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ORIGINAL ARTICLE

Knowledge, attitude and practice towards voluntary blood donation among students from Quest International University, Malaysia

Nurliyana Farzana Binti Ayob[1]*, Adisha[2], Godagama Kankanamge Nilusha[3], Binath Abdul Moieed Ahsan Siddiqui[4], Harresh A/L Baskaran[5], Mathivanan Abavanan[6], Varadhan Santhosh[7], Maddu Makhish[8], Mohamed Arzath Uzair[9], Samuel Gnanamuttu[10]

Corresponding author:

[1]Nurliyana Farzana Binti Ayob, MBBS third year student, Email: nurliyanafarzana@gmail.com [ORCID]

[2]Adisha [ORCID]
[3]Godagama Kankanamge Nilusha [ORCID]
[4]Binath Abdul Moieed Ahsan Siddiqui [ORCID]
[5]Harresh A/L Baskaran [ORCID]
[6]Mathivanan Abavanan [ORCID]
[7]Varadhan Santhosh [ORCID]
[8]Maddu Makhish [ORCID]
[9]Mohamed Arzath Uzair [ORCID]
[10]Samuel Gnanamuttu [ORCID]

[1-10]third year MBBS student

All authors are affiliated to
Faculty of Medicine, Quest International University (QIU), No. 227, Plaza Teh Teng Seng (Level 2), Jalan Raja Permaisuri Bainun, 30250 Ipoh, Perak Darul Ridzuan, Malaysia

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ABSTRACT

Introduction:
Blood donation is an integral part of the healthcare system, and it increases the chances of life expectancy. Blood is essential during an accidental emergency, pregnancy, anaemia, and other disorders. Doubtless, blood and blood components demand increased in recent years, but finding regular donors remains a challenge. Adequate knowledge may help to motivate people to donate blood. This research aimed to assess undergraduate students' knowledge, attitude, and practice (KAP) of blood donation.

Methods:
An online cross-sectional survey was conducted among 279 undergraduates (male 111, female 168) in Quest International University (QIU). The online questionnaires were distributed via Google forms to collect data on sociodemographic variables, knowledge, attitude, and practices pertaining to blood donation. Chi-square or Fisher's exact test was used for testing the significance between proportions.

Results:
Female students were significantly more aware of blood donation than males. The attitudes of female respondents were significantly more favourable than their counterparts. significantly more female respondents donated blood than males.

Conclusion:
Most participants had good knowledge and positive sentiments toward blood donation, but the practice still needs to be improved. So, there is a need for an active education program to encourage all students to donate blood.

Keywords
Blood donation, gender, health, students, university.

Introduction

Blood is a liquid connective tissue and an essential human body component. Blood transfusion increases the chances of life expectancy and is lifesaving in an accidental emergency, pregnancy, anaemia, and other diseases. There is also an increasing demand for blood and blood components, which is closely associated with improving healthcare delivery. [1, 2] As per the World Health Organization (WHO) recommendations to fulfil the demand for blood, a minimum of 3-5% population should donate blood every year. [3] Blood scarcity is a general problem in hospitals due to the disparity between the demand and supply of blood products. Getting voluntary blood donors is always challenging for developing and developed countries. [4] In some countries, a replacement donation is an option for healthcare institutions. [5] There is sustained effort worldwide to encourage the voluntary blood donation practice. Voluntary unpaid donors are considered the most suitable group who donate blood regularly. [4, 6]

Finding regular donors is a great challenge for developing and developed countries. An estimated 60% of developing countries' population has sufficient knowledge regarding blood donation. Considering the blood donation rate, low-income, middle-income, and high-income countries are 3.9, 36.8, and 11.7 per 1000 population, respectively. Plenty of factors are involved in the lower blood donation rate, including misconceptions, potential hazards, and a lack of inspirational drive among blood donors. [3, 7] According to the available statistics from the developing countries, a majority (60%) comes from paid blood donation and the remaining from the community. [8] Youths below 25 contribute 38% of the voluntarily donated blood. [9] Hesitation, fear of complications, and associated risks are the primary drive for the reluctance of blood donation. [10] So, strong motivation and encouragement to a young generation could reduce the occurrence of paid blood donation worldwide. Furthermore, they can encourage others in society toward voluntary blood donation and reduce the chasm between demand and supply of blood. [11] As fewer studies are available in this area, this research aims to assess the knowledge, attitude, and practice (KAP) of blood donation among undergraduate students.

