

QATAR UNIVERSITY

COLLEGE OF HEALTH SCIENCES

KNOWLEDGE LEVEL, MOTIVATORS AND BARRIERS OF BLOOD DONATION

AMONG ADULTS AT QATAR UNIVERSITY; A CROSS-SECTIONAL SURVEY

BY

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A Capstone Project Submitted to

the College of Health Sciences

in Partial Fulfillment of the Requirements for the Degree of

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## ABSTRACT

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Title: Knowledge Level, Motivators and Barriers of Blood Donation Among Adults at Qatar University; A Cross-Sectional Survey

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INTRODUCTION: One out of every ten patients admitted to the hospital are in urgent need of blood transfusion or blood products in Qatar. This study aims are (1) Assess the level of knowledge towards blood donation and (2) Identify factors that contribute to the willingness to donate blood among young adults at Qatar University.

METHODS: A cross-sectional study using constructed questionnaire was conducted among students at Qatar University. Chi-square test and T-test has been used to study the association of blood donation status with different factors.

RESULTS: A total of 590 responses were collected, out of which 423 were suitable for analysis. Only 72 out of 472 participants (15%) of participants were blood donors. Gender and age was found to be significantly associated with blood donation status, with higher frequency of donation among males and young adults above the age of 24 years old. The total knowledge score has not been found to be significantly associated with blood donation status with a mean score of 60.5% for both groups (blood donors, non-blood donors). The most common motivators that encouraged blood donors to donate blood are donating to help people, followed by having a blood mobile unit come to your place. Whereas, the most common barriers reported by non-blood donors are failing to meet the requirements, followed by no one ever asked me to give blood.

CONCLUSION: Our study provides insights and guidelines that would help in developing effective strategies for recruitment and retention of young adult blood donors. Raising the awareness about blood donation, along with providing more mobile

blood donation units at public places and developing a mobile application for blood donation will aid in increasing the frequency of blood donation among young adults.

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## CHAPTER ONE: INTRODUCTION

### *1.1 Research background*

According to Hamad Medical Corporation [HMC] at Qatar, one out of every ten patients admitted to the hospital are in urgent need of blood transfusion or blood products (Hamad Medical Corporation, 2015). Blood is an essential component needed in healthcare facilities to save lives in many conditions such as traumas, surgeries, blood disorders, transplantations, pregnancy complications, or any other diseases. Blood has no alternative source other than humans, which is provided mainly from involuntary blood donors (replacement for relatives or friends) and voluntary blood donors. The blood donation process is defined as a medical procedure that involves transferring blood from a healthy, voluntary person to someone who is in need of this blood. There are many types of blood donation, which are whole blood donation, platelet donation, plasma donation, red blood cells donation. Each unit of blood donated (450 ml) can benefit at least three lives of people as separate components. Therefore, efforts continue worldwide to maintain satisfactory number of blood donors to guarantee an sufficient, safe and timely blood supply to meet the clinical demand (Ou-Yang, Bei, He, & Rong, 2017).

The Blood Donor Center at Hamad Medical Corporation is the main and only center supplying blood in Qatar to all private and public institutions since 1987. It opens daily except Fridays (closed) from 7:00 AM until 9:00 PM. Qatar is one of the leading countries in blood donation services in terms of advanced equipment, one of which is the treatment of plasma and platelets to reduce the risk of infection. The Blood Donor Center operates according to American Association of Blood Bank [AABB] standards to have an internally accepted management system with a highest level of quality for both donors and patients. The blood donation process takes around 30 to 45 mins and

involves four steps; registration of donor (5 mins), pre-donation screening (5 mins), blood withdrawal (15-20 mins) and post donation resting (15-20 mins). During the registration step, the donor will be asked to complete the registration form, sign the consent form and answer few questions related to medical history, lifestyle and travel history to ensure that the donor is physically and physiologically fit to donate blood. The pre-donation screening step include short health exam test measuring blood pressuring, temperature, pulse, weight and hemoglobin level. The third step involves blood withdrawal in a donor bed, where one unit of blood will be collected (about 450 ml) using antiseptic techniques. In the last step, donor will be asked to rest for 15-20 minutes and will be offered drinks and snacks. Donors will be discharged by the in-charge nurse, and will be given instructions for the limited activities in the next 24 hours after donation such as vigorous exercise, racing and carrying high weight. Other than donating in the Blood Donor Center, Hamad Medical Cooperation also arrange for mobile donation unit available for donating blood in cooperation with different ministries, universities, mall centers, etc.

According to the World Health Organization, the need of blood is increasing rapidly, where every 2 seconds someone needs blood in United States. This is due to the rise of chronic diseases, traumas, cancers and accidents. Worldwide, it has been estimated that annually approximately a total of 234 million people perform surgical operations, out of these 63 million people performing surgery because of traumatic injuries, 31 million for cancer treatments, and 10 million for pregnancy complications. Road traffic accidents has been estimated to kill 12 million people and disable between 20-50 million each year (WHO, 2010).. It has been predicted that road accidents would be the third largest cause of global burden of disease in 2020. In all the mentioned cases, blood is needed urgently during the first 24 hours of treatment. Blood can only be stored

for a limited time; thus, there is an urgent need for regular blood supply to be available once needed at the right time and at the right place. Unfortunately, out of 38% eligible blood donors, only 10% donate blood (WHO, 2010). Therefore, many countries have been facing shortage of blood donations to meet the current clinical demand, especially in developed countries that has a lot of advances in the medical field and surgical procedures .

