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Knowledge, Attitude and Practice of Blood Donation: A Single-Centred Experience in Sandakan, Sabah

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ABSTRACT

Many factors contribute to the reluctance towards blood donation, but available studies done in Malaysia involving University students does not reflect the knowledge of the public in general. The objective of this study is to determine knowledge, attitude practice towards blood donation among the Sandakan population. A cross-sectional study was employed using an adapted 29-item structured validated questionnaire available in English and Bahasa, consisting of subject's demography, questions regarding knowledge, attitude, and perception of blood donation. Convenient random sampling was done within the hospital compound, 79 healthy adults consented, and their data were used for the final data analysis, yielding an excellent internal consistency (Cronbach's α coefficient = 0.816). Out of all, 74.7% of the respondents had a high level of knowledge, and independent t-tests showed that those who were not married, had tertiary education, donated blood in the past, had a statistically significant higher level of knowledge and 96.2% of respondents have a positive attitude. Some donors (40.6%) donated blood for moral satisfaction, and only a quarter (25%) experienced adverse events. Fear of pain, needle, fainting was the highest reason for reluctance in blood donation (36.2% of non-donors), followed by self-perception of being medically unfit to donate (31.9% of non-donors). Even though the sampled population in Sandakan showed an adequate level of knowledge as well as a positive attitude towards blood donation, blood product shortage is still present. This study may contribute by serving as an educational platform for awareness and education to improve the number of blood donors.

INTRODUCTION

Blood products are always required by hospitals, whether in a rural or urban setting. From the year 2004 to 2014, the number of blood transfusions increased by 52% from 222,807 to 338,598[1, 2]. Blood products are needed continuously in hospitals, with indications such as major surgical procedures, trauma from accidents, and anaemia from various causes, especially thalassaemia[3]. According to the Malaysian Thalassaemia Registry, from 2016 to 2017, there was a 22% increase in transfusion-dependent thalassaemia patients, from 3,657 to 4,463 cases[4, 5]. Sabah state had the most number of registered patients standing at 1,272 and the prevalence continues to increase[6]. In Sabah, α- and β -thalassaemia were confirmed in 33.6% and 12.8% respectively among Kadazandusuns, which makes up 60% of the population of Sabah[7]. Furthermore, screening done at primary health clinics done in 2017 showed that out of 645 samples, up to 28% of the female sample and 41% of the male sample were tested positive for abnormal haemoglobin subtypes[8].

Based on the crossmatch lab registry in Hospital Duchess of Kent, Sandakan, from January to September 2018, an average of 202 packed cells per month was transfused into thalassaemic patients in the local daycare centre, among which 53% of the products require O-positive donors. Furthermore, the demand for blood products throughout the hospital was 8,945, but only 8,377 were supplied within the nine months, with 3,994 of it are blood group O positive, which makes up to 47.6% transfusions consist of blood products from group O donors. Unfortunately, only 45.7% (n = 3,231) of the blood donors are group O from the overall donors (n = 7,076). Hence, the constant supply of blood products are required, and can only be obtained from blood donors[9].

According to the local registry, 80.2% of the blood donors are regular donors, with the remaining 19.2% are first-time or occasional donors, for the year 2018[10]. More new donors need to be recruited and encouraged to donate blood to increase the number of regular donors to be able to meet the demand for blood products. Many factors may encourage new donors to become repeated donors such as appeals on radio, a reminder to donate during the shortage, and incentives[11]. However, many factors contribute to reluctance for blood donation, such as inadequate information to non-donors, fear of the procedure of donating blood, and lack of courage[12]. Available studies were done in Malaysia with samples taken from university students. However, it does not reflect the knowledge of working people as well as those who did not receive tertiary education[13, 14].

This article focuses on the factors causing the public to be reluctant to donate blood, as well as assess the depth of knowledge and attitude of the public for donating blood. It is essential to know the knowledge and understand the expectations of our local population so that strategies to promote blood donation during campaigns can be revised[15] and the issues causing the public to be reluctant in donating blood can be addressed to achieve the goal of retaining blood donors. The objectives of this study were to estimate the proportion of blood donors that have adequate knowledge as well as having a positive attitude towards blood donation and to review the perception of blood donation of the population of Sandakan.

