percentage of blood donators in the age group 18-24 years old, from 12,1% in 2019 to 4,03% in 2020 and 6,5% in 2021 of overall blood donation. Statistics of the age groups are presented in the graph. No.2.



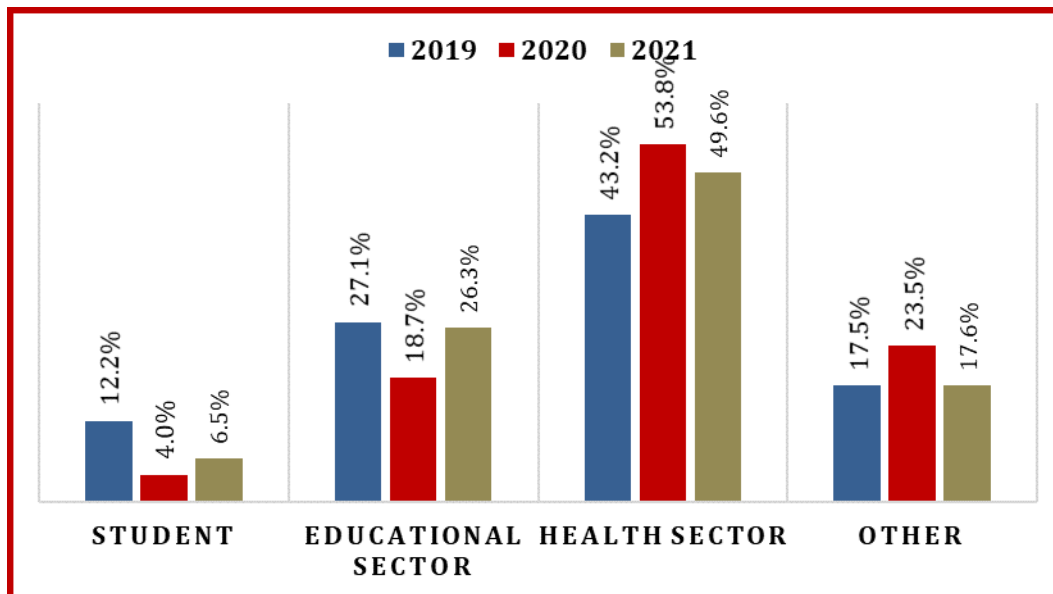
Graph 4. Number of blood donation by cities in 2019 and 2020

It is known that Tetovo is the city of two universities and the existence of the Medical Faculty at the University of Tetova, with medical students, gives another dimension to this altruistic act, also by encouraging and making aware others for the health benefits of blood donation, which is translated with a higher number of volunteers in this city. The number of blood donations by cities during 2019, 2020, and 2021 is shown in graphs 4 and 5.

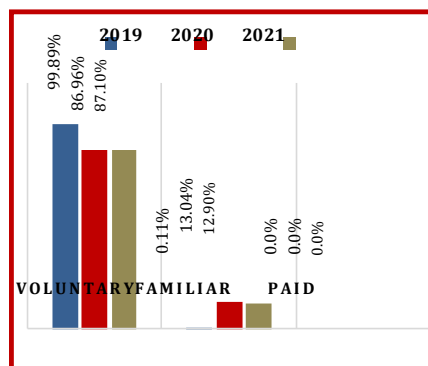
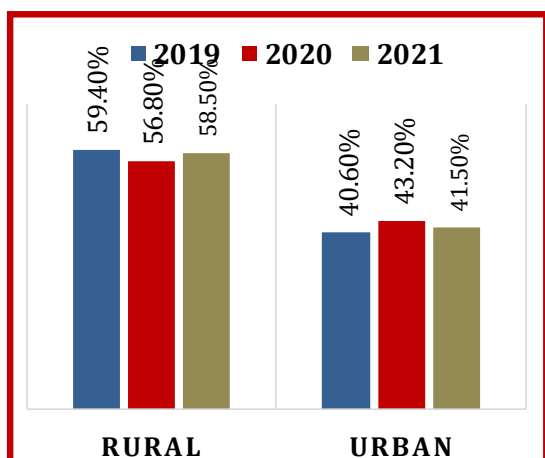
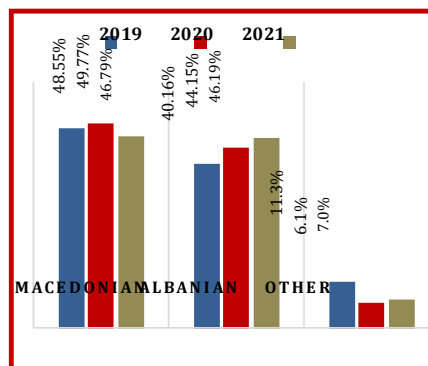
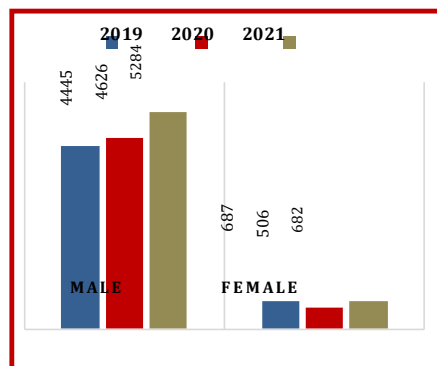


Graph 5. Number of blood donation by cities in 2019 and 2021

Another aspect of the analysis was how the occupation was impacted by the Covid-19 crisis. Data are represented graphically in graphic 6.