The imbalance of blood supply and demand require continuous efforts to develop new strategies and frameworks to recruit more blood donors. Therefore, understanding the knowledge level, motivators and barriers is extremely important to establish successful strategies. Many studies and blood recruitment strategies have especially focused on young adults group because older people may need blood transfusion in the next few years, and thus targeting young adults is extremely important to ensure adequate blood supply for the next few years (Suen, Siu, Lee, & Chan, 2020). Knowledge is an important factor for blood donation as it is believed that people are motivated to donate blood when they are well informed about the facts, myths and fears related to blood donation (Alfouzan, 2014). Motivators for donating blood include altruism (helping patients), reluctant altruism (being pressured from society), subjective norms (being influenced by friends), reciprocity (availability for self, family or friends), incentives, curiosity, and others (Table 1) (Ou-Yang et al., 2017). On the other hand, the barriers and obstacles to donate blood include medical reasons, fear (needles, feeling dizzy, etc.), lifestyle barriers, , lack of marketing communication, lack of knowledge about donating, and negative experiences and attitudes (Table 2) (Ou-Yang et al., 2017).

Although factors that contribute to the willingness to donate blood has widely been investigated, it may vary from country to country. This is due to differences in

traditions, culture, religion and level of education. To our knowledge, this is the first study in Qatar that aims in assessing knowledge level and identify motives and barriers that affect the willingness to donate blood among young adults.

Table 1. Association between Theoretical Motivations and Choices

<b>Motivators</b>	<b>Choices</b>
<b>Pure altruism</b>	Helping patients
<b>Reluctant altruism</b>	Under pressure from society or the company
<b>Subjective norms</b>	Being persuaded by friends
<b>Reciprocity</b>	Future availability of blood for self or family
<b>Incentives</b>	Getting subsidies or vacation from the company Attractive incentives Health benefits Free check for blood type and health
<b>Curiosity</b>	Being curious
<b>Others</b>	Commemorating a special date

Table 2. Association between Theoretical Deterrents and Choices

<b>Deterrents</b>	<b>Choices</b>
<b>Low self-efficacy</b>	Self-perception of poor health Time constraint Having no chance
<b>Fear</b>	Fear Feeling unsafe about blood donation Worries about illegal blood transactions Limitation of activities after donation
<b>Inconvenience</b>	No blood donation stations near the workplace or home Inconvenient locations and hours of blood donation sites
<b>Lack of knowledge</b>	Being unfamiliar with the blood donation policy
<b>Negative attitudes</b>	Discouragement from family
<b>Others</b>	Failing to meet the requirements

### *1.2 Objectives*

*General Objective:* To assess the level of knowledge towards blood donation, and to identify the factors that contribute to the willingness to donate blood among young adults at Qatar University

### *Specific objectives*

- 1- To assess the level of knowledge regarding blood donation among young adults at Qatar University and its correlation to the willingness to donate blood
- 2- To identify the motives that encourage young blood donors to donate blood at Qatar and its association with different sociodemographic variables
- 3- To identify the barriers that prevents young non-donors from donating blood at Qatar and its association with different sociodemographic variables
- 4- To identify the most effective way of promoting blood donation among young adults at Qatar
- 5- To predict whether introducing a mobile application will help in promoting blood donation among young adults at Qatar

### *1.3 Research questions*

- 1- Do young adults who have sufficient knowledge about blood donation are more willing to donate blood compared to non-donors?
- 2- What are the most common motivators that encourage young blood donors to donate blood at Qatar?
- 3- What are the most common barriers that prevent young non-donors from donating blood at Qatar?
- 4- What are the most effective ways of promoting blood donation among young adults at Qatar?
- 5- Will a mobile application help in promoting blood donation blood among young adults at Qatar?

## CHAPTE TWO: LITERATURE REVIEW

This chapter provides an overview of major previous research publications that is relevant to the topic described in chapter one. An electronic literature search was conducted using four search engines (PUBMED, SCOPUS, SCIENCE DIRECT, GOGLE SCHOLAR) from February until March 2020. Several search terms were combined to retrieve wide range of studies such as (blood or apheresis) AND (donor OR donation OR recruitment) AND (knowledge OR awareness OR motivation OR motivators OR intention OR barriers OR deterrents). Articles were identified and screened based on the title and the abstract. The inclusion criteria were (i) **context and langrage**: recent published articles since 2009 in a peer-reviewed journal in English, (ii) **relevance**: must be first-person self-report about either knowledge, motivators or barriers, (iii) **study design**: included quantitative and qualitative studies that examined knowledge, motivators or barriers, (iv) **participants**: included blood donors (first-time, repeat, lapsed), and non-blood donors. Articles that are not in English language and others did not meet the selection criteria were excluded.

