



## KNOWLEDGE, ATTITUDE, AND PRACTICE TOWARDS VOLUNTARY BLOOD DONATION AND ASSOCIATE FACTORS AMONG KHULNA UNIVERSITY STUDENTS

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### Abstract

Voluntary blood donation (VBD) is the foundation of blood safety and safe transfusion methods. It is vital to boost volunteer donor recruitment and retention to ensure a long-term safe blood transfusion practice, especially among university students. The goal was to evaluate Khulna University students' blood donation knowledge, attitude, and practice (KAP) as well as associated factors. A cross-sectional study was conducted at Khulna University in April 2022. Using simple random sampling (SRS), 400 face-to-face interviews were taken, of which 394 records were used for further analysis. A Chi-square test was used to check the association between KAP toward VBD, and binary logistic regression was applied to identify the association between explanatory and outcome variables. The logistic regression reveals that students with good knowledge about VBD are associated with permanent residence (OR: 1.651; 95% CI: 1.028, 2.650) and education (OR: 1.746; 95% CI: 1.012, 3.014). Favorable attitude toward VBD is associated with gender (OR: 1.818; 95% CI: 1.073, 3.079), division (OR: 3.058; 95% CI: 1.241, 7.535) and social media time (OR: 0.068; 95% CI: 0.001, 0.876). The practice of VBD is associated with gender (OR: 5.375; 95% CI: 3.115, 9.273) and current residence (OR: 0.0397; 95% CI: 0.181, 0.869). Efforts should be undertaken to use knowledge and a favorable attitude toward students at the Khulna university to accomplish the aim of 100% VBD in the future.

**Keywords:** Knowledge, Attitude, Voluntary blood donation, Khulna university students.

### Introduction

Blood donation that is unpaid and non-remunerated is referred to as voluntary blood donation (Voluntary blood donation - national AIDS control organization, 2007). Blood donation is a life-saving gift that improves health and decreases early mortality. One's donated blood can save a life in an emergency, and it can also aid patients who require long-term treatment (Waheed et al., 2015). To eliminate blood shortage and assure the supply of safe and high-quality blood and other blood components, year-round voluntary blood donation is critical. This will result in the reduction of human suffering, even in the most remote parts of the country (Uma et al., 2013).

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Every year, around 112.5 million units of donated blood are collected worldwide. Over half of these are collected in high-income nations, and the average blood donation rate in high-income countries is nearly nine times higher than in low-income countries (Lownik et al.,2012). In industrialized countries, the average contribution rate is 38.1 donations per 1000 people (range 4.92–68.01), whereas, in underdeveloped countries, the average donation rate is 2.3 (range 0.40–7.46). (Urgesa et al., 2017). The majority of the 500,000 women who die each year during pregnancy and delivery reside in underdeveloped nations, with hemorrhage, which inevitably necessitates blood transfusion, the leading cause of maternal fatalities (Ahmed et al.,2014). By the WHO information, 1% of the population generally donates blood from a South Asian country. However, the people of this area contribute 15% (14.86 million) of world blood donation. Of this donated blood, 83.7% comes from voluntary non-remunerated donations (Manikandan et al.,2013).

In Bangladesh, more than 70% of annual demands for blood were collected from paid donors till 2001 (Ahmed et al.,2014). According to a report from Bangladesh Blood Transfusion Service, (BTS) majority of the people are collecting blood from patient's relatives and friends, indicating that 85% of blood is taken from relatives/family blood donors and only 15% from voluntary non-remunerated blood donors (Choudhury,2011). There were no donors under the age of 18 recruited; 80% of donors were between the ages of 18 and 24, and 20% were between the ages of 25 and 44. Between the ages of 44 and 60, no donations have been documented. In Bangladesh, around 600,000 units of blood are required each year. This forecast is based on the year 2010. According to SBTP (2010), 70% of blood is obtained from directed or relative blood donors, the remainder coming from voluntary blood donors (Situation Assessment of Public and Private Blood Centres in Bangladesh).

In every civilization, youngsters are the most likely to be blood donors especially university students constitute a significant percentage of this cohort (Ugwu et al., 2019). Because university students are young and educated, they are regarded as safer blood donors by the country's national and regional blood banks, as the residual risk of transfusion-transmissible illnesses is deemed to be lower in this demographic (Suen et al., 2020). However, some studies have found that more than two-thirds of university students around the world had donated blood in the past for various reasons, although many no longer do (Salaudeen et al.,2013, Elias et al., 2011, Baig et al., 2013).

All blood transfusion facilities prioritize increasing the level of knowledge, attitude, and practice toward blood donation among university students. The first step in achieving this aim is to conduct extensive research to assess the present state of intention (awareness, knowledge, motivation, and both positive and negative attitudes of the people about blood donation), as well as to determine the reasons for not donating blood. The current scenario of voluntary blood donation among Khulna university students has not been performed yet. So, our goal is to assess several aspects such as knowledge, attitude, and practices related to voluntary blood donation and the factors associated with those aspects among Khulna University students so that the number of safe blood donors can be increased at the university level by taking necessary steps according to our findings.