MATERIALS AND METHODS

The cross-sectional study design was employed in this research at Duchess of Kent Hospital between January and March 2019. A 29-item structured pre-tested validated questionnaire adapted from Suzilawati et al.[13] was made available in English and Bahasa Melayu.

The questionnaire consisted of four parts. Part A consisted of questions regarding the subject's demography. Parts B, C, and D consist of 18-items regarding knowledge, 4-items regarding attitude, and 7-items on perception about blood donation, respectively. This study was registered in the National Medical Research Registry (NMRR) of Malaysia under NMRR-18-2926-44329. Ethical approval for this study was obtained from the Medical Research and Ethics Committee (MREC), Ministry of Health Malaysia.

Based on the study conducted by Suzilawati et al., a pilot test was done, yielding an internal consistency Cronbach's alpha of more than 0.7[13]. Using sample size calculator for Cronbach's alpha estimation by W.N. Arifin[16], with Cronbach's alpha of 0.7, and precision of 0.1, two-tailed significance level (α) of 0.05, number of items (*k*) of 29, the drop-out rate of 10%, the sample size calculated to be 86 subjects.

Stratified random sampling was done among adults who are present around several areas, including the hospital cafeteria, grocery store, waiting area for in-patients' relatives and outpatient clinics. Subjects were randomly approached, asked to read the subject information sheet and sign the consent form if they consent to participate.

Data from returned questionnaire was directly entered into SPSS version 21, data management and analysis was done using similar software. Demographic data are presented as descriptive statistics. Independent *t*-test and one-way ANOVA were used to detect any statistical association between demographic factors and knowledge score as well as attitude score, with a *p*-value of less than 0.05 considered as statistically significant.

RESULTS

Demography

Among the 86 participants consented in this study, seven subjects were removed due to incomplete answered questionnaires. Seventy-nine respondents were used for the final data analysis, and an excellent internal consistency was obtained (Cronbach's α coefficient = 0.816). The significant proportion of the participants were from the Malay ethnic (19%), self-employed (19%), and of blood group O (27.8%) (Table 1).

Table 1 Socio-demographic variables of the respondents

***N* = 79**	**Frequency (*n*)**	**Percentage (%)**
Age		
Less than 20	2	2.5
21 – 30 Years old	36	45.6
31 – 40 Years old	29	36.7
41 – 50 Years old	9	11.4
Above 50 years old	3	3.8
Monthly income (RM)		
Below 1,000	17	21.5
1,000 – 1,999	17	21.5
2,000 – 2,999	12	15.2
3,000 – 3,999	10	12.7
4,000 – 4,999	8	10.1
5,000 and above	3	3.8
Refuse to answer	12	15.2
Gender		
Male	33	41.8
Female	46	58.2
Marital status		
Single	23	29.1
Married	54	68.4
Divorced / Widowed	2	2.5
Education level		
Primary school	4	5.1
Secondary school	36	45.6
College / University	39	49.4
Occupation		
Student	10	12.7
Self-employed	15	19.0
Healthcare	7	8.9
Business	6	7.6
Education / Teaching	9	11.4
Engineering	6	7.6
Police / Army / Defence	5	6.3
Not working	11	13.9
Others[†]	10	12.7
Blood group		
A	10	12.7
B	19	24.1
AB	12	15.2
O	22	27.8
Do not know	16	20.3

[†]: Other occupations include janitor, clerk, labourer, cashier and librarian

Knowledge

Almost three-quarters of the participants have a high level of knowledge (74.68%) (Figure 1). Independent *t*-tests showed that those who donated blood in the past had a statistically significant different level of knowledge (p = 0.049) (Table 2), which suggests that subjects who have donated blood have a higher level of knowledge compared to those who have not.