### *2.1 Knowledge towards blood donation*

It has been reported by several studies that people with higher knowledge level about blood donation are more willing to donate blood than others. In a recent study among 542 college students at China, it has been estimated that it is more likely to donate blood by 1.12 times with every 1 score increase in knowledge (Suen et al., 2020). In another study also performed in China among continuing medical education students, it has been reported that blood donors have statistically significant higher knowledge score than non-donors (Gao & Wang, 2017). In Saudi Arabia, a study performed among 598 college students has reported that 81.7% of blood donors showed a sufficient level of knowledge (answered at least 8 questions out of 12 correctly) compared to only 51%



of non-blood donors, highlighting that non-blood donors demonstrated remarkably lower level of knowledge (Alsalmi, Almalki, Alghamdi, & Aljasir, 2019). Other studies from Saudi Arabia, India, Malaysia have also reported that donors are more knowledgeable about blood donation (Alfouzan, 2014; Chauhan, Kumar, & Thakur, 2018; Chin, 2018; Mishra, Sachdev, Marwaha, & Avasthi, 2016; Mohd Yusoff, 2018). Interestingly, a cross sectional study carried out in Jordan among 500 participants (donors and non-donors) has reported that only 28.6% of the participants, including both groups (donors and non-donors), have adequate level of knowledge above the average (Abderrahman & Saleh, 2014).

These findings highlight the importance of knowledge and awareness about blood donation as a contributing factor affecting the decision of donating blood. Therefore, measuring the level of knowledge and increasing the awareness about blood donation will ultimately result in increasing the willingness to donate blood.

## *2.2 Motivators*

Blood donors are motivated to donate blood for different reasons. One of the theories concerned about different motivators that affect peoples' choices is self-determination theory, which states that people are motivated either internally (e.g. self-satisfaction) or externally (e.g. peer pressure, incentives). The theory states that people are more likely to be motivated internally than externally. The blood donor identity survey developed by (France et al., 2014) relies on self-determination theory in which it serves as an assessment for donation intentions and predictor for future donation behavior by addressing both internal motivators and external motivators. The blood donor identity survey has been used by several studies, one of them in China by (Suen et al., 2020) among college students. The study findings correspond to the theory of self-determination as they have found that internal motivator rather than external drive

blood donation decisions and behaviors. This internal motivator is altruism, pure moral act of helping other patients. Another study in China has also reported that blood donors (68.2%) has most frequently chosen altruism as the principle motivating factor for their intention to donate blood (Ou-Yang et al., 2017). It has also been reported in Malaysia, in a study performed among general population that 98.7% of the respondents has donated blood for the reason of helping others (altruism) (Chin, 2018; Mohd Yusoff, 2018). In Saudi Arabia, it has also been concluded that altruism is the main motivator behind the intention to donate blood since 90% of the health profession student participants (donors, non-donors) reported that they are willing to donate to anonymous patients (Alsalmi et al., 2019). It is interesting to note that a study done in Japan has compared motivators to donate blood between donors and non-donors and reported that altruism has been the most frequently chosen motivator for both groups (91% donors, 92% non-donors) highlighting the importance of altruistic act as a motivator among even non-donors (Ngoma et al., 2013). Other studies in Turkey, Ghana and Germany also reported that helping other people either a family member, a friend, or patients is the main motivational factor for blood donors regardless of their donation status (Karacan, Cengiz Seval, Aktan, Ayli, & Palabiyikoglu, 2013; Mohammed & Essel, 2018; Suemig et al., 2017)

However, motivators other than altruism have been reported as the principle motivators in other countries. For example, in Unites States, a study done among African Americans college students to evaluate motivators to donate blood in donors and non-donors. The findings of the study indicated that convenient place to donate was the most frequently reported motivator (89% donor, 82% non-donor), followed by university activities in promoting blood donation (80% donor, 79% non-donor), and feeling of self-satisfaction (81% donor, 77% non-donor) (Shaz et al., 2009). Another

study in US among African American population reported that the most frequent motivators among blood donors were the donation time less than one hour (76%) followed by being asked (75%) (James, Schreiber, Hillyer, & Shaz, 2012).

Although, altruism is the main motivator for blood donation reported by many studies, other studies have also reported different motivators. This may be due to cultural and religious differences, and thus, it is important to compare these differences in order to encourage more people to donate blood.

### *2.3 Barriers*

Only 10% of eligible blood donors actually donates blood; thus, it is important to understand why eligible blood donors do not donate blood in order to motivate them. Several studies have investigated the barriers or deterrents for donating blood. To investigate the barriers, some studies included non-donors only who never donated blood, and other have included blood donors who have already donated blood. This helped to understand what prevented them from donating blood again (lapsed donors), and other studies have compared both.

A study in France has compared the barriers of donating blood between non-blood donors, and lapsed donors. Lapsed donors has more frequently reported lack of time compared to non-donors. Whereas, non-donors have reported fear of needles and lack of information as more frequently than lapsed donors (Duboz & Cunéo, 2010). Another study in Japan has also compared the barriers between donors and non-donors, and has identified fear as being the only significant variable ( $P < 0.05$ ) (Ngoma et al., 2013).