## **Materials and Methods**

### ***Data source and study design***

We extracted data from Khulna University as all the students of this university were our target population. Here, the total number of students is known, so a simple random sampling technique has been applied for sample collection. A cross-sectional study was conducted in April 2022, and data were collected through face-to-face interviews with a well-structured questionnaire. Four hundred responses were recorded with their valuable information and hospitality. The records of 6 respondents were omitted from this study because some necessary variables were missing in those records. After removing the missing values, there were 394 records left as our primary data with a 98.25% response rate. These data were used to perform our further analysis.

### **Sample size determination**

There are a total of 6965 students at Khulna University. We have used the Cochran formula for sample size calculation (Woolson et al., 1986)

We know,

$$n_0 = \frac{z^2 \times p \times (1-p)}{d^2}$$

and

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

$n$  = required sample size;  $p = 0.5$ ; estimated proportion of the population;  $q = 1 - p$ ;  $z = 1.96$ ; for 95% confidence level;  $d = 0.05$ ; margin of error. So, our sample size would be

$$n_0 = \frac{1.96^2 \times 0.5 \times (1 - 0.5)}{(0.05)^2} = 385$$

$$n = \frac{385}{1 + \frac{(385 - 1)}{6965}} = 365$$

We need at least 365 respondents for the analysis, and but we have collected data from 400 respondents.

### **Dependent variables**

The knowledge, attitudes, and practices about VBD were investigated in this study. The categories for knowledge are "knowledgeable" and "not knowledgeable," the categories for attitude are "favorable" and "unfavorable," and the categories for practice are "donated blood at least once" and "never donated blood."

### **Independent variables**

Age of the respondent (years), gender, educational status, permanent residence, current residence, marital status, smoking status, district, academic pressure, parent's education, parent's occupation, family income, and expenditure, earning members, family members, personal income source, blood group, the reason to or not to donate blood and depression status (PHQ-2) are independent variables.

### **Statistical Analysis**

Specifically, to interpret the terms: knowledge, attitude, and practice toward VBD, our study used primarily three forms of analysis, namely: Univariate analysis, Bivariate analysis, and Multivariate analysis, which are descriptive statistics (frequencies, percentages), chi-square and t-test, and binary logistic regression expressed as odds ratios (OR) with a 95% confidence interval. Microsoft Excel-2019 was used for data input, and analysis was done using STATA version 14.

### **Chi-square test ( $\chi^2$ )**

The form chi-squared statistic is quite intuitive, which is given below:

$$\chi^2 = \sum_{i=1}^n \frac{(O_i - E_i)^2}{E_i} \quad (1)$$

Pearson released a paper in 1900 on the Chi-square ( $\chi^2$ ) test has since formed the foundation for statistical analysis that investigates the goodness of fit (Chi-Squared Test - Wikipedia, n.d.).

### **Binary logistic regression model**

The link between a dependent discrete variable with two potential outcomes and one or more independent variables may be investigated using Logistic Regression analysis (maybe continuous, discrete, or a mixture of all types). (Pituch & Stevens, 2020).

The logit link has the form:

$$\log\left(\frac{p_i}{1-p_i}\right) = \text{logit}(P_i) = \beta_0 + \beta_1 x_i$$

### Odds ratio

The odds of an event occurring is distinct as the probability of the event occurring as a proportion to the probability of the event not occurring.

$$\text{Odds} = \frac{\text{Probability of event}}{\text{Probability of non - event}}$$

OR >1 indicates the increased occurrence of an event; OR <1 indicates decreased occurrence of an event; OR=1 indicates no chance of occurrence of an event.

## Results

### Univariate analysis

The frequency of knowledge, attitude, and practice is shown in Table 1. Among 394 respondents, 237(60.15%) respondents were not knowledgeable, and 157(39.85%) respondents were knowledgeable. 79(20.05%) respondents had an unfavorable attitude, and the others 315(79.95%) had a favorable attitude toward VBD. 187(47.46%) respondents donated blood at least once, and 207(52.54%) never donated blood. The blood group of the respondents had categories 8(2.03%) respondents had not sure about the blood group, 109 (27.66%) persons had the blood group A+, 106(26.90%) had the blood group B+, 110(27.92) had the blood group O+, 39(9.90%) had the blood group AB+, 4(1.02%) had the blood group A-, 9(2.28%) had the blood group B-, 9(2.28%) had the blood group O- and no one had the blood group AB-.

Table 1. Frequency table of selected variables

Variable	Category	Frequency	Percent
Respondents' knowledge about VBD	Not Knowledgeable	237	60.15
	Knowledgeable	157	39.85
Respondents' attitude toward VBD	Unfavorable Attitude	79	20.05
	Favorable Attitude	315	79.95
Blood donation status of the respondents	Never donated blood	207	52.54
	Donated blood at least once	187	47.46
	Not sure	8	2.03
	A+	109	27.66
	B+	106	26.90
	O+	110	27.92
The blood group of the respondents	AB+	39	9.90
	A-	4	1.02
	B-	9	2.28
	O-	9	2.28
	AB-	0	0