Methods

Study period, study design, and participants

This cross-sectional descriptive study was conducted at the Quest International University (QIU) from April 2021 to July 2021. This study assesses the knowledge and attitude towards voluntary blood donation, and a reliable Google form questionnaire was used.

Inclusion and exclusion criteria

All students at Quest International University from foundation, diploma, degree and postgraduate courses willing to participate were included in this research. Informed consent was also obtained. Students who were unwilling to participate did not provide informed consent and did not satisfy the inclusion criteria for this research were excluded.

Sample size calculation

The selection of study participants is voluntary and a non-representative sampling method (convenient sampling) will be used for this research. Using an online tool (openepi) accessible on openepi.com and assuming the number of students at Quest University as 1000, sample size was determined with the assumption that approximately 50% of respondents will be having a good level of knowledge. The sample size was calculated as 278 for a confidence interval of 95 percent and an absolute precision of 5%.

Collection of data and criteria for scoring

A validated structured questionnaire was used for data collection, namely sociodemographic variables, knowledge, attitude, and practices pertaining to blood donation.

The first section of the questionnaire evaluated the knowledge level of the participants. For knowledge, a scoring mechanism is used, which incorporated 28 questions. Thus, the maximum score that one participant could score in this segment was 28, and the minimum score was 0 since one mark was awarded for each correct answer and a 0 for wrong or non-attempt. Adequate knowledge was classified as having a score of more than and equal to the "mean value" ($\geq$ x).

The second section assesses the respondent's attitude regarding blood donation and consists of 19 statements. Out of 7 positive statements, scored 3 [agree], 2 [neutral], 1 [disagree] and 12 negative statements scored 1 [agree], 2 [neutral], 3 [disagree]. Mean score will be calculated, those who scored more than and equal to "mean value" ($\geq$ x).were assumed to have positive attitude in comparison to the rest.

Data management and statistical analysis

Statistical analysis was carried out using Statistical Package for Social Sciences (SPSS v26). The continuous variables (age, knowledge scores and attitude score) will be presented as mean ± standard deviation (SD), median, and interquartile range. The categorical variables were described as frequencies and proportions. Chi-square or Fisher's exact test was used for testing the significance between proportions, as applicable. All statistical tests were conducted on a two-sided basis with the significance level at p value < 0.05.

Ethical committee approval

Participation in this study was completely voluntary. Students gave consent before taking part in the survey. Confidentiality and anonymity are ethical principles that were designed in this study to protect the privacy of participants when collecting, analysing, and reporting data.

The study was approved by Quest International University's Research Ethics Committee.

Results

Table 1 Socio-demographic variables of respondents (N = 279)

Socio-demographic Variable	n	(%)	Mean	(SD)
Age (years)			21.29	(2.7)
< 21	121	(43.4)		
≥ 21	158	(56.6)		
Gender				
Male	111	(39.8)		
Female	168	(60.2)		
Religion				
Islam	62	(22.2)		
Hinduism	85	(30.5)		
Buddhism	70	(25.1)		
Christianity	43	(15.4)		
Other	19	(6.8)		

The study was conducted on 279 participants from students at Quest International University. Average age of the respondents was 21.29 with standard deviation of 2.7 (M = 21.29, SD = 2.7). There were more female participants, 168 (60.2%), compared to their counterparts, 111 (39.8%). The majority of the participant practiced Hinduism (30.5%) in this study, followed by Buddhism (25.1%), Muslimism (22.2%), and Christianity (15.4%). Only 6.8 percent of the respondents practiced other religions in this study (Table 1).

There was a significant association between the level of knowledge and gender [X^2 (1) = 7.02, p = 0.008] was found. The result indicates that female students were more aware of blood donation than males. As for the attitudes towards blood donation, a significant association was observed between age categories [X^2 (1) = 0.01, p = 0.914]. The result mirrors the knowledge of blood donation. The attitudes of female respondents were significantly more favourable than their counterparts (Table 2).