Studies on non-donors has reported contradicting findings regarding barriers that prevent people from donating blood. However, the most common barrier that prevents people from donating blood for the first time in most of the studies is fear,

which includes fear of pain, fear of needles and fear of feeling dizzy. For example, a study in USA reported not having a convenient place the most common reason (32%) followed by fear of needles, pain or discomfort, fear of feeling faint or dizzy, and not knowing where to donate (24%) (James et al., 2012). Another study in Malaysia has also reported that most non-donors among adults participants has chosen fear of needles, pain or discomfort as the reason for not donating blood (Chin, 2018). Other than the fear, it has been reported in China in one study that most non-donors reported that they do not donate blood because of self-perception of poor health (33%) followed by failing to meet requirements (22.3%). This might be due to the low level of awareness of blood donation in China as concluded by the authors (Ou-Yang et al., 2017). Another study in Saudi Arabia has reported different barriers among non-donors other than fear where 52.4% of non-donors have chosen that blood donation did not cross their minds, followed by 45% reporting that they do not have enough time for donating (Alfouzan, 2014).

Another barrier was reported in a study performed in Ghana where 63% blood donor reported poor attitude of staff as a deterrent for donating blood, followed by poor level of privacy during prescreening step of blood donation (50%) (Mohammed & Essel, 2018). Another study done in Netherlands investigated the barriers among blood donors who refused to donate blood again upon authorities call requesting blood. The main barrier reported in this study was time constraints (35%), followed by physical health problems although they were still eligible to donate blood (29%) (Wevers, Wigboldus, de Kort, van Baaren, & Veldhuizen, 2014).

In conclusion, different barriers have been reported within different donation status and within non-donors even in the same country. It is thus important to identify the local barriers in order to come up with suitable strategies to overcome these barriers.

## CHAPTER THREE: METHODOLOGY

### *5.1 Study design and settings*

A descriptive cross-sectional study has been conducted among students at Qatar University. All Students above 18 years has been included in the study. Registered students have been recruited using convenience sampling method by sending an online link to access the questionnaire through Email announcements (appendix B). Data has been collected in a two-week period during March, 2020. The sample size for this study has been estimated to be 370 participants calculated by Cochran's sample size formula with a 95% confidence interval and 5% margin of error.

### *5.2 Ethical approval*

This study has been reviewed and approved by the Institutional Review Board (IRB) of Qatar University prior to initiation. Participation in this study is voluntary, and an electronic online informed consent has been obtained from each participant (Appendix A).

### *5.3 Questionnaire*

The questionnaire used in this study is an online self-administered questionnaire using SurveyMonkey online software (Appendix C). The content of this survey was adapted from previously published validated questionnaires (Alsalmi et al., 2019; James et al., 2012; Ou-Yang et al., 2017; Zucoloto & Martinez, 2018), then it has been translated to Arabic language. The questionnaire has been reviewed by Ms. Minni (head nurse at Blood Donation Center, HMC), Dr. Abdulsalam Ibrahim (consultant at ICU, HMC), Dr. Ibrahim Mustafa (specialist in hematology), Dr. Luqman Thalib (biostatistician) and Dr. Muammer Koc to determine if the content covered by this questionnaire is relevant. Pilot study using face-to-face interviews has been conducted before the actual data collection on 10 participants to evaluate the feasibility and readability of the items for targeted respondents. Participants that were included in the

pilot study were then excluded from the main study. The questions have been reformulated for the ease of understanding according to the comments given by the reviewers and participants in the pilot study. The questionnaire consists of four sections, with a total of 40 questions, of which 4 are open ended questions: Part A, B, C and D, described below:

***Part A: Sociodemographic information and items associated with blood donation status (8 items)***

Items included age, gender, nationality, current academic year, college, and three items associated with blood donation status. Respondents were classified into two groups in this section according to the donation status. First group is **blood donors** if they have donated blood one time or more, and second group is **non-donors** if they have never donated blood.

***Part B: Motivators to donate blood (9 items)***

This section was intended for **blood donors only** and used to assess motivators to donate blood. According to (Ou-Yang et al., 2017), intentions for donating blood include altruism, reluctant altruism, subjective norms, reciprocity, incentives, curiosity, and others (Table 1). These motivators were addressed using a set of questions, and responses were given using a 5-point Likert scale ranging from “Strongly agree” (1) to “Strongly disagree” (5).

***Part C: Barriers to donate blood (11 items)***

This section was intended for **non-donors only** and used to assess barriers for blood donation. According to (Ou-Yang et al., 2017), the reasons for not donating blood include low self-efficacy, fear, inconvenience, lack of knowledge, negative attitudes and others. These barriers are summarized in Table 2. The barriers were addressed using a set of questions, and responses were given using a 5-point Likert scale ranging from

“Strongly agree” (1) to “Strongly disagree” (5).

***Part D: knowledge assessment on blood donation (8 items)***

The knowledge assessment questions were constructed based on a validated survey established by (Zucoloto & Martinez, 2018). In this paper, the content validity ratio (CVR) has been calculated for 24 items, of those 8 items with the highest CVR has only been included. It consists of 8 items that requires true or false responses. The score range is 0 to 8, where a higher score reflects better knowledge level towards blood donation.

***Part E: effective ways of promotion for blood donation (3 items)***

This section has been developed to predict the most effective ways of promoting blood donation and to estimate the need of developing a mobile technology in Qatar. Assessing the most effective ways of promoting blood donation question has been done according to the work established by Ou-Yang et al., 2017. Whereas, the question related to the features of mobile technology has been established based on several studies that has established a mobile technology for blood donation (Foth, Satchell, Seeburger, & Russell-Bennett, 2013; Kayode, Adeniyi, Ogundokun, & Ochigbo, 2019).