The number of donors as a whole Table 2 shows that 108(57.75%) respondents donated blood regularly, and 79(42.25%) respondents did not donate blood regularly. 58(31.02%) respondents donated blood to their family members, and 129(68.98%) respondents did not. 68(36.36%) respondents donated their blood

to their friends, and 119(63.64%) respondents did not. 132(70.59%) respondents donated their blood to others, and 45(29.41%) respondents did not donate their blood to others. Among the donors, 167(89.30%) respondents did not take money for donating blood; on the other hand, 20(10.70%) respondents took the money. When the donor went to donate blood, 94(50.27%) respondents did not get the travel cost, 81(43.32%) respondents sometimes got the travel cost, and 12(6.42%) respondents always got the travel cost from the blood recipient. When the donors gave blood, 21(11.23) respondents did not get proper care, 76(40.64%) respondents often got the proper care, and 90(48.13%) respondents got proper care from the blood recipient.

Table 2. Frequency table of donors (total 187 as 100%) on several covariates

Questions toward donors	Category	Frequency	Percent (%)
Do you donate blood regularly?	No	79	42.25
	Yes	108	57.75
Did you donate blood to family members?	No	129	68.98
	Yes	58	31.02
Did you donate blood to friends?	No	119	63.64
	Yes	68	36.36
Did you donate blood to others?	No	45	29.41
	Yes	132	70.59
Did you take money for donating blood?	No	167	89.30
	Yes	20	10.70
Have you got your travel cost from the blood recipient?	No	94	50.27
	Often	81	43.32
	Always	12	6.42
Have you got proper care from the blood recipient?	No	21	11.23
	Often	76	40.64
	Always	90	48.13

Table 3 shows that the main reasons for donating blood accordingly to the donors were 137(73.26%) respondents donated their blood to save a life, 73(39.04%) respondents donated their blood for their physical benefits, 32(17.11%) respondents donated their blood for their free medical check-up, 98(52.41%) respondents donated their blood for social work, 31(16.58%) respondents donated their blood for others reasons.

Table 3. Frequency table of reasons behind practicing VBD (187 donors as 100%)

Reasons for blood donation	Category	Frequency	Percent (%)
To save life	No	50	26.74
	Yes	137	73.26
For own physical benefits	No	260	60.96
	Yes	73	39.04
To get a free medical checkup	No	155	82.89
	Yes	32	17.11
Social work	No	89	47.59
	Yes	98	52.41
Others	No	156	83.42
	Yes	31	16.58

Assuming those who have never donated blood as a whole, Table 4 shows the main reasons for never donating blood. Accordingly, to the non-donors, there were 30(14.49%) respondents who did not know where to donate the blood, 24(11.59%) respondents did not know about the importance of blood donation, 58(28.02%) respondents had anemia, and 84(%) respondents had a fear of blood donation process. 4(1.93%) had different religious views, and 6(2.9%) thought there would be blood misuse. 39(18.84%) did not have enough knowledge about VBD, and 4(1.93%) thought blood donation was a waste of time.

Table 4. Frequency table of reasons behind not practicing VBD (207 non-donors as 100%)

Reasons for not donating blood	Category	Frequency	Percent (%)
Do not know where to donate	No	177	85.91
	Yes	30	14.49
Do not know about the importance of blood donation	No	183	88.41
	Yes	24	11.59
Anemia	No	149	71.98
	Yes	58	28.02
Fear of blood donation process	No	123	59.42
	Yes	84	40.58
Social/Religious issue	No	203	98.07
	Yes	4	1.93
Misuse of blood in hospitals	No	201	97.1
	Yes	6	2.9
Do not have enough knowledge about voluntary-blood donation	No	168	81.16
	Yes	39	18.84
Blood donation is a waste of time	No	203	98.07
	Yes	4	1.93

### ***Bivariate analysis***

Table 5 shows the result of the bivariate analysis. Chi-square distribution is used for categorical variables and a t-test for numeric variables. For knowledge age, permanent residence, and division were statistically significant. For attitude toward VBD, gender, division, and social media time are statistically significant. Age, gender, current residence, education status, marriage, personal income, and smoking were significantly associated.

For knowledge, the average age of respondents is 21.76 years with an SD of 0.13 who are knowledgeable about VBD. About 66.24% of respondents had permanent residence in the urban area. More than half of the respondents were from the Khulna division (62.45%) who have VBD knowledge. Students in the 2nd year are more knowledgeable about VBD (42.04%). Students with 30k-50k family income have more knowledge (28.03%) than others.

For attitude, male students have a more favourable attitude (68.25%) toward VBD. Most of the respondents were from the Khulna division (57.78%) who have a favourable attitude toward VBD, and 32.06% spend 1-2 hours on social media.

For practice, the average age of respondents is 21.91 years with SD 0.14 who donated blood at least once. Most donors are male (83.42%) and currently living at home (46.52%). The majority of the donor is in the 2nd year (39.04%) and unmarried (93.05%). Most donors have no personal income (136%) and are a non-smoker (72.19%).

