

BLOOD DONATION PRACTICE AND RELATED FACTORS AMONG HEALTH CARE PROFESSIONALS IN THE TRANSFUSION SYSTEM

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Abstract: Health care in the field of transfusion hematology occupies an extremely important place in modern medicine. This specialized field aims to ensure safety and efficacy in procedures involving the donation, processing and use of blood and its components. Transfusion hematology (TH) is central to the maintenance of public health and is an indispensable element in the treatment of patients with a variety of medical conditions, including blood disorders, oncological diagnoses, surgical interventions and emergencies. An important role in this process is played by medical professionals, who not only provide efficient and safe health care delivery for blood donors and recipients but can also be active participants in the process as blood donors. Their willingness to donate blood can serve as an example for other members of society, especially for the younger generations. The aim of this study is to investigate and analyze the determinant factors that influence blood donation among healthcare professionals (HPs) working in the field of TH.

The study covers both the personal attitudes and motivations of these professionals towards donating blood, as well as the barriers and incentives that influence their attitudes and behavior. The study employed a direct, individual and anonymous survey among 108 HPs (nurses, medical laboratory assistants and feldshers) working in various structural units of the National Transfusion System, located in the cities of: Sofia, Burgas, Pleven, Sliven, Kyustendil, Blagoevgrad, Vratsa, Lom and Vidin. The study was conducted from October 2022 to March 2024. Data was collected as part of primary and secondary research using sociological and statistical methods for analysis, while findings were presented graphically.

The results obtained from the study have shown that all respondents are women, 58 of them (53.7%) work in different departments of Transfusion Hematology across the country. Most respondents, 75% (81 out of 108), meet the age requirements for donating blood in the country. Overall, respondents' attitude towards the act of donating blood is positive, most respondents 66 (61.1%) have donated blood in the past. Key factors influencing blood donation practice among medical professionals are age, health status, lack of free time, lack of direct invitation to donate blood; personal and emotional factors, such as helping a loved one, responding to emergencies, desire for social recognition, as well as long professional experience in the medical field.

The research found that health professionals are aware of critical situations where blood is needed and can respond quickly if needed. Their role in the healthcare system makes them more likely to participate voluntarily unpaid in blood donation initiatives. Medical professionals' main motivation for donating blood is focused on the emotional and social aspect of donating.

Keywords: attitudes, motives, factors, blood donation, medical professionals

1. INTRODUCTION

The primary task of any National Transfusion System is to ensure the timely and sufficient supply of high-quality and safe blood products. This would be impossible without the participation of voluntary and unpaid blood donors.

The need for donor blood remains very high in all countries worldwide. According to the WHO, there is a constant global blood shortage of approximately 20%, varying from 5% to over 40% depending on the country and the level required to meet clinical and production needs. (World Health Organization. Blood safety and availability. Published

June 2, 2023) The significant global challenges include an aging population and an increase in chronic diseases, which lead to a decrease in blood donors and an increase in blood shortages (Ali *et al.*, 2010; Greinache *et al.*, 2010; Greinache *et al.*, 2018). On the other hand, many medical interventions, such as surgeries, trauma treatments, and cancer therapies, often require large amounts of blood (Bruun *et al.*, 2016; Jennings *et al.*, 2023; Patil & Shetmahajan, 2014). Therefore, everyone must recognize the importance of blood donation.