*5.4 Data analysis*

Results of the questionnaire were extracted using Excel and then imported and analyzed using SPSS version 26 (IBM Statistics, Chicago, IL, USA). Significant associations between sociodemographic variables and blood donation status were examined using chi-squared test since these are two categorical variables. Chi-squared test was also used to assess the association of each question in knowledge assessment quiz with donation status. Independent t-test was used to compare the mean knowledge score of blood donors and non-blood donors to determine if there is any association between knowledge level and the action of donating blood. Frequency calculations were used to

analyze barriers and motivators, and each item of the barriers and motivators were analyzed in terms of association with age and gender using chi-squared test.



## CHAPTER FOUR: RESULTS

A Total of 590 questionnaire responses were collected from students at Qatar University, 118 were excluded due to incomplete responses, resulting in a total of 472 complete responses for analysis (80% completion rate). Although the questionnaire has been distributed via Email announcements to both females and males, the majority of the respondents were female (79.5%), and only 20.9% were male. The distribution of gender in our study is similar to the distribution of students at Qatar University where only 20% of current registered students are males. Among the respondents, 72 (15.3%) were blood donors and 400 non-blood donors (Table 3). For blood donors, 49 (71.0%) has donated blood only once within the past one year, 12 (17.4%) has donated twice, 7 (10.1%) has donated three to four times, and 1 (1.45%) has donated more than five times.

### *4.1 Sociodemographic characteristics and association with blood donation status*

We found an association between gender ( $P < 0.001$ ) and age ( $P = 0.002$ ) with the donation status (Table 3). In other words, more males than females are more likely to donate blood, where 34 out of 97 males were blood donors accounting for 35.1% of the male participants, compared to only 38 out of 375 females were blood donors accounting for 10.1% only, and this proportion difference is statically significant (Figure 1). Also, the majority of age group older than 24 years in both genders donated blood (26.8%), which is highest proportion compared to other age groups (Figure 2). No significant association between nationality, current academic year and major with blood donation status were found ( $P = 0.889$ ,  $P = 5.683$  and  $P = 0.300$  respectively) (Table 3)

Table 3. Univariate Association between Sociodemographic Characteristics Donor Status of Respondents (N=472)

Variable	Total (n=472)	Non-blood donor (n=400)	Blood donor (n=72)	X <sup>2</sup>	P	df
<b>Gender</b>						
Male	97 (20.6%)	63 (64.9%)	34 (35.1%)	37.02	<b>&lt;0.001*</b>	1
Female	375 (79.4%)	337 (89.9%)	38 (10.1%)			
<b>Age</b>						
18-19	168 (35.6)	154 (91.7%)	14 (8.3%)	14.95	<b>0.002*</b>	3
20-21	164 (34.7%)	138 (84.1%)	26 (15.9%)			
22-23	58 (12.3%)	38 (82.8%)	10 (17.2%)			
>24	82 (17.4%)	60 (73.2%)	22 (26.8%)			
<b>Nationality</b>						
Qatari	225 (47.7%)	187 (83.1%)	38 (16.9%)	0.889	0.346	1
Non-Qatari	247 (52.3%)	213 (86.2%)	34 (13.8%)			
<b>Academic Year</b>						
Freshman	120 (25.4%)	103 (85.8%)	17 (14.2%)	5.683	0.224	4
Sophomore	108 (22.9%)	96 (88.9%)	12 (11.1%)			
Junior	89 (18.9%)	73 (82.0%)	16 (18.0%)			
Senior	112 (23.7%)	96 (85.7%)	16 (14.3%)			
Graduate student	43 (9.1%)	32 (74.4%)	11 (25.6%)			
<b>Major</b>						
Non-Health related	355 (75.2%)	299 (84.2%)	56 (15.8%)	0.300	0.584	1
Health related	117 (24.8%)	101 (86.3%)	16 (13.7%)			

\*Significant p-value

#### *4.2 Comparison on methods of hearing about blood donation between blood donors and non-blood donors*

The most common ways of hearing about blood donation by both groups (blood donors, non-blood donors) are social media (61% donors, 72.5% non-donors) and family/relatives (61% donors, 57.8% non-donors) (Table 4, Figure 3). Only 4 participants (0.8%) have never heard about blood donation. It is important to note that the percentage in the total column does not add up to 100% because participants can

select more than one response. Other methods reported in open-ended questions include Emails, school and blood donation units available at the university.