### ***Multivariate analysis***

*Knowledge:*

The LR results of the different associated risk factors for knowledge about VBD are presented in Table 6. The table shows that personal residence and education are statistically significant for knowledge ( $p < 0.05$ ). The logistic regression reveals that respondents from the urban area are almost 1.6 times more knowledgeable than

Table 5. Cross-table for Knowledge, Attitude, and Practice with independent variables

Variables		Knowledge			Attitude			Practice		
		Not Knowledgeable	Knowledgeable	p-value	Unfavourable	Favourable	p-value	Never	At least once	p-value
Age		21.24±0.12	21.76±0.13	0.002**	21.24±0.15	21.50±0.10	0.12	21.03±0.11	21.91±0.14	0.000***
Gender	Male	80(33.76)	56(35.67)	0.696	43(54.43)	215(68.25)	0.021*	102(49.28)	156(83.42)	0.000***
	Female	157(66.24)	101(64.33)		36(45.57)	100(31.75)		105(50.72)	31(16.58)	
Permanent residence	Urban	121(51.05)	104(66.24)	0.003**	50(63.29)	175(55.56)	0.214	115(55.56)	110(58.82)	0.513
	Rural	116(48.95)	53(33.76)		29(36.71)	140(44.44)		92(44.44)	77(41.18)	
Division	Barisal	9(3.80)	9(5.73)	0.033*	4(5.06)	14(4.42)	0.009**	10(4.83)	8(4.29)	0.369
	Chittagong	5(2.11)	9(5.73)		1(1.27)	13(4.13)		8(3.86)	6(3.21)	
	Dhaka	39(16.46)	34(21.66)		18(22.78)	55(17.46)		32(50.46)	41(21.93)	
	Khulna	148(62.45)	73(46.50)		39(49.37)	182(57.78)		127(61.35)	94(50.27)	
	Mymensingh	2(0.84)	3(1.91)		4(5.06)	1(0.32)		2(0.97)	3(1.60)	
	Rajshahi	21(8.86)	12(7.64)		10(12.66)	23(7.3)		13(6.28)	20(10.70)	
	Rangpur	11(4.64)	16(10.19)		3(3.80)	24(0.95)		14(6.76)	13(6.95)	
Current residence	Sylhet	2(0.84)	1(0.64)	0(0)	3(0.95)	1(0.48)	2(1.07)			
	Hall	82(34.60)	58(36.94)	0.803	34(43.04)	106(33.65)	0.296	61(29.47)	79(42.25)	0.007**
	Rent House	40(16.88)	23(14.65)		11(13.92)	52(16.51)		42(20.29)	21(11.23)	
Home	115(48.52)	76(48.41)	34(43.04)		157(49.84)	104(50.24)		87(46.52)		
Religion	Muslim	186(78.48)	134(85.35)	0.199	64(81.01)	256(81.27)	0.567	160(77.29)	160(85.56)	0.103

	Hindu	50(21.10)	22(14.01)		14(17.72)	58(18.41)		46(22.22)	26(13.90)	
	Christian	0(0)	0(0)		0(0)	0(0)		0(0)	0(0)	
	Buddhist	1(0.42)	1(0.64)		1(1.27)	1(0.32)		1(0.48)	1(0.53)	
Education status	First year	117(49.37)	49(31.21)	0.004**	35(44.30)	131(41.59)	0.175	111(53.62)	55(35.41)	0.000***
	Second Year	67(28.27)	66(42.04)		30(37.97)	103(32.70)		60(28.99)	73(39.04)	
	Third Year	31(13.08)	19(12.1)		11(13.92)	39(12.38)		22(10.63)	28(14.97)	
	Fourth Year	15(6.33)	16(10.19)		3(3.80)	28(8.89)		11(5.31)	20(10.70)	
Academic pressure	Masters	7(2.95)	7(4.46)		0(0)	14(4.44)		3(1.45)	11(5.88)	
	Mild	21(8.86)	15(9.55)	0.964	10(12.66)	26(8.25)	0.471	19(9.18)	17(9.09)	0.999
	Moderate	111(46.84)	74(47.13)		35(44.23)	150(47.62)		97(46.86)	88(47.06)	
	Severe	105(44.30)	68(43.31)		34(43.04)	139(44.13)		91(43.96)	82(43.85)	
Father's education	Primary	46(19.41)	25(15.92)	0.123	13(16.46)	58(18.41)	0.345	31(14.98)	40(21.39)	0.103
	Secondary	47(19.83)	25(15.92)		10(12.66)	65(20.65)		39(18.84)	36(19.25)	
	Higher Secondary	48(20.25)	22(14.01)		15(18.99)	55(17.46)		45(21.74)	25(13.37)	
	Above	96(40.51)	82(52.23)		41(51.90)	137(43.49)		92(44.44)	86(45.99)	
Father's occupation	Gov.Job	48(20.25)	49(31.21)	0.054	22(27.85)	75(23.81)	0.901	48(23.19)	49(26.20)	0.898
	Private job	50(21.10)	36(22.93)		16(20.25)	70(22.22)		47(22.71)	39(20.86)	
	Business	92(38.82)	47(29.94)		27(34.18)	112(35.56)		73(35.27)	66(35.29)	