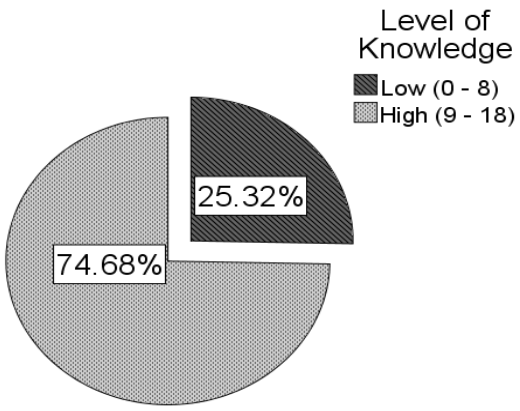

Figure 1 Level of knowledge of participants based on total score

Table 2 Independent *t*-test on demographic factors with knowledge score

Variables	Descriptive			Inferential				
	N	Mean	SD*	Mean difference	95% CI†	*t*	df	*p*-value
Gender								
Male	33	10.55	3.684	−0.281	−2.221, 1.660	−0.288	77	0.774
Female	46	10.83	4.644					
Donation history								
Yes	32	11.84	3.828	1.908	0.006, 3.809	1.997	77	**0.049**
No	47	9.94	4.381					

*: Standard deviation †: Confidence interval

Table 3 One-way ANOVA on knowledge score among participants from different marital status

	N	Mean	SD#	df † (within groups)	*F*	*p*-value	Mean difference (posthoc Tukey HSD)		
							Single	Married	Divorced / Widowed
Single	23	13.00	3.920	76	9.396	< 0.001	–	3.5 **	−4
Married	54	9.50	3.855				−3.5 **	–	−7.5 *
Divorced / Widowed	2	17.00	1.414				4	7.5 *	–
Total	79	10.71	4.246						

#: Standard deviation, †: Degree of freedom | *$p < 0.05$, ** $p < 0.01$

A one-way ANOVA (Analysis of Variance) was conducted to compare marital status to the level of knowledge among those who are single, married, and divorced or widowed. There were statistically significant differences in the level of knowledge among the three groups of participants, F (2, 76) = 9.396, $p < 0.001$ (Table 3).

Post hoc comparisons using the Tukey HSD test indicated that the mean knowledge score among married subjects (M = 9.5, SD = 3.86) were significantly different than those who were single (M = 13.0, SD = 3.92, $p = 0.001$), and those who were divorced or widowed (M = 17.0, SD = 1.41, $p = 0.023$) (Table 3). However, those who were single did not significantly differ from subjects who were divorced or widowed. These results suggest that subjects who are married had a lower level of knowledge about blood donation compared to those who are single or divorced or widowed.

Table 4 One-way ANOVA on knowledge score among participants from different education levels

	N	Mean	SD#	df † (within groups)	*F*	*p*-value	Mean difference (posthoc Tukey HSD)		
							Primary school	Secondary school	College / University
Primary school	4	5.00	3.559	76	18.852	< 0.001	–	-3.83	−8.03 ***
Secondary school	36	8.83	3.558				3.83	–	−4.19 ***
College / University	39	13.03	3.475				8.03 ***	4.19 ***	–
Total	79	10.71	4.246						

#: Standard deviation †: Degree of freedom | *$p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A one-way ANOVA was also conducted to compare education level to the level of knowledge among those who received primary, secondary or tertiary education. There were significant differences in the level of knowledge among the three groups of subjects, F (2, 76) = 18.852, $p < 0.001$. Post hoc comparisons using the Tukey HSD test shows that the mean knowledge score among subjects who received tertiary education (M = 13.0, SD = 3.48) was significantly different than those who only went primary school (M = 5.0, SD = 3.56, $p < 0.001$) or secondary school (M = 8.8, SD = 3.56, $p < 0.001$) (Table 4).

Attitude

Results from 78 respondents showed almost all (94.87%) (Figure 2) of them have a positive attitude towards blood donation. Independent *t*-tests showed no statistical significance between participants' demography and the attitude score (Table 5).