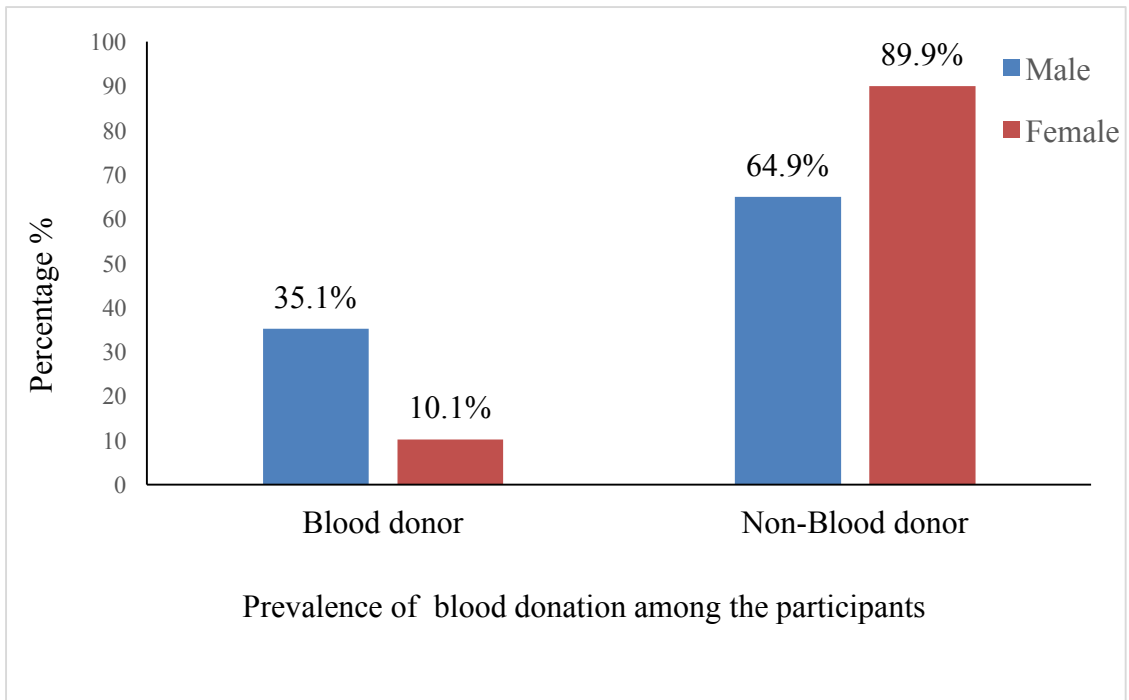


Figure 1. Association between blood donation status and gender.

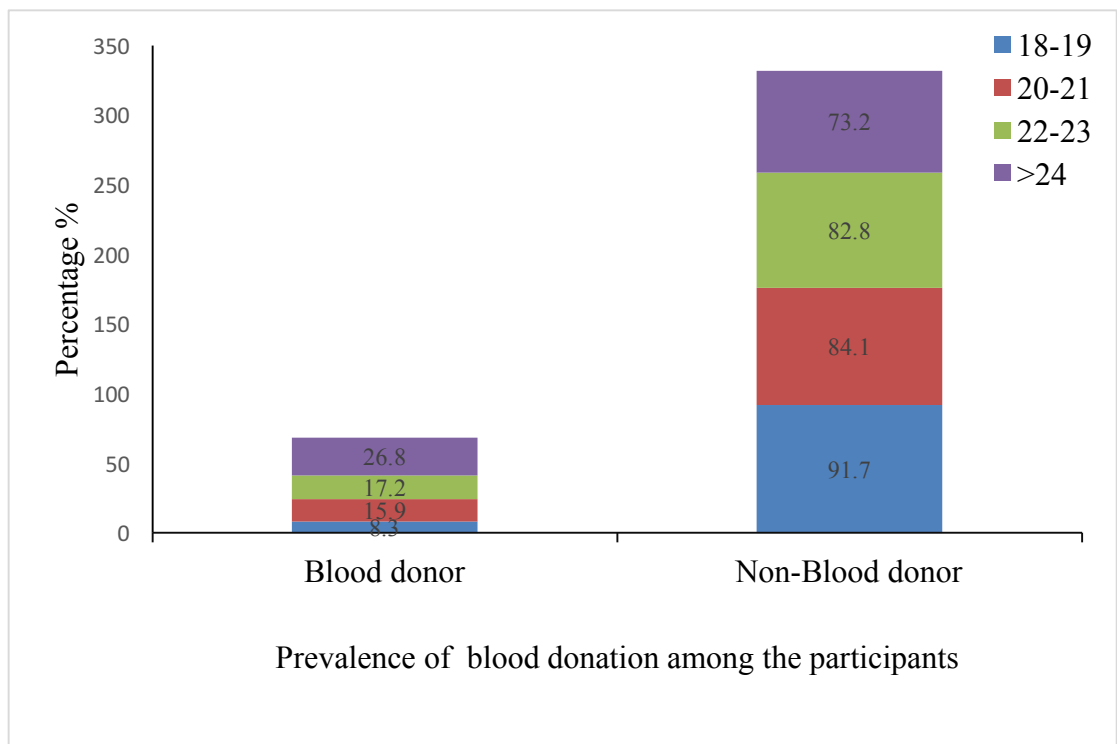


Figure 2. Association between blood donation status and age group.