Table 2: Relationship between sociodemographic variables and general knowledge, and attitude towards blood donation

	Inadequate knowledge		Adequate knowledge				
Socio-demographic Variable	n	(%)	n	(%)	Chi	(df)	p value
Age (years)							
Less than 21	49	(40.5)	72	(59.5)	0.01	(1)	0.914×
Equal and more than 21	65	(41.1)	93	(58.9)			
Gender							
Male	56	(50.5)	55	(49.5)	7.02	(1)	0.008*
Female	58	(34.5)	110	(65.5)			
Religion							
Islam	22	(35.5)	40	(64.5)	5.00		0.288×
Hinduism	29	(34.1)	56	(65.9)			
Buddhism	34	(48.6)	36	(51.4)			
Christianity	20	(46.5)	23	(53.5)			
Other	9	(47.4)	10	(52.6)			
Relationship between sociodemographic variable and attitude on blood donation							
	Negative Attitude		Positive Attitude				
Socio-demographic Variable	n	(%)	n	(%)	Chi	(df)	p value
Age (years)							
< 21	20	(16.5)	101	(91.8)	4.53	(1)	0.033*
≥ 21	13	(8.2)	145	(88.2)			
Gender							
Male	17	(15.3)	94	(84.7)	2.15	(1)	0.143×
Female	16	(9.5)	152	(90.5)			
Religion							
Islam	5	(8.1)	57	(91.9)	6.73		0.136×
Hinduism	6	(7.1)	79	(92.9)			
Buddhism	10	(14.3)	60	(85.7)			
Christianity	8	(18.6)	35	(81.4)			
Other	4	(21.1)	15	(78.9)			

*p<0.05, ×p>0.05

Table 3: Relationship between sociodemographic variable and practice on blood donation (Item P1)

P1	Have you ever donated blood						
	No		Yes				
Socio-demographic Variable	n	(%)	n	(%)	Chi	(df)	p value
Age (years)							
< 21	102	(84.3)	19	(15.7)	10.02	(1)	0.002
≥ 21	107	(67.7)	51	(32.3)			
Gender							
Male	66	(84.3)	45	(40.5)	23.42	(1)	< 0.001
Female	143	(67.7)	25	(14.9)			
Religion							
Islam	45	(72.6)	17	(27.4)	1.26		0.878
Hinduism	65	(76.5)	20	(23.5)			
Buddhism	54	(77.1)	16	(22.9)			
Christianity	30	(69.8)	13	(30.2)			
Other	15	(78.9)	4	(21.1)			

Sociodemographic variable * Practice on blood donation (Item P2)

P2	If yes, how many times								
	Never		Once		More than once				
Socio-demographic Variable	n	(%)	n	(%)	n	(%)	Chi	(df)	p value
Age (years)									
< 21	102	(84.3)	14	(11.6)	5	(4.1)	22.03	(2)	<0.001*
≥ 21	107	(67.7)	12	(7.6)	39	(24.7)			
Gender									
Male	66	(59.5)	7	(17.1)	18	(23.4)	24.75	(2)	<0.001*
Female	143	(85.1)	26	(4.2)	44	(10.7)			
Religion									
Islam	45	(72.6)	9	(14.5)	8	(12.9)	5.81		0.666×
Hinduism	65	(76.5)	7	(8.2)	13	(15.3)			
Buddism	54	(77.1)	3	(4.3)	13	(18.6)			
Christianity	30	(69.8)	5	(11.6)	8	(18.6)			
Other	15	(78.9)	2	(10.5)	2	(10.5)			

P4	Have you encouraged anyone to donate blood						
	No		Yes				
Socio-demographic Variable	n	(%)	n	(%)	Chi	(df)	p value
Age (years)							
< 21	38	(31.4)	83	(68.6)	3.50	(1)	0.061×
≥ 21	34	(21.5)	124	(78.5)			
Gender							
Male	33	(29.7)	78	(70.3)	1.48	(1)	0.223×
Female	39	(23.2)	129	(76.8)			
Religion							
Islam	13	(21.0)	49	(79.0)	14.02		0.007*
Hinduism	12	(14.1)	73	(85.9)			
Buddism	25	(35.7)	45	(64.3)			
Christianity	16	(37.2)	27	(62.8)			
Other	6	(31.6)	13	(68.4)			