	Unemployed	47(19.83)	25(15.92)		14(17.72)	58(18.41)		39(18.84)	33(17.65)	
Mother's education	Primary	50(21.10)	33(21.02)	0.058	11(13.92)	72(22.86)	0.170	40(19.32)	43(22.99)	0.574
	Secondary	83(35.02)	36(22.93)		26(32.91)	93(29.52)		63(30.43)	56(29.95)	
	Higher Secondary	50(21.10)	41(26.11)		16(20.25)	75(23.88)		53(25.60)	38(20.32)	
	Above	54(22.78)	47(29.94)		26(32.91)	75(23.81)		51(24.64)	50(26.74)	
Mother's occupation	Gov. job	21(8.86)	21(8.86)	0.913	10(12.66)	23(7.30)	0.095	11(5.31)	22(11.76)	0.121
	Private job	9(3.80)	7(4.47)		2(2.53)	14(4.44)		10(4.83)	6(3.21)	
	Business	3(1.27)	3(1.27)		3(3.80)	3(0.95)		3(1.45)	3(1.60)	
	Housewife	204(86.08)	135(85.99)		64(81.01)	275(87.30)		183(88.41)	156(83.42)	
Family income	Below 20k	96(40.51)	38(24.20)	0.002**	24(30.38)	110(34.92)	0.814	79(38.16)	55(29.41)	0.311
	20k-30k	62(26.16)	40(25.48)		23(29.11)	79(25.09)		50(24.15)	52(27.81)	
	30k-50k	40(16.88)	44(28.03)		16(20.25)	68(21.59)		40(19.32)	44(23.53)	
	Above 50k	39(16.46)	35(22.29)		16(20.25)	58(18.41)		38(18.36)	36(19.25)	
Family expenditure	Below 20k	82(34.60)	35(22.29)	0.061	24(30.38)	93(29.52)	0.976	65(31.40)	52(27.81)	0.716
	20k-30k	93(39.24)	68(43.31)		31(39.24)	130(41.27)		86(41.55)	75(40.11)	
	30k-50k	45(18.99)	39(24.84)		18(22.78)	66(20.95)		41(19.81)	43(22.99)	
	Above 50k	17(7.17)	15(9.55)		6(7.59)	26(8.25)		15(7.25)	17(9.09)	
Earning members	More than one	60(25.32)	46(29.30)	0.383	16(20.25)	90(28.57)	0.136	49(23.67)	57(30.48)	0.128

	One	177(74.68)	111(70.70)		63(79.75)	225(71.43)		158(76.33)	130(69.52)	
Family members	>3	209(88.19)	139(88.54)	0.916	71(89.87)	277(87.94)	0.632	178(85.99)	170(90.91)	0.129
	≤3	28(11.81)	18(11.46)		8(10.13)	38(12.04)		29(14.01)	17(9.09)	
Only child	No	210(88.61)	139(88.54)	0.982	69(87.34)	280(88.89)	0.699	183(88.41)	166(88.77)	0.910
	Yes	27(11.39)	18(11.46)		10(12.66)	35(11.11)		24(11.59)	21(11.23)	
Marriage	Married	7(2.95)	3(1.91)	0.118	0(0)	10(3.17)	0.062	2(0.97)	8(4.28)	0.040*
	Unmarried	229(96.62)	149(94.90)		77(97.47)	301(95.56)		204(98.55)	174(93.05)	
	Divorced	0	3(1.91)		2(2.53)	1(0.32)		0(0)	3(1.60)	
	Widowed	1(0.42)	2(1.27)		0(0)	3(0.95)		1(0.48)	2(1.07)	
Personal income	No	49(20.68)	39(24.84)	0.311	67(84.81)	239(75.87)	0.088	170(82.13)	136(72.73)	0.025*
	Yes	188(79.32)	118(75.16)		12(15.19)	76(24.13)		37(17.87)	51(27.57)	
Smoking	Non-smoker	190(80.17)	129(82.17)	0.598	57(72.15)	262(83.17)	0.056	184(88.89)	135(72.19)	0.000***
	Occasional smoker	20(8.44)	9(5.73)		10(12.66)	19(6.03)		10(4.83)	19(10.16)	
	Smoker	27(11.39)	19(12.10)		12(15.19)	34(10.79)		13(6.28)	33(17.65)	
Social media time	Less than 1 hour	28(11.81)	18(11.46)	0.711	12(15.19)	34(10.79)	0.046*	22(10.63)	24(12.83)	0.709
	1-2 hours	71(29.96)	43(27.39)		13(16.46)	101(32.06)		59(28.50)	55(29.41)	
	2-3 hours	67(28.27)	53(33.76)		26(32.91)	94(29.84)		68(32.85)	52(27.81)	
	More than 3 hours	71(29.96)	43(27.39)		28(35.44)	86(27.30)		58(28.02)	56(29.95)	
Sleep hours	Less than 4	11(4.64)	7(4.46)	0.131	5(6.33)	13(4.113)	0.326	11(5.31)	14(7.49)	0.326

	4-6 hours	115(48.52)	67(42.68)		36(45.57)	146(46.35)		93(44.93)	89(47.59)	
	7-9 hours	92(38.82)	77(39.04)		30(37.97)	139(44.13)		96(46.38)	73(39.04)	
	More than 9 hours	19(8.02)	6(3.82)		8(10.13)	17(5.40)		7(3.38)	11(5.88)	
Depression	Not depressed	78(32.91)	49(31.21)	0.724	26(32.91)	101(32.06)	0.885	68(32.85)	59(31.55)	0.783
	Depressed	159(67.09)	108(68.79)		53(67.09)	214(67.94)		139(67.15)	128(68.45)	

(\*\*\*) indicates  $p < 0.001$ , (\*\*) for  $p < 0.01$ , (\*) for  $p < 0.05$

respondents from a rural area (OR: 1.651; 95% C.I: 1.028, 2.650). Students from the 2nd year are almost 1.7 times more likely to know about VBD than 1st year students (OR: 1.746; 95% C.I: 1.012,3.014).