Table 4. Comparison on Methods of Hearing about Blood Donation between Blood Donors and Non-Blood Donors

	Blood donation status		Total
	Blood donor	Non-blood donor	
Friends/relatives	44 (61.1%)	231 (57.8%)	275 (58.6%)
Television /Radio/ Newspaper	29 (40.3%)	168 (42.0%)	197 (42.0%)
Social media	44 (61.1%)	290 (72.5%)	334 (71.2%)
Awareness campaign at university	31 (43.1%)	151 (37.8%)	182 (38.8%)
Awareness campaign at shopping mall	20 (27.8%)	101 (25.3%)	121 (25.8%)
Educational lecture	8 (11.1%)	37 (9.3%)	45 (9.6%)
I have never heard of blood donation	2 (2.8%)	2 (0.5%)	4 (0.8%)
Others	4 (5.6%)	10 (2.5%)	14 (2.9%)

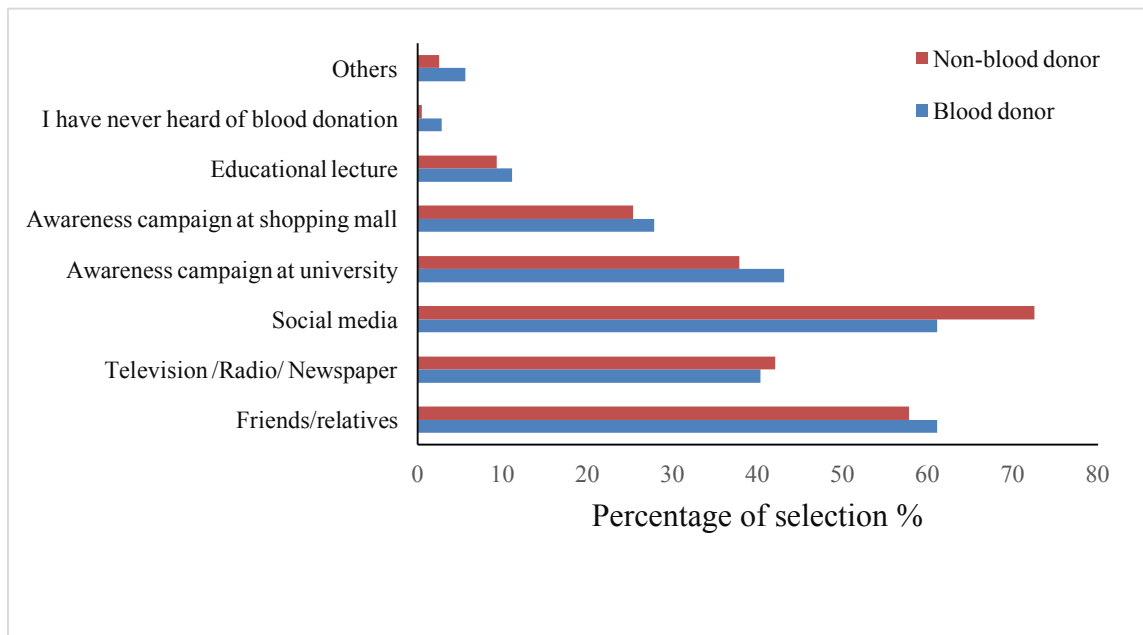


Figure 3. Comparison on methods of hearing about blood donation between blood donors and non-blood donors.

#### 4.3 Knowledge level toward blood donation

Knowledge level was assessed and compared between blood donors and non-

blood donors to determine if it affects the decision of donating blood. On average, blood donors had a higher mean knowledge score ( $M=63.9\%$ ,  $SD=19.8$ ) than non-blood donors ( $M=59.8\%$ ,  $SD=20.0$ ) (Table 5). However, independent t-test indicates that this difference was not significant  $t(470)=1.560$ ,  $p>0.05$  (Table 5). This suggests that the level of knowledge about blood donation has no effect on the decision of donating blood. Although the t-test did not indicate any significant difference between the mean score of the knowledge score between blood donors and non-blood donors, the chi-squared test of individual questions indicated that there is an association between 6 questions out of a total of 12 questions and blood donation status with a p-value of  $<0.05$  (Table 5). We found that blood donors were more knowledgeable about their blood type. Also, about the length of donation process where 72% of blood donors and 43% only of non-blood donors answered correctly. Blood donors also had knowledge about knowing the need to be fasting when donating blood (blood donors: 76%, non-blood donors: 44.5%). The other 3 questions were testing the participants' knowledge regarding the eligibility of blood donation such as the eligibility of a person with diabetes or high blood pressure, a person with fever, and breastfeeding woman (Table 5).

Table 5. Knowledge Level Towards Blood Donation among Blood Donors and Non-Blood Donors

	Total (n=472)	Donors (n=72)	Non-donors (n=400)	Test statistics and p-value
1. Do you know your blood type?				
Yes-	433 (91.7%)	71 (98.6%)	362 (90.5%)	0.021*
No	39 (8.3%)	1 (1.4%)	38 (9.5%)	
2. Can a donor be infected by donating blood?				
Yes	192 (40.7%)	37 (51.4%)	155 (38.8%)	0.130*
No-	147 (31.1%)	19 (26.4%)	128 (32.0%)	
I don't know	133 (28.2%)	16 (22.2%)	117 (29.3%)	