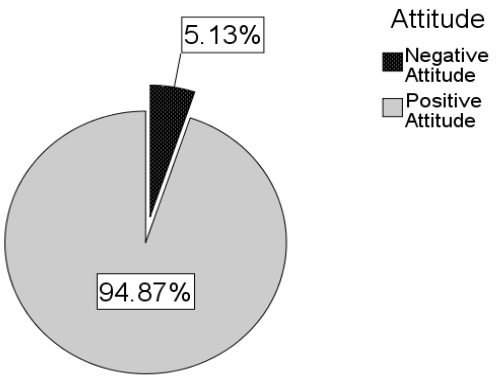

Figure 2 Attitude of participants based on score range

Table 5 Inferential statistics on demographic factors with attitude score

Variables	Descriptive			Independent *t*-test				
	N	**Mean**	**SD***	**Mean difference**	**95% CI†**	***t***	**df**	***p*-value**
Gender								
Male	33	10.88	1.193	0.079	–0.452, 0.609	0.296	76	0.768
Female	45	10.80	1.140					
Donation history								
Yes	32	11.13	1.185	0.495	–0.027, 1.016	1.890	76	0.063
No	46	10.63	1.103					
*: Standard deviation †: Confidence interval								

Most participants agreed that donating blood is voluntary and a noble act. However, only half of them (55.3%) (Table 6) intend to be regular donors.

Table 6 Item and responses on attitude towards blood donation

Items	*n*	Agree (%)	No idea (%)	Disagree (%)
Blood donation is a noble act, one should donate blood	78	92.3	7.7	0
You intend to become a regular blood donor	76	55.3	34.2	10.5
Blood should be collected only from voluntary donors	78	91.0	7.7	1.3
Blood collected during donation is sold to needy people	78	14.1	6.4	79.5

One-way ANOVA was also performed to compare marital status and education level to the attitude score of the subjects but yielded no statistical associations in between variables (Table 7).

Table 7 One-way ANOVA on demographic factors with attitude score

Variables	Descriptive			Inferential					
	N	Mean	SD*		Sum of squares	df †	Mean Square	*F*	*p*-value
Marital Status									
Single	23	10.96	1.261	Between groups	0.660	2	0.330	0.242	0.786
Married	53	10.79	1.133	Within groups	102.174	75	1.362		
Divorced / Widowed	2	10.50	0.707						
Education level									
Primary school	4	11.00	1.414	Between groups	3.459	2	1.729	1.305	0.277
Secondary school	35	10.60	1.117	Within groups	99.374	75	1.325		
College / University	39	11.03	1.158						

*: Standard deviation †: Degree of freedom

Practice

Among 79 participants, there were 32 subjects (40.5%) had history blood donation, with half of them, $n = 17$ (53.12%) were occasional donors, and only 5 (15.6%) of them were regular donors. Most donors, $n = 13$ (40.6%), donated blood for moral satisfaction, and only a quarter, $n = 8$ (25%), experienced adverse events (Table 8). Fear of pain, needle, the sight of blood, fainting was the commonest factor for discouraging blood donation (Table 9).

Table 8 Practice towards blood donation for known donors ($n = 32$)

Question		Frequency	%
How often do you donate?	Regularly at every 3 – 4 months	5	15.6
	1 or 2 times every year	7	21.9
	Occasionally	17	53.1
	Only at times of need	3	9.4
Why do you donate blood?	Moral satisfaction or humanity	13	40.6
	Blood needed for someone you know	3	9.4
	Being in a group of donors	4	12.5
	As an experience	10	31.3
	Others	2	6.3
Have you experienced any adverse effects while donating blood?	No	24	75
	Yes	8	25
If yes, what were the adverse events?	Remarkable pain	2	16.7
	Fainting	2	16.7
	Dizziness	7	58.3
	Marked weakness	1	8.3
	Total responses	12	100.0
How do you regard your experience of adverse effects?	Mild, you will ignore them	24	75
	Moderate	8	25
	Severe, you have hesitation to donate again	0	0
	Serious, you do not want to donate anymore	0	0

Table 9 Factors discouraging non-donors from donating blood (*n* = 47)