*p<0.05, ×p>0.05

Table 3 demonstrates the association between sociodemographic variables and blood donation practice. There were significantly more female respondents who donated blood than males [X^2 (1) = 23.42, p = 0.002.]. The result also reflects the frequency of blood donation in the past by female respondents [X^2 (1) = 24.75, p <0.001]. Also, the proportion of younger respondents (<21 years) donating blood is significantly lower compared to those more than 21 years [X^2 (1) = 10.02, p = 0.002]. A significant association is observed between religion and encouragement of blood donation (p =0.007).

A Pearson correlation coefficient was computed to assess the relationship between individual knowledge and attitude scores. There was a significant moderately weak positive correlation between the two variables [r = 0.25, p < 0.001]. An increase in individual knowledge score increases individual attitude score.

Discussion

Students' general knowledge on blood donation

We found females had more knowledge than males, but this contradicts the research done at King Abdulaziz Medical City (KAMC) university in Saudi Arabia, where females had less knowledge regarding blood donation than males. [12] This may be because they seem to be more altruistic in this sense and retain stronger moral norms and positive attitudes towards voluntary blood donation.

Regarding the general knowledge questions, 93.9% of QIU female students answered correctly about the universal blood donor type compared to other study participants in Kilimanjaro, Tanzania (85.3%) and Tamil Nadu, India (69.8%). [13, 14] We found that most of the QIU students answered the correct minimum age required and the minimum weight threshold needed to donate blood, whereas a study by Alfouzan et al. showed a much lesser number in both cases. [12] Furthermore, 62% of participants answered the minimum time interval required between blood donations compared to another study (43.6%). The participants of QIU had good knowledge about the volume of blood collected from an individual compared to another study [13]. Question on the minimum Hb level required to donate blood was answered correctly by half of the present study respondents. In contrast, Govindasamy V et al. from the state of Tamil Nadu, India, found only one-third of the students responded correctly. [14] We found that students studying in QIU have shown a good knowledge of blood donation, but still, there is room for improvement.

Students' attitude towards blood donation

A significant proportion of QIU students (81.2%) considered blood donation a safe process. A similar study in a Nigerian university supported our findings, where most of the students had shown their willingness to donate blood. Only fewer were afraid due to fear of needles, fear of being infected and fear of faint attacks. [15] Another research showed that half of its participants pointed out that fear of pain was the main reason for the hesitation of blood donation, and 12.5% of participants had various other reasons to avoid blood donation. [14] Religious beliefs play an essential role in blood donation. Some believe it is a sacred duty to save a life. We found that most participants (90.3%) believe blood donation is not against their religious beliefs. In an Ethiopian study, authors reported that participants who come under catholic and Jewish don't show interest in blood donation because of their spiritual issues. [16] Similar findings are also documented in an Indian study. [14] This may be because students are from many different countries and religions, making them more open-minded, rational and practical.

Students' practice related to blood donation

Gender plays a vital role in the motivation to give blood. For blood donation, women are more altruistic, and men are more individualistic. [17] We found that females have a higher tendency to donate blood than females, which is dissimilar to another study by Mahfouz et al. on university students in Saudi Arabia. [18] Not getting the opportunity to donate may be one of the reasons for a lesser donation rate. Iranian research documented a significant percentage of women had false beliefs about blood donation, along with other factors such as anaemia, fear, lack of time and difficulty in access to donation sites, etc. [19] Some donor deferral criteria were found to apply to young females often more frequently than to males, accounting for the majority of the difference in deferral rates between young female and male potential donors. We found one-fourth of our participants have donated blood in their life, and 15.8% among them donated more than once. Similar data has been recorded in research done by undergraduate health science students at the University of Gondar, Northwest Ethiopia, where only 12.5% had donated blood more than once. [20] The cross-sectional study conducted by Govindasamy V et al. among the medical students in Tamil Nadu contradicts this with a higher data of 45.6% of students donating blood at least once, and 54.4% donated more frequently. Just 9.3% of respondents in our research have donated blood once in their life. Comparatively higher data had been found in research conducted among adult residents of Harare town, Eastern Ethiopia, in which 22.6% had donated blood at least once.