Transfusion systems (TS) worldwide strive to implement various strategies to increase the number of blood donors, and medical professionals working in healthcare institutions can serve as an important reserve for blood donation. Due to their knowledge and expertise in a specialized field such as transfusion hematology (TH), nurses and medical laboratory technicians working in this specialty can successfully promote blood donation and donate blood or blood components themselves in emergency and crisis situations. The COVID-19 pandemic is a recent example of medical professionals actively participating as blood donors, demonstrating their professionalism, empathy, and social responsibility. During the pandemic, many countries reported an initial decline in donor activity due to movement restrictions and fear of infection, leading to decreased blood reserves. (Sahu *et al.*, 2020; Sahu *et al.*, 2022; Thakur *et al.*, 2023) Due to the need for new therapeutic methods for COVID-19 patients, convalescent plasma (CCP) treatment was introduced. Between 2020 and 2022, a total of 279 units of hyperimmune plasma were transfused at the clinics of Military Medical Academy (MMA) in Sofia in an attempt to treat COVID-19 patients. These units were produced at the Center for Transfusion Hematology at the MMA (Terzieva *et al.*, 2023). Approximately one-quarter of CCP donors were medical professionals (doctors, nurses, and laboratory technicians) who had recovered from COVID-19 and worked in healthcare structures. CCP was one of the most widely used treatments at the beginning of the COVID-19 pandemic. The results of currently available randomized studies suggest that high-titer CCP is effective only when administered early after symptom onset (<72 hours), when the viral load is relatively low, and before inflammatory damage becomes evident. (Tobian *et al.*, 2022).

Blood donation is a fundamental component of the healthcare system, ensuring vital reserves of blood and blood components necessary for treating patients in various medical situations. It represents both an act of solidarity and voluntarism and a strategic element for guaranteeing public health and security. Although the primary model in Bulgaria is voluntary and unpaid blood donation (**Law on Blood, Blood Donation, and Blood Transfusion**, promulgated in State Gazette No. 102 of November 21, 2003), which is encouraged through national campaigns and programs, family blood donation (where donors provide blood to support the treatment of their relatives) plays a leading role in blood and blood component supply. The number of donors remains below the WHO's recommended levels (World Health Organization, Global Status Report on Blood Safety and Availability, Geneva: WHO; 2017). Statistics show that approximately 75-80% of blood in Bulgaria is still obtained through replacement donation. There is a trend of increasing first-time donors, with a stable distribution of blood donations by age. According to the National Center for Transfusion Hematology (NCTH), in 2023, 173,177 blood donations were carried out, representing an increase of approximately 2.59% (168,807) compared to 2022 and 8.37% (159,804) compared to 2021 (www.ncth.bg). The increase is related to changes in the country's anti-epidemic measures. In contrast, due to the complicated epidemiological situation caused by COVID-19, blood donations in 2020 sharply declined compared to 2019, from 170,163 to 150,432 (www.ncth.bg). This was due to the suspension of mobile blood donation teams to prevent donations outside the controlled environment of Transfusion Hematology Centers and Departments.

In Bulgaria, very few studies have been conducted on community-level blood donation (Ivanova, 2021; Todorova, 2019). To our knowledge, only one previous study has examined voluntary and unpaid blood donation among nurses working in TH. When developing long-term blood supply strategies, healthcare professionals are a desirable group of donors. They are familiar with the requirements and procedures for blood donation, as well as its minimal risks and health benefits.

2. OBJECTIVE

This study aims to explore and analyze the factors influencing blood donation among healthcare professionals (HPs) working in the field of TH.

3. MATERIALS AND METHODS

A direct, individual, and anonymous survey was conducted among 108 HPs (nurses, laboratory technicians, and paramedics) working in various structural units of the National Transfusion System (TS) located in the cities of Sofia, Burgas, Pleven, Sliven, Kyustendil, Vratsa, Lom, and Vidin. The survey period was from October 2022 to March 2024. The study employed documentary, sociological, and statistical methods.

For statistical processing, information analysis, and graphical representation of results, Microsoft Excel in Windows 10 was used.

4. RESULTS

The study included 108 HCPs working in the TS structure, of whom 56 (51.9%) were nurses, 49 (45.4%) were laboratory technicians, and three were paramedics. All respondents were women. Of the total participants, 43 (39.8%) were in the 51-60 age group, followed by 27 (25.0%) over 60 years old and approximately the same percentage (24.1%) in the 40-50 age group. Thirty-nine HCPs (36.1%) had over 20 years of experience in the TS, while 81 (75%) had over 20 years of experience in the healthcare system.