	Responses		Percentage of cases
	N	**Percentage**	
Fear of pain, needle, the sight of blood, fainting	17	19.3%	36.2%
Self-perception being medically unfit to donate	15	17.0%	31.9%
Fear of weakness as a result of blood donation	14	15.9%	29.8%
Could not manage time	12	13.6%	25.5%
Fear of other adverse effects	10	11.4%	21.3%
Do not know where, when, and how to donate	9	10.2%	19.1%
Fear of contracting the disease while donating	6	6.8%	12.8%
Nobody has requested me to donate	3	3.4%	6.4%
Parents / guardian do not allow	1	1.1%	2.1%
Others*	1	1.1%	2.1%
Total	88	100.0%	
*Others: Oversupply of subject's specific blood group at the event of donation			

DISCUSSION

Education Level on Blood Donation

The majority of the subjects (74.7%) have an adequate level of knowledge regarding blood donation, lesser than from the previous literature where a similar questionnaire was used. However, the sample population for both studies was different, whereby previous literature were students from a university, including those from nursing programme[13], in which part of their curriculum includes healthcare-related skills and knowledge that may coincide with subjects related to blood donation, as compared to the general population. Multiple studies have shown that those who received tertiary education had a higher level of knowledge on blood donation, due to better literacy level[17, 18, 19]. On the other hand, the education level of a person does not influence the attitude towards blood donation[20] since the will of an individual to donate blood is influenced by the person's behaviour, and the intention to donate depends on the individual's belief[21].

Previous History of Donation

Before blood donations, donors are required to complete a standardized donor questionnaire, to screen the suitability of the donor based on specific selection criteria[22], which may expose donors to specific knowledge and facts regarding blood donation. In Malaysia, the administered questionnaire is obtained from Appendix III of the Transfusion Practice Guidelines for Clinical and Laboratory Personnel by Ministry of Health Malaysia, and it shows that there are some similarities in terms of the content of the questions,[23] which may explain the difference in knowledge score between donors and non-donors. Lownik et al. described that those who have donated in the past were more likely to have a higher knowledge of blood donation than non-donors as donors understood the process of blood donation[24].

In this study, although generally, most subjects have a positive attitude towards blood donation, which is comparable to other developing countries[24], only 37.5% among the donors from this study regularly donate blood every year. Reasons for this occurrence is not being explored, and consequently, it is part of a limitation of this study, as factors causing new or occasional donors to be reluctant in regular donating were not part of the questionnaire. This issue serves as a possible area for future researches to understand the rationale behind donor retention.

Experiencing Adverse Events

In this study, results showed 25% of the participants experienced adverse events, which were comparable to some studies where the range of proportion of adverse events during blood donation can be as low as 0.003% up to 84%[25, 26]. Symptoms of our study subjects experienced were mainly vasovagal. It is essential to take into consideration of donor's experience during the blood donation, as such adverse events and negative experience may cause them to be less willing to donate in the future[27, 28]. Some preventable steps can be taken to prevent such adverse events from taking place to retain donors, such as pre-donation hydration[29].

The unknown time frame between blood donation and participating in the study might result in recall bias. The sample size is also not sufficient. Nevertheless, study results showed those who experienced these adverse events, graded it as moderate, and possibly might donate blood again in the future. This situation implies that non-donors can rest assure that the severity of adverse events is not severe enough to cause a person to hesitate to donate again.

Fear of Blood Donation

The results of the present study showed that fear of needle is the most common factor for non-donors to avoid blood donation, with a proportion of 36.2% of the study subjects, which is comparable to other studies done in Malaysia[30] and other countries[24]. Unusually, the second most prevalent reason for not donating is the self-perception being medically unfit, as well as other reasons such as not knowing where and when to donate, which are modifiable factors that could be prevented through raising awareness, education, and infographics. A study done in China found that self-perception of poor health was a significant barrier to blood donation, and television and the internet were to most effective ways of recruiting donors[31], which may perhaps be a way to clear misconceptions regarding blood donation as well as self-perceived health status to the public.

CONCLUSION

Even though the sampled population in Sandakan showed an adequate level of knowledge as well as a positive attitude towards blood donation, there is still a demand for blood products. This study managed to determine a few modifiable risk factors that can be quickly addressed, and information acquired from this group of participants can serve as an educational platform for awareness campaigns to improve the number of blood donors.

CONFLICT OF INTEREST

The authors declare that they have no competing interests in publishing this article.

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