Graph 6. Number of blood donation by cities in 2019 and 2021



Graph 7. Summary of data considering these aspects: gender, nationality, residence and type of blood donation during 2019, 2020 and 2021

From the graph no.6 above we see that the Covid-19 crisis has affected the student group the most and mobilized the health sector by increasing their voluntary acts on blood donation because of various unpredictable situations.

There is no statistical significance difference in the aspect of nationality, gender, residency, and type of blood donation volunteers. Their data are summarized in the graph. No.7. Males seem to show more solidarity in the process of blood donation, and we still must work on this sector because of the patriarchal model of our society and to increase the percentage of blood donation in females. Both, the Macedonian and Albanian communities consist of most of the population of this region, and the percentage of donations seems to be equal, 48,37% versus 43,5% respectively. People from rural zones, always according to our data shown to have a higher percentage in participation of blood donation (58,23%) compared to urban zones (41,77%). And finally, voluntary blood donation has shown a decrease in the two years of a pandemic by almost 10% in the two years of the Covid-19 pandemic, from 99,89% in 2019 to 86,11% in 2020 and 87,1% in 2021, showing an increase of ~12% of familiar blood donating. We don't have anyone who is paid for donating blood, this concept does not exist in our country.

3. Discussion

Analysis of retrospective surveys like this one is important to understand the barriers, difficulties and motivational factors for blood donation. Blood donation is the vertebral column of blood supply globally as the blood could not be synthesized. In pandemics such as the current COVID-19 and other human emergencies, blood donation, and management of the blood supply is substantial and fraught with obstacles for the health system. With the onset of the COVID-19 pandemic, concerns grew about the availability of sufficient and safe blood to meet patient needs. But, even during the time of Covid-19 the number of voluntary blood donors has been the same during the first year of pandemic and increased within the next year (2021), which means that we have covered the requests for blood in all hospitals where the relevant services of transfusion medicine are present.

There are a lot of studies which have observed a reduction in the frequency of blood donating volunteers worldwide to 67% [7], which is explained by lockdown and fear of coronavirus infection, despite that the SARS-CoV-2 transmission by blood has not documented [9,10]. In a systematic review made by Chiem C et al. it has shown in a table a summary of 6 studies from 38 blood centers, all showing a significant decrease in blood donation [11]. Data summarized in table 2.

In all services, the total number of donors for these two years in pandemics is 11098 donors of which donors' volunteers 9478 (85.41%), family 1620 (14.59%). We can say that we have been working hard for the eradication of family blood donation, and just when we were ready, the pandemic hit us reversing the process in the next two years, where we have a significant ($p < 0,05$) increase in family donation again by almost 13%.

Table 2. Donation numbers before and during the pandemic period of different countries

Location	Time frame (2020)	Before pandemic	During pandemic	No. of total cases	Population of region	Ref.
Apulia, Italy	March 19/March 20	18,100	16,200	2,077 (Apulia)	4,008,296	[12]
Zhejiang, China	Feb 19/Feb 20	15,609	5,253	1205 (Feb 26)	1,935,000	[13]
Guangdong province	Jan to Mar 19/Jan to Mar 20	56,100 (26,400 same time frame before measures)	48,800 (17,800 before measures)	1,501 (March 31, Guangdong province)	13,302,000 (Guangdong)	[14]
Dehradun, Uttarkhand, India	Jan-early Feb Feb-March	1,343	600	7/1,559 (Uttarkhand/ India)	11,701,989 (Uttarkhand)	[15]
India (1 unknown center)	March 20 – April 20	877	613	724 (march 27)	30,291,000 (Delhi)	[16]
Bisha, Saudi Arabia	Sept-Dec 19/Jan-May 20	1,360	1,009	22,752 (May 1)	34,813,871	[17]

a Numbers obtained from 38 blood centers. b Actions were made after January 30, 2020, thereby increasing donations. c Research separated their data between two phases. The first phase was between October 2019 and the middle half of February 2020. The second phase was between the late half of February to June. Only the numbers added in this table were from January to the first half of February 2020 and first half of February to March. d Lockdown started after March 25.

Source: Chiem C, Alghamdi K, Nguyen T, Han J, H, Huo H, Jackson D: *The Impact of COVID-19 on Blood Transfusion Services: A Systematic Review and Meta-Analysis. Transfus Med Hemother* 2021. doi: 10.1159/000519245

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Another interesting aspect of this retrospective study is that we have fewer students who donate blood. According to the statistics and our observation, this is a result of the lockdown and online teaching, which paralyzes the institute of transfusion because the motor of the process of recruiting new donors depends on the communication and the activity of the medical students during awareness campaigns. The gap left by students and other professions was filled with the increase of health professionals donating blood, and we hope that this trend will continue.

4. Conclusion

From the obtained results we can see a permanent increase in the number of voluntary donors even in times of the pandemic with Covid-19.

Additional activities are needed to motivate the Albanian population female and unemployed to donate blood, which will help in increasing blood reserves in the central regional center for transfusion medicine in Tetovo and other centers, focusing more on launching initiatives and policies that would increase their countries' blood supply.

The positive view of donors and health professionals reflected in overcoming the crisis without the consequences we could have imagined at the beginning of it, by improving blood availability and solving blood shortages in emergencies such as the current COVID-19 pandemic.

Activating a mobile blood drive is critically seen by our institute to implement and bridge the gap between blood supply and demand if the crisis continues.

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