- correct response, \*chi squared test, \*\* independent t-test

	Total (n=472)	Donors (n=72)	Non-donors (n=400)	Test statistics and p-value
3. Will your blood be tested before transfusing it to other people?				
Yes-	389 (82.4%)	62 (86.1%)	327 (81.8%)	0.557*
No	11 (2.3%)	2 (2.8%)	9 (2.3)	
I don't know	72 (15.3)	8 (11.1%)	64 (16.0)	
4. How long does the donation process take one the person enters the donation room?				
Yes-	216 (45.8%)	31 (43.1%)	185 (46.3%)	0.262*
No	47 (10.0%)	11 (15.3)	36 (9.0%)	
I don't know	209 (44.3%)	30 (41.7%)	179 (44.8%)	
4. How long does the donation process take one the person enters the donation room?				
20 mins-	225 (47.7%)	52 (72.2%)	173 (43.3%)	<0.001*
30 mins to 1 hour	76 (16.1%)	13 (18.1%)	63 (15.8%)	
More than 1 hour	4 (0.8%)	1 (1.4%)	3 (0.8%)	
I don't know	167 (35.4%)	6 (8.3)	161 (40.3%)	
5. Should the blood donor be fasting?				
Yes	82 (17.4%)	10 (13.9%)	72 (18.0%)	<0.001*
No-	233 (49.4%)	55 (76.4%)	178 (44.5%)	
I don't know	157 (33.3%)	7 (9.7%)	150 (37.5%)	
6. Can a person with diabetes or high blood pressure donate blood?				
Yes	47 (10.0%)	12 (16.7%)	35 (8.8%)	0.044*
No-	309 (65.5%)	39 (54.2%)	270 (67.5%)	
I don't know	116 (24.6%)	21 (29.2%)	95 (23.8%)	
7. Can a person with fever donate blood?				
Yes	30 (6.4%)	6 (8.3%)	24 (6.0%)	0.044*
No-	306 (64.8%)	54 (75.0%)	252 (63.0%)	
I don't know	136 (28.8%)	12 (16.7%)	124 (31.0%)	
8. Can a pregnant woman donate blood?				
Yes	12 (2.5%)	3 (4.2%)	9 (2.3%)	0.090*
No-	350 (74.2%)	46 (63.9%)	304 (76.0%)	
I don't know	110 (23.3%)	23 (31.9%)	87 (21.8%)	
9. Can a menstruating woman donate blood?				
Yes	42 (8.9%)	7 (9.7%)	35 (8.8%)	0.178*
No-	281 (59.5%)	49 (68.1%)	232 (58.0%)	
I don't know	149 (31.6%)	16 (22.2%)	133 (33.3%)	
10. Can a breastfeeding woman donate blood?				
Yes	48 (10.2%)	16 (22.2%)	32 (8.0%)	<.001*
No-	264 (55.9%)	33 (45.8%)	231 (57.8%)	
I don't know	160 (33.9%)	23 (31.9%)	137 (34.3%)	

- correct response, \*chi squared test, \*\* independent t-test

	Total (n=472)	Donors (n=72)	Non-donors (n=400)	Test statistics and p-value
11. Can blood be stored for more than 24 hours if not used immediately?				
Yes-	274 (58.1%)	41 (56.9%)	233 (58.3%)	
No	26 (5.5%)	8 (11.1%)	18 (4.5%)	0.070
I don't know	172 (36.4%)	23 (31.9%)	149 (37.3%)	
knowledge mean score	60.5%	63.9%	59.8%	t(470)=1.560** p=0.119
Standard deviation	20.0	19.8	20.0	95% CI: 1.04 to 9.02
highest score	100%	100%	100%	
lowest score	0%	8.33%	0%	

- correct response, \*chi squared test, \*\* independent t-test

#### 4.4 Motivators of donating blood (donors)

The most common motivators reported by blood donors are donating to help patients (87.5% strongly agree, 9.7% agree), followed by having a blood mobile unit come to your place (63.9% strongly agree, 19.4% agree), and when someone I know is in need (66.7% strongly agree, 12.5% agree) (Table 6).

Each motivator item was analyzed by gender and age using chi-squared test because they were previously has been found to be associated with blood donation status (section 4.1). Significant associations were found between age and when someone I know is in need (Table 7). Blood donors older than 24 years agreed more than others that they have donated blood previously when someone they know is in need (90.9% strongly agree) (Figure 4). No significant associations between any of the motivators and gender.

Additional 8 (1.7%) blood donors provided additional comments for open-ended question about other motivators such as health benefits gained by blood donation, religious responsibility and trying new experiences (Appendix D).



Table 6. Motivators towards Blood Donation (N=72)

	Strongly agree (%)	Agree (%)	Neither agree nor disagree (%)	Disagree (%)	Strongly disagree (%)
a) Donating to help patient	87.5%	9.7%	2.8%	0%	0%
b) When someone I know is in need	66.7%	12.5%	13.9%	2.8%	4.2%
c) Friends or family who are donors had influence on me	29.2%	22.2%	23.6%	11.1%	13.9%
d) Incentives for donation (free gifts, food, vacation)	11.1%	6.9%	16.7%	20.8%	44.1%
e) Free health check	15.3%	22.2%	19.4%	15.3%	27.8%
f) The place of blood donation center is convenient	31.9%	30.6%	25.0%	6.9%	5.6%
g) Convenient working hours of blood donation center	23.6%	27.8%	37.5%	6.9%	4.2%
h) Having a blood mobile unit come to your place of work or other place	63.9%	19.4%	11.1%	1.4%	4.2%
i) Additional comments (open-ended