Table 6. List of covariates adjusted for knowledge about VBD.

Variable	Category	OR	p-value	95% CI	
				Lower	Upper
Personal Residence	Rural (ref)				
	Urban	1.651	0.038*	1.028	2.650
Division	Barisal (ref)				
	Chittagong	2.061	0.344	0.460	9.221
	Dhaka	0.686	0.491	0.235	2.000
	Khulna	0.543	0.236	0.198	1.488
	Mymensingh	1.397	0.756	0.170	11.467
	Rajshahi	0.553	0.339	0.164	1.862
	Rangpur	1.282	0.699	0.363	4.518
	Sylhet	0.571	0.680	0.040	8.167
Education	1st year (ref)				
	2nd Year	1.746	0.045*	1.012	3.014
	3rd Year	1.080	0.845	0.498	2.343
	4th Year	1.447	0.467	0.534	3.917
	Masters	1.238	0.770	0.295	5.195
Family income	Below 20k (ref)				
	20k-30k	1.286	0.403	0.713	2.319
	30k-50k	1.852	0.052	0.993	3.451
	Above 50k	1.479	0.254	0.754	2.898
Age		1.117	0.189	0.946	1.320

(\*) for  $p < 0.05$

*Attitude:*

The LR results of the different associated risk factors for attitude toward VBD are presented in Table 7. Male students are almost 1.8 times more likely to have a favorable attitude toward VBD than female students (OR: 1.818; 95% C.I: 1.073, 3.079). Students from the Mymensingh division are 0.06 times less likely to have a favorable attitude toward VBD than students from the Barisal division (OR: 0.068; 95% C.I:0.001, 0.876). Students who spend 1-2 hours on social media are almost three times more likely to have favorable output toward VBD than students who spend less than one hour on social media (OR: 3.058; 95% C.I:1.241, 7.535).

*Practice:*

The factors of blood donation practice are presented in Table 8. Male students are almost five times (OR: 5.375; 95% C.I:3.115, 9.273) more likely to be donors than female students. Students living at home are 0.397 times (OR: 0.0397; 95% C.I:0.181, 0.869) less likely to be donors than students in the hall. Every 1-year increase in age increases the chance of being a donor by 1.2 times.

Table 7. List of covariates adjusted attitude toward VBD

Variable	Category	OR	P-value	95% CI	
				Lower	Upper
Gender	Female (ref)				
	Male	1.818	0.026*	1.073	3.079
Division	Barisal (ref)				
	Chittagong	2.888	0.377	0.275	30.320
	Dhaka	0.762	0.676	0.214	2.708
	Khulna	1.296	0.669	0.394	4.260
	Mymensingh	0.068	0.039*	0.001	0.876
	Rajshahi	0.639	0.522	0.162	2.516
	Rangpur	1.980	0.423	0.372	10.522
Social media time	Sylhet	1			
	Less than 1 hour (ref)				
	1-2 hours	3.058	0.015*	1.241	7.535
	2-3 hours	1.436	0.388	0.631	3.264
	Above 3 hours	1.231	0.614	0.547	2.768

(\*) for  $p < 0.05$

Table 8. List of covariates adjusted for the practice of VBD

Variable	Category	OR	p-value	95%CI	
				Lower	Upper
Gender	Female (ref)				
	Male	5.375	0.000***	3.115	9.273
Current residence	Hall (ref)				
	Home	0.397	0.021*	0.181	0.869
	Rent House	0.557	0.061	0.302	1.027
Education	1st year (ref)				
	2nd Year	1.440	0.204	0.819	2.529
	3rd Year	0.559	0.221	0.220	1.417
	4th Year	0.590	0.396	0.175	1.992
	Masters	1.332	0.739	0.245	7.231
Marriage	Married (ref)				
	Divorced	1			
	Unmarried	0.385	0.272	0.070176	2.115
	Widowed	0.643	0.839	0.00915	45.19
Personal income	No (ref)				
	Yes	1.223	0.493	0.687376	2.176
Smoking	Non-smoker (ref)				
	Occasionally Smoker	1.889	0.171	0.760579	4.692
	Smoker	1.391	0.405	0.639132	3.028
Age		1.210	0.049*	1.000965	1.463

(\*\*\*) indicates  $p < 0.001$ , (\*) for  $p < 0.05$

## Discussion

In this study, we tried to see the knowledge, attitude, and practice of VBD among the people of Khulna University. The binary logistic model, a multivariate model for the binary response of the dependent variable, determined the behavior of the Khulna University student on blood donation by the settings of KAP model exposure. According to our study, KAP on blood donation is associated with age, gender, permanent address, educational status, division, and time spent on social media. This study found that education was substantially and positively linked with blood donation knowledge, corroborating a study done in Sikkim, India (Shenga et al.,2019) and (Jemberu et al., 2016). This might be because education might put us better positioned to explore the world and social media more consciously. Higher education might widen our gaze, and gathering knowledge becomes more effortless.