Table 1. Socio-demographic characteristics of Healthcare Professionals

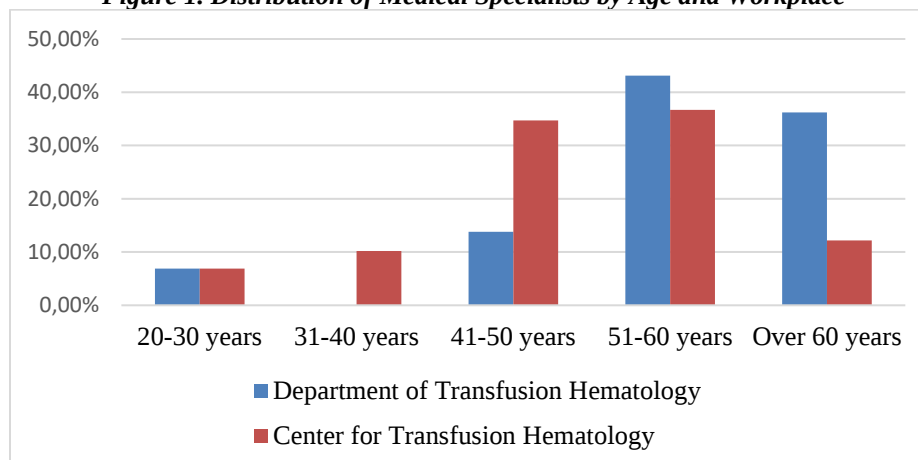
Variables	Category	Frequency	Percentage
Age	20 - 30	7	6,5
	31 - 40	5	4,6
	41 - 50	26	24,1
	51 - 60	43	39,8
	Over 60	27	25,0
Profession	Nurse	56	51,9
	Medical laboratory technician	49	45,4
	Paramedic	3	2,8
Education	Associate degree	46	42,6
	Bachelor's in Health Care	31	28,7
	Bachelor's in Health Care Management	12	11,1
	Master's in Health Care Management	19	17,6
Workplace	Transfusion Department	58	53,7
	Blood Transfusion Center	50	46,3
Total Work Experience (years)	up to 5	6	5,6
	6 - 10	7	6,5
	11 - 20	14	13,0
	over 20	81	75,0
Experience in Transfusion System (years)	1	4	3,7
	2 - 5	25	23,1
	6 - 10	22	20,4
	11 - 20	18	16,7
	over 20	39	36,1
Total Respondents		108	100%

Source: Author's study

In Bulgaria, blood donation is permitted for individuals aged 18 to 65 years (**Law on Blood, Blood Donation, and Blood Transfusion**, promulgated in State Gazette No. 102 of November 21, 2003). Individuals over 60 must have a history of regular blood donation and be in good health to continue donating. In our study, 81 respondents (75%) met the age requirements for blood donation (Table 1). This can be interpreted as a positive indicator of the blood donation potential among HCPs, but other factors such as health status, motivation, and awareness also influence their willingness to donate.

In Figure 1, the trends in the distribution of medical specialists in Transfusion Hematology Departments (THD) and Transfusion Hematology Centers (CTH) by age group are presented. The most active age groups are those between 41 and 60 years, with THD peaking in the 51-60 age group, while in CTH, the highest representation is among specialists aged 41-50 years. The lowest participation in both categories is observed among young professionals (20-30 years old), highlighting the need for strategies to attract and train young personnel.