According to the findings of this research, 74. 9% have never donated blood events at once. But this proportion of blood donation is high compared to the results from university students in Nepal (43%) and the USA (56%), respectively. 26.2% of QIU students have claimed that they never had an opportunity to donate. Melku M et al. reported in the research done at the Gondar University that 53. 3% of the corresponding respondents have never been approached to donate. [16]

Being unfit was the least common cause of non-donation among QIU students. In contrast, this was one of the main averting factors for other researchers. Certain factors like age, weight, health, etc., can disqualify people who may be willing to donate. Those below 18 years and above 65 years, those who are under 45kg, people who are suffering from severe health conditions, pregnant or breastfeeding women, and those who may be involved in high-risk occupations are ineligible to donate, taking the donor's and the recipient's health into consideration. These factors are required to prevent adverse effects on both parties. Pre-donation screenings are done to detect if the donor suffers from any transmissible infections. This can decrease the fraud acts of commercial donors who may hide their high-risk behaviour and risk the recipient's life. As being underage is one of the deferrals, 84.3% of QIU respondents below 21 years have not donated blood. [18]

Govindasamy et al. found that 7.4% were underweight, similar to the QIU students of 10%. 7.5 % of QIU respondents are anaemic and this is not supported by the study among medical students in Tamil Nadu, where 36%

suffered from anemia. Religion has no significance in blood donation. [14] This is contrary to the Naranja et al. study, where it has a significant relation to the donation status in low-middle-income countries. [21] The majority of the QIU respondents, both who have donated and not donated before, accounted for 74.2%, have encouraged others and are willing to donate in future. Whereas Anand et al. found that 50% of the study targets in an urban Community, Chennai, have encouraged others. [22]

Conclusion

We conclude that more than half of the respondents have adequate blood donation knowledge. NGOs, health care providers, and the government must run education campaigns stating the significance of blood donation. Females have more knowledge and a positive attitude toward blood donation and donate blood more than males, which depicts the importance of guiding the males to voluntary blood donations. Adequate knowledge on the topic can reduce misconceptions and motivate more people to donate blood.

Limitation and future scope

We acknowledge that our research has several limitations. Our study is an online cross-sectional study, a longitudinal analysis would help in this regard. In addition, our sample size was small; future studies are recommended by involving students from other universities in the Perak state.

Abbreviations

King Abdulaziz Medical City (KAMC), Quest International University (QIU), World Health Organization (WHO)

Relevance of the study

The present study is significant because blood donation is an essential integral part of the healthcare system, and a solid motivation to donate blood can solve lots of problems related to the scarcity of blood and the components of blood.

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Authors' contribution

All authors contributed equally to study planning, data collection, data analysis/ interpretation, manuscript writing, manuscript revision, All atuthors finally approved the manuscript. Agreement to be accountable for all aspects of the work was also accepted by all authors.

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Availability of data and materials

All data underlying the results is available as part of the article, and no additional source data is required.

Competing interests

None declared.

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References

1. Mohammed H, Osman T. Voluntary Blood Donation among Medical Students in a Resource-limited Country. JPHDC. 2016;2(3):257-67.
2. World Health Organization. Voluntary unpaid blood donations must increase rapidly to meet 2020 goal. [cited 2022 July 11] Available from: http://www.who.int/campaigns/world-blood-donor-day/2016/event/en/.
3. Blood Safety and Availability [Internet]. WHO Fact Sheet. 2013(279). [cited 2022 July 11] Available from: http://www.who.int/mediacentre/factsheets/fs279/en/.
4. Karim MR, Alam M, Farazi MMR, Labone RJ. Factors influencing blood donation behavior of university level student in Bangladesh. JIT 2012;1:35-40.
5. Blood safety and availability. World Health Organization (WHO). [cited 2022 July 11] Available from: https://www.who.int/news-room/fact-sheets/detail/blood-safety-and-availability.
6. Tapko JB, Toure B, Sambo LG. Status of blood safety in the WHO African region: report of the 2010 survey. Brazzaville: WHO Regional Office for Africa; 2014.
7. Riley W, Schwei M, McCullough J. The United States potential blood donor pool: estimating the prevalence of donor-exclusion factors on the pool of potential donors. Transfusion. 2007;47(7):1180-8. https://doi.org/10.1111/j.1537-2995.2007.01252.x
8. Mitra K, Mandal PK, Nandy S, Roy R, Joaardar GKA. Study on awareness and perceptions