According to our study, students from the urban area are more knowledgeable in VBD. Similar results were found by (Gebresilase et al., 2017). People from urban areas are more connected to social media, which lets them know about VBD. Again, blood donation is rare in rural Bangladesh areas, so it is hard to gather knowledge about VBD in rural areas. This study found that male students have a more positive attitude towards VBD. A similar study was found by (Limaye et al., 2018). This may have occurred because women are not that much practicing blood donation. On the other hand, Male are more active in blood donation. Our study found that division and time spent on social media are significantly associated with attitude. That may be because exploring more social media can help us improve our knowledge about blood donation. Further, the importance of blood donation can also be known from social media. In our study, age is significantly associated with blood donation practice. This is similar to findings from Ethiopia (Jemberu et al., 2016). In a developing country, age is a factor that could influence blood donation (Diongue et al., 2021). Young people are crucial in the voluntary, non-remunerated blood donation process. This could be because youth and physically healthy students are the potential sources of blood donation.

According to this research, the current residence is significantly associated with blood donation practice. The study shows that students living at home are fewer active donors than students living in the hall. This could be because students living in the hall are more active in any blood donation campaign. It is easy for them to go anywhere at any moment compared to the students who live in their homes with family. Students living at home might have to obey some family restrictions. This study shows that men donated blood more than women. This tendency toward masculinization of blood donation is not new. (Shahshahani et al.,2004) found parallel results, with women in Yazd donating blood fewer than men (Mousavi et al.,2011) in a fitted model. Women are unable to donate blood owing to their physiological makeup and the fact that they are pregnant. Many women also stop giving after they become pregnant and never return. Challenges with anemia, more acute physical reactions to blood donation, problems with minimum weight limitations, end of pregnancy, and nursing are the primary reasons listed for women's relative absence from blood donation practice. Also, the place of donation and safety for women is now a big issue for not donating blood.

## Conclusion

Shortage in the supply of safe blood is a global problem nowadays. The foundation of a safe, sustainable blood supply is the voluntary non-remunerated blood donors. Our study aimed to identify the knowledge, attitude, and practice of VBD among Khulna University students concerning different demographic attributes. According to this study, age, gender, division, current and permanent residence, and social media time are significantly associated with KAP. Moreover, we have to target those who are not knowledgeable or have an unfavorable attitude toward VBD so that we can increase their knowledge about VBD and inspire them to practice VBD. For this, we can

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proceed through the attributes which were found significantly associated with KAP toward VBD in this study conducted for the students of Khulna University.

## References

- Ahmed, Z., Zafar, M., Khan, A. A., Anjum, M. U., & Siddiqui, M. A. (2014). Knowledge, attitude, and practices about blood donation among undergraduate medical students in Karachi. *Journal of Infectious Diseases and Therapy*.
- Baig, M., Habib, H., Haji, A. H., Alsharief, F. T., Noor, A. M., & Makki, R. G. (2013). Knowledge, misconceptions and motivations towards blood donation among university students in KSA. *Pakistan journal of medical sciences*, 29(6), 1295.
- Chi-squared test - Wikipedia. (n.d.). Retrieved January 27, 2022, from [https://en.wikipedia.org/wiki/Chi-squared\\_test#Pearson's\\_chi-squared\\_test](https://en.wikipedia.org/wiki/Chi-squared_test#Pearson's_chi-squared_test)
- Choudhury, N. (2011). Blood transfusion in borderless South Asia. *Asian Journal of Transfusion Science*, 5(2), 117. <https://doi.org/10.4103/0973-6247.83234>
- Damesyn, M. A., Glynn, S. A., Schreiber, G. B., Ownby, H. E., Bethel, J., Fridey, J., ... & Busch, M. P. (2003). Behavioral and infectious disease risks in young blood donors: implications for recruitment. *Transfusion*, 43(11), 1596-1603.
- Diongue, F. B., Bassoum, O., Tine, J. A. D., Sall, A., Niang, K., Leye, M. M. M., Diallo, A. I., Faye, A., Diongue, F. B., Bassoum, O., Tine, J. A. D., Sall, A., Niang, K., Leye, M. M. M., Diallo, A. I., & Faye, A. (2021). Knowledge Attitudes, Practices and Factors Associated with Blood Donation in the Fatik Health District in 2019 (Senegal). *Open Journal of Preventive Medicine*, 11(4), 132–146. <https://doi.org/10.4236/OJPM.2021.114011>
- Elias, E., Mauka, W., Philemon, R. N., Damian, D. J., Mahande, M. J., & Msuya, S. E. (2016). Knowledge, Attitudes, Practices, and Factors Associated with Voluntary Blood Donation among University Students in Kilimanjaro, Tanzania. *Journal of Blood Transfusion*, 2016, 1–8. <https://doi.org/10.1155/2016/8546803>
- Gebresilase, H. W., Fite, R. O., & Abeya, S. G. (2017). Students' knowledge, attitude and practice towards blood donation in Arsi University and Adama science and technology university: A comparative cross-sectional study. *BMC Hematology*, 17(1), 1–10. <https://doi.org/10.1186/S12878-017-0092-X/TABLES/10>
- Jemberu, Y. A., Esmael, A., & Ahmed, K. Y. (2016). Knowledge, attitude and practice towards blood donation and associated factors among adults in Debre Markos town, Northwest Ethiopia. *BMC Hematology*, 16(1), 1–8. <https://doi.org/10.1186/s12878-016-0062-8>
- Limaye, D., Naik, P., Varekar, T., Salunkhe, P., Shah, C., Sydymanov, A., Limaye, V., Pitani, R. S., Sathe, S., Kapadi, A., & Fortwengel, G. (2018). Knowledge and attitude towards voluntary blood donation among students from Mumbai University. *International Journal of Scientific Reports*, 2018(4(6)), 142–146. <https://doi.org/10.25968/OPUS-1341>
- Lownik, E., Riley, E., Konstenius, T., Riley, W., & McCullough, J. (2012). Knowledge, attitudes and practices surveys of blood donation in developing countries. *Vox Sanguinis*, 103(1), 64–74. <https://doi.org/10.1111/J.1423-0410.2012.01600.X>
- Manikandan.S, Srikumar R, Ruvanthika PN. A study on KAP on blood donation Among health profession student in Chennai, Tamil's ado, south India. *International of scientific and research publication*. 2013;3(3):2-4.