Figure 1. Distribution of Medical Specialists by Age and Workplace



Source: Author's study

To develop a sustainable blood donation promotion program, it is essential to systematically examine the motives and reasons for blood donation in each population, as these motives can vary significantly. (Table 2)

Table 2. Blood Donation Practices and Related Factors

Variable	Frequency	Percentage
Number of Donations		
Only once	22	20,4
Two or more times	44	40,7
Reason for Donation		
Treatment of a close person – friend, relative	23	21,3
Blood donation campaign	34	31,5
Appeal for a specific person in need of blood donors	5	4,6
Other: voluntary	6	5,6
Feeling After Blood Donation		
Sense of satisfaction	55	83,3
Discomfort	4	6,1
No particular feeling	7	10,6
Have any of your family members donated blood?		
No	20	18,5
I don't know	7	6,5
Yes	80	74,1
Motivating Factors for Blood Donation		
The need of a close person for blood products	59	63,7
Emergency situations with multiple casualties – disasters, accidents	40	43,20
Media campaign	13	14,00
To receive recognition	30	32,4
Other: voluntary, altruistic	12	13,0
To take advantage of the opportunity for paid leave	6	6,5
Material benefit	4	4,3

Source: Author's study

*Note: The percentage of motivating factors for blood donation exceeds 100% due to multiple responses

Sixty-six respondents (61.1%) reported having donated blood at least once, with 44 (40.7%) having donated two or more times. Medical professionals share that, as healthcare specialists, they recognize the importance of organized campaigns in addressing the shortage of blood and blood products. Thirty-four of them (31.5%) participated in

campaigns organized by the healthcare institutions where they work or with which they are affiliated. These campaigns likely have a strong informational value, motivating professionals to participate collectively.

Treatment of a close person (friend, relative) is the second most common reason for blood donation, with 23 responses (21.3%), while only 6 (5.6%) donated blood voluntarily, without a specific reason. Eighty respondents (56.3%) who have ever donated blood report feeling comfortable after donation.

Seventy-three (71.4%) of all participants stated that one or more family members had donated blood. Among all respondents, 63% indicated that their leading reason for future blood donation would be the need of a close person for blood products. The second most significant reason is related to providing assistance in emergencies (43.5%), reflecting a sense of empathy and solidarity in society. Social recognition (32.4%) also plays an important role in motivation.

Although less pronounced, altruistic motives (13%) and the influence of media campaigns (11.1%) can have some impact. Some medical professionals would consider blood donation as an opportunity for a short break, but this motivation is weakly expressed (6.5%). Material benefit is the least significant factor (4.6%), indicating that financial incentives are not an effective way to attract blood donors.

5. DISCUSSION

Our study identified a higher blood donation rate among medical professionals (61.1%) compared to previous studies conducted in Turkey (31.6%) (Ekşi et al., 2022), Nigeria (41.4%) (Nwogoh et al., 2013), and Ethiopia (36% and 47.8%) (Teferi et al., 2021; Tadesse et al., 2018). While medical professionals play a key role in blood donation, several barriers may prevent their active participation in donor campaigns (Arshad et al., 2024). These barriers may be personal, professional, organizational, or social and relate to both individual attitudes and external circumstances affecting their decision to donate blood. The aging workforce in the TS is a significant concern. Statistical analysis revealed that TS staff in Hospital Transfusion Departments (HTDs) were significantly older than those in Blood Transfusion Centers (BTCs) ($p < 0.05$; $p = 0.00046$). Aging personnel are often associated with comorbidities that contraindicate blood donation. Among blood donors, 55 (83.3%) reported feeling satisfied after donating. The majority expressed willingness to donate again, with key motivating factors including "a relative's need for blood" (63%), "emergency situations with mass casualties" (43.5%), and "social recognition" (32.4%). The primary reasons for refusal to donate included health issues, a busy work schedule, lack of a personal invitation, and fear of fainting. All respondents unanimously agreed that organizing donor campaigns in healthcare facilities would significantly promote blood donation among medical professionals.

6. CONCLUSION

The results emphasize the importance of motivating and engaging medical professionals in regular blood donation through organized donation campaigns in healthcare facilities, personalized approaches, and increased awareness while addressing existing barriers related to health and workload. Improving communication and motivation through personal invitations and management-supported campaigns, emphasizing the emotional and social aspects of blood donation, is crucial to attracting HPs to this cause.

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