regarding blood safety and blood donation among health care providers in a teaching hospital of Calcutta. Indian J Community Med. 2001;26(1):21-5.
9. Van Hulst M, SmitSibinga CT, Postma MJ. Health economics of blood transfusion safety-focus on sub-Saharan Africa. Biologicals. 2010;38(1):53-8. https://doi.org/10.1016/j.biologicals.2009.10.006
10. Zubair H, Seema HS. Comparative Study on Knowledge Attitude and Practice regarding Blood Donation in Rural and Urban area of Bangalore. Int J Med Health Sci. 2015;4(3):309-14.
11. Anwer MO, Fawwad SH, Anwer S, Ali A: Attitude toward blood donation among medical and nonmedical students across Karachi. Asian J Transfus Sci. 2016, 10:113-117. https://doi.org/10.4103/0973-6247.187937
12. Alfouzan N. Knowledge, attitudes, and motivations towards blood donation among King Abdulaziz Medical City population. Int J Family Med 2014;2014:539670. https://doi.org/10.1155/2014/539670
13. Elias E, Mauka W, Philemon RN, Damian DJ, Mahande MJ, Msuya SE. Knowledge, attitudes, practices, and factors associated with voluntary blood donation among university students in Kilimanjaro, Tanzania. J Blood Transfus 2016;2016:8546803. https://doi.org/10.1155/2016/8546803
14. Govindasamy V, Sivasankaran D, Purushothaman V. Knowledge, attitude and practice regarding blood donation among medical students of Tamil Nadu- a cross sectional study. Int J Community Med Public Health 2019;6:4583-7. https://doi.org/10.18203/2394-6040.ijcmph20194532
15. Salaudeen AG, Odeh E. Knowledge and behavior towards voluntary blood donation among students of a tertiary institution in Nigeria. Niger J Clin Pract 2011;14:303-7. https://doi.org/10.4103/1119-3077.86773
16. Melku M, Terefe B, Asrie F, Enawgaw B, Melak T, Tsegay YG, et al. Knowledge, attitude, and practice of adult population towards blood donation in Gondar town, Northwest Ethiopia: A community based cross-sectional study. J Blood Transfus 2016;2016:7949862. https://doi.org/10.1155/2016/7949862
17. Bani M, Giussani B. Gender differences in giving blood: a review of the literature. Blood Transfus 2010;8:278-87.
18. Mahfouz MS, Ryani M, Saleh Hamzi NA, Zaeri DA, Dahdoh AA, Almalki AJ, et al. Blood donation among university students: practices, motivations, and barriers in Saudi Arabia. Avicenna J Med 2021;11:70-6. https://doi.org/10.4103/ajm.ajm_113_20
19. Javadzadeh Shahshahani H. Why don't women volunteer to give blood? A study of knowledge, attitude and practice of women about blood donation, Yazd, Iran, 2005. Transfus Med 2007;17:451-4. https://doi.org/10.1111/j.1365-3148.2007.00803.x
20. Kassie A, Birara S. Practice of blood donation and associated factors among adults of Gondar city, northwest Ethiopia: Bayesian analysis approach [retraction]. J Blood Med 2021;12:85. https://doi.org/10.2147/JBM.S307048
21. Naranja AAQ, Oruga MDP, Bonito SR. Demographic Profile, knowledge, attitude, and practices of blood donors in a low-middle income country. J Keperawatan Padjadjaran 2021;9:110-7. https://doi.org/10.24198/jkp.v9i2.1658
22. Anand D, Pugazhendiinban. A study on knowledge, attitude and practice regarding blood donation in an urban community, Chennai. Public Health Rev: Int J Public Health Res 2018;5:35-44 https://doi.org/10.17511/ijphr.2018.i1.05