- Mousavi, F., Tavabi, A. A., Golestan, B., Ammar-Saedi, E., Kashani, H., Tabatabaei, R., & Iran-Pour, E. (2011). Knowledge, attitude and practice towards blood donation in Iranian population. *Transfusion Medicine*, 21(5), 308–317. <https://doi.org/10.1111/j.1365-3148.2011.01080.x>
- National AIDS Control Organisation. (2007, July). Voluntary blood donation - national AIDS control organisation.naco.gov.in.<http://naco.gov.in/sites/default/files/voluntary%20blood%20donation.pdf>
- Pituch, K. A., & Stevens, J. P. (2020). Binary Logistic Regression. *Applied Multivariate Statistics for the Social Sciences*, 454–490. <https://doi.org/10.4324/9781315814919-16>
- Salaudeen, A. G., and E. Odeh. "Knowledge and behavior towards voluntary blood donation among students of a tertiary institution in Nigeria." *Nigerian journal of clinical practice* 14.3 (2011): 303-307.
- Shenga N, Thankappan K, Kartha C, Pal R. Analyzing socio demographic factors amongst blood donors. *J Emerg Trauma Shock*. 2010;3(1):21–5
- Situation Assessment of Public and Private Blood Centres in Bangladesh. (n.d).
- Soumerai, S. B., Salem-Schatz, S., Avorn, J., Casteris, C. S., Ross-Degnan, D., & Popovsky, M. A. (1993). A controlled trial of educational outreach to improve blood transfusion practice. *Jama*, 270(8), 961-966.
- Suen, L. K. P., Siu, J. Y. M., Lee, Y. M., & Chan, E. A. (2020). Knowledge level and motivation of Hong Kong young adults towards blood donation: a cross-sectional survey. *BMJ Open*, 10(1), e031865. <https://doi.org/10.1136/BMJOPEN-2019-031865>
- Ugwu, N., Oti, W. O., Ugwu, C., & Uneke, C. (2019). Voluntary non-remunerated blood donation: Awareness, perception, and attitude among potential blood donors in Abakaliki, Nigeria. *Nigerian Journal of Clinical Practice*, 22(11), 1509–1509.
- Uma, S., Arun, R., & Arumugam, P. (2013). The Knowledge, Attitude and Practice Towards Blood Donation Among Voluntary Blood Donors in Chennai, India. *Journal of Clinical and Diagnostic Research : JCDR*, 7(6), 1043. <https://doi.org/10.7860/JCDR/2013/4851.3033>
- Urgesa, K., Hassen, N., & Seyoum, A. (2017). Knowledge, attitude, and practice regarding voluntary blood donation among adult residents of harar town, eastern ethiopia: A community-based study. *Journal of Blood Medicine*, 8, 13–20. <https://doi.org/10.2147/JBMS121460>
- Waheed, U., & Abbas Zaheer, H. (n.d.). Knowledge, Attitude and Practices towards Blood Donation in Pakistan: A Nationwide Survey. 1. <https://doi.org/10.15406/htj.2015.01.00018>
- Woolson, R. F., Bean, J. A., & Rojas, P. B. (1986). Sample size for case-control studies using Cochran's statistic. *Biometrics*, 927-932.
- Zmijewski, C. M., & Haesler, W. E. (1982). *Textbook of Bloodbanking Science*. Appleton-Century-Crofts.