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Distribution of Blood Groups and Willingness to Donate Among College Students of West Tripura

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Abstract

Background: *For the blood bank to survive and continue providing transfusion services, students' willingness to donate blood and their understanding of their own blood type and rhesus factors are essential. Knowing a student's blood group is crucial since it allows them to donate blood in an emergency. The current study aims to ascertain college students' distribution of ABO blood and rhesus groups, as well as to boost their desire to donate blood by increasing their knowledge with their blood group.*

Methods: *In March 2024, 231 students from Bhavan's Tripura College of Science and Technology in west Tripura, ages 19 to 22 years, participated in this cross-sectional survey. ABO type results and the Rh factor were included to the self-administrated questionnaire that was used to gather the data. All the data was analysed by excel and SPSS software.*

Results: *The most frequent blood types among the students in this study were found to be group B (33.76 %) and O (31.16%), followed by group A (29.87 %). While 5.19 percent of students are Rh negative, the bulk of students about 94.80 percent, belong to the Rh-positive factor. The majority of students (91.34%) accurately identified their Rh factor and ABO blood group when we asked them, and we compared their answers with the test results. Boys who have donated blood in the past are more likely to disclose their blood type than others. Merely 53.67 % of the entire study population expressed interest in donating blood in the upcoming year. Male donors have a more positive attitude about blood donation than female donors. At the same time, girls are also far less inclined to donate blood.*

Conclusion: *The research population exhibited a higher frequency of blood type B, O, and Rh positive. Although the majority of college students are well-informed about their blood type, less than half of them expressed interest in donating blood. Therefore, encouraging young college students to donate blood is our primary goal.*

Introduction

The most well-known blood type systems, ABO and Rhesus (Rh), are very much crucial for the safety of transplants and transfusions and also are associated with higher risk of certain illness [1]. In essence, human blood is an important component that can save millions of lives if it is made readily available. The World Health Organization (WHO) states that in order to satisfy the basic need for blood and blood products, at least 1% of the country's population should voluntarily give blood [2]. The importance of healthy individuals voluntarily donating blood was further emphasised by the WHO's 2000 AD theme, "Safe blood starts with me, blood saves lives."

About one-third of the approximately 8 million units of blood required annually in India come from volunteer donors [3]. About 45% of blood donations in India come from replacement donors, also known as family donors, who provide blood to friends, family, and other relations in times of need [2]. The World Health Organization emphasises that voluntary, unpaid blood donation must take the place of replacement blood donation, which should be avoided. Since January 1998, professional and paid blood donations have been prohibited in India.

In health-care settings, blood scarcity is a common occurrence that results from an imbalance between the growing demand for safe blood and blood products and the inability to organise a regular blood supply due to misinformation, perceived risks and harms, and low motivation among potential donors. Blood group frequencies varies throughout different ethnic group globally. Blood types O, A, B, and AB were distributed among Caucasians in the United States as follows: 45.0 %, 40.0 %, 11.0 %, and 4.0 %, respectively. The recorded frequencies for Hispanics were 57.0 %, 31.0 %, 10.0 %, and 3.0%, in that order. The distributions among Blacks were 50.0 %, 26.0 %, 20.0 %, and 4.0 %, in that order [4]. Blood group A was the most prevalent blood type in China (30.5%), followed by B (29.4%) and O (30.4%), with AB being the least common (9.7 %). Furthermore, the population's Rh-negative factor was just 1.02% [1].

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When blood replacement is necessary in both normal and emergency scenarios, blood-derived products are commonly employed as a life-saving therapy [5]. Knowing one's blood type is crucial, mainly because it matters in the event that an emergency transfusion is needed. The awareness rate differs from nation to nation, with the UK having a rate of 50.0 percent and Japan having a rating of 97.0 % [6].

Furthermore, the presence of health students from various blood types at the teaching hospitals might be a vital source of potential donors for a number of reasons. These students are more conscious of the local need for blood products, are often young and healthy, and have the advantage of being easily accessible to blood banks [6, 7]. There are national differences in the attitudes of health students concerning blood donation. Just 12.7% of health science students in Portugal have ever given blood, although 88.0 % of non-donors said they would if needed [8]. 16.8% of university students in Northwest Ethiopia gave blood willingly [9]. In India, 22.9 % of medical college students reported having previously donated blood, and the vast majority (91.0 %) said they would be willing to do so again [7].

Even while students generally have strong understanding and a positive attitude toward voluntary blood donation, certain studies have also found that students have poor blood donation practises [7, 10]. Current information about blood type patterns and the readiness of the youth population to donate blood is crucial for national health services. It is stated that among females, the incidence of voluntary blood donation is considerably lower. Investigating the many elements that may encourage voluntary blood donation is therefore necessary. In order to encourage these students to become routine, voluntary blood donors, this study was carried out to evaluate their knowledge gaps, attitudes, and blood donation habits.

Material and methods

Ethics

The study was given ethical approval by the Institutional Review Board committee of Bhavan's Tripura College of Science and Technology. After informing each participant of the study's goal and assuring them that there would be no adverse effects, the researcher got their signed agreement. The data's confidentiality was guaranteed. The Declaration of Helsinki's guiding principles were followed in this study [11].

Study Design, Setting, and Population

Following ethical clearance and informed permission, all students enrolled in March 2024 at Bhavan's Tripura College of Science and Technology in West Tripura (N=231) were included in this cross-sectional study.

Collection of Data

There were two parts to the data. A self-administered questionnaire made up the first section. Based on the goals of the study, the researchers constructed it after reviewing related studies and contemporary literature [6,12]. This section asked questions about sociodemographic characteristics, self-reported ABO and Rh blood groups, the participant's willingness to donate blood within the next year, and additional questions about allergies and chronic illnesses that might have an impact on the participant's willingness to donate or knowledge of their own blood type. The ABO and Rh typing result, which included ABO and Rh factors testing, made up the second section of the data. Participants' blood samples were drawn, and simultaneous ABO and Rh blood type tests were conducted using reagents (anti-A, anti-B, and anti-D). The technique for determining blood type was red blood cell agglutination. The investigators contacted the students and gave them the structured questionnaire before drawing blood.

Data analysis

The statistical analysis was performed using excel and statistical package for social science (SPSS) software.

Resuts

The survey had 231 students in total, with 112 (48.48 %) boys and 119 (51.52 %) girls. The mean age was 20.04 ± 1.05 years, with the age range being 19–21 years.

Overall, 33.76% and 31.16% of students had a blood group B and O respectively and making it the most common ABO blood group while the AB (5.19%) is the least common blood type. Additionally, 69 students (29.87 %) belonged to blood group A. The majority (94.8%) of students had Rh positive factor (Table 1). Regarding age and gender, there was no statistically significant variation in the ABO and Rh blood group types. The allergic condition (N=85) constituted a major part of these conditions. Other reported diseases included asthma (n=8), heart disease (n=2), thalassaemia minor (n=1)

Of the participants, 211 (91.34 %) knew what their blood group was. Of the students, just 20 (8.65%) did not know what their blood type was. The most often reported blood types were B (33.76 %), O (31.16%), A (29.87 %), and AB (5.19%). 5.19 % were Rh negative, while around 94.80 % reported being Rhesus antigen positive. Table 2 summarises the blood group distribution as reported by the students.

The participants said that educational institutions including schools and colleges accounted for 31.16% of their sources of knowledge on blood donation, followed by blood donation camps (23.38%), the internet (19.48%), friends (9.96%), television (7.79%), newspapers (4.76%), and parents (3.46 %). The results are shown in Figure 1.

Nearly 97% of research participants agreed that blood donation is a good idea and were willing to give themselves. Table 3 provides a summary of the findings.

Only 51 (22.08 %) of the 231 research participants had given blood previously. Only 6 (2.59 %) and 45 (19.48 %) of these were female and male respectively. Of the students, 16 (6.93 %) had given blood more than once, while 35 (15.15 %) had only done so once. Out of all the students, 41 (17.74 %) gave blood voluntarily, 9 (3.89 %) gave blood to a friend or family in need and were substitute donors, and 1 (0.43 %) gave blood so that his blood type could be checked for illnesses.

Table 1: Distribution of different blood groups among the participants (N=231)

Blood Groups	A+	A-	B+	B-	AB+	AB-	O+	O-
No of students	67	2	73	5	8	4	71	1
Overall %	29.00	0.87	31.60	2.16	3.46	1.73	30.73	0.43

Table 2. Distribution of different blood groups among the participants (N=231)

ABO Blood group		ABO typing result			
		A N (%)	B N (%)	AB N (%)	O N (%)
Self-reported	A	**62 (89.86)**	2(2.56)	2(16.67)	1 (1.39)
	B	2 (2.90)	**72 (92.30)**	1(8.33)	2(2.78)
	AB	2(2.90)	1(1.28)	**8 (66.67)**	0(0)
	O	1(1.45)	1(1.28)	1(8.33)	**69(95.83)**
	Not Sure	2(2.90)	2(2.56)	0(0)	0(0)
Rh group		**Positive N (%)**		**Negative N (%)**	
Self-Reported	Positive	**201(82.19)**		1(16.67)	
	Negative	16(9.58)		**9(58.33)**	
	Not sure	2(8.23)		2(25.0)	

Note: Correctly identified blood groups are in bold. Abbreviation: N, Number of participants.

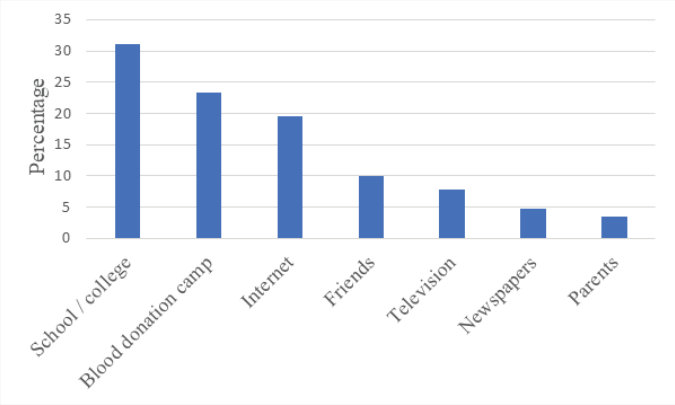

Figure 1. *Information sources on blood donation*

Table 3. *Study population's willingness to donate blood*

Willingness	Yes (%)	No (%)	Not sure (%)
Do you believe that individuals ought to give blood?	224 (96.97)	3(1.29)	4(1.73)
Do you want to give blood in the future?	124(53.67)	96 (41.55)	11(4.76)
Do you believe that giving blood might lead to infection?	21(9.09)	147(63.64)	63(27.27)
Would you want to give blood to just your friends and family?	13(5.63)	218(94.37)	0 (0)
Would you be willing to give blood to a complete stranger who needs it?	143(61.90)	71(30.73)	17(7.36)

The following justifications were provided by the 180 current nondonors (n=180) for not donating blood (Table 4).

Table 4. *Justifications for not giving blood*

Reason(n=180) for present nondonors' not giving blood	n (%)
I wasn't asked to give blood.	106 (58.89)
I am not fit to give blood	41 (22.78)
Aversion to needles	28 (15.55)
In the future, I could have to give blood to friends or family.	4(2.22)
Fear of finding out one's condition when doing an infection screening	1 (0.56

Discussion

Knowing one's blood group is crucial, particularly in emergency situations where blood donation is required. While there is a dearth of information on this topic, the current study identified the frequencies of ABO and Rh blood types among undergraduate college students in Tripura. Furthermore, as far as we are aware, no prior research on knowing one's actual blood type has been conducted in Tripura. According to this survey, blood type B is the most common (33.76 %), followed

by blood groups O (31.26 %) and A (29.8 %), with type AB being the least common (5.19 %). Furthermore, 94.80% of the students were Rh-positive factor.

This study resembles with research from other states, and it particularly similar to the ABO and Rh blood types distribution of North India [7]. Blood banks require current information on the frequency of blood groups in the area in order to guarantee an adequate supply of blood products due to the high demand, particularly for the most in-demand blood types [13]. It has been previously noted that endogamy-practicing civilizations are typically genetically isolated. Genetic research, for example, has shown that certain endogamous communities in Bihar, India, have lower gene diversity and, consequently, lower variety in ABO and Rh blood types [14].

Globally, surveys and blood donation awareness initiatives have been used to enlist college students, particularly those in the health-care sector. According to this research, there is a significant difference in the effectiveness of blood donation centres in increasing voluntary blood donation motivation [15]. According to a study by Kumari and Raina, the top excuses given for not giving blood include needle phobia, the sight of blood itself, worries about potential side effects, family rejection, and "never been asked for" [16]. Respondents in a number of other research have voiced similar worries. [17-19].

Knowing one's blood type is crucial since it allows for the speedy preparation of blood for self and others in an emergency. 91% of the students in this survey knew about their blood types. Blood type awareness is also very prevalent, according to studies by Devi et al., [17], Nwabueze et al. (99.6%), [20], and Agravat et al (96%) [21]. The students said that the reason for their high degree of awareness of their own blood was that they had to fill out this information on their school identity cards and that it was related to a physiology experiment they had to complete in college. This study highlights the importance of educational institutions in disseminating knowledge and cultivating a positive mindset.

In the current study, the most prevalent blood type was "B" (33.76 %), which was followed by "O" (31.16%), "A" (29.87 %), and "AB" (5.19 %). Out of them, 5.19 % were Rh negative and 94.80 % reported being positive for the Rhesus antigen. Our results are consistent with research conducted in North India by Chandra and Gupta [22] and Maharashtra by Giri et al. [23]. Our study's subjects included members of every common and uncommon blood group. According to this research, students should be encouraged to donate blood voluntarily and should register with the blood bank so that they may be reached for donations in an emergency when there is a blood shortage, particularly for uncommon blood types.

According to the survey participants, educational institutions including schools and colleges accounted for 31.16% of their information regarding blood donation, which was followed by blood donation camps (23.38%), the Internet (19.48%), friends (9.96%), television (7.79%), newspapers (4.46%), and parents (3.46 %). This emphasises how important it is to focus more on blood donation awareness campaigns run by educational institutions and how this subject should be covered in curricula at schools and colleges.

Although 53.67 % of survey participants were willing to donate blood, over 96.97% of participants said that individuals should donate blood. A high percentage of prospective donors who are willing to donate is encouraging for voluntary blood donation. Nonetheless, 9.09 % of students believed that giving blood may result in illnesses, despite the fact that they generally felt positively about the practise. Although this may indicate participants' ignorance, it also implies that students may have a poor impression of the safety of donors and the calibre of blood bank services.

In this study, there were 15.15 % of blood donors; of them, 85.71 % were boys and just 14.29 % were girls. Studies by Kumari and Raina (13.81 %) [16] and Desai and Satapara have also produced findings that are similar (21.3 %) [24]. Our study adds to the body of research showing a low prevalence of blood donation (22.9%) despite favourable attitudes and high general knowledge (74.4%) [24,25].

During an interactive session with research participants, the prevalent reaction to this issue was that, while they were eager to donate blood, they were not eligible due to either being underweight (less than 45 kg) or having a minimum haemoglobin requirement of 12.5 g percent. Strict donor selection standards are necessary to guarantee donor safety, yet there is reason for worry given the high number of students who report anaemia and low body weight. The results of this study point to the need of treating nutritional deficiencies in college students seriously, as well as the necessity of deworming, iron and folic acid prophylaxis, and the availability of wholesome, fresh food in residence and canteens.

Conclusion

This research offers epidemiological data on the distribution of blood types, self-blood group knowledge, desire to donate blood, and related characteristics among undergraduate students at Bhavan's Tripura College of Science and Technology. The most common blood types were positive Rh type and ABO blood group B, which the majority of students were aware of. Furthermore, almost half of students expressed a willingness to donate blood in the upcoming year. Getting young people to donate blood is crucial, especially the female students. It's also advised that comparable studies be conducted throughout the state.

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Conflicts of interest

There are no conflicts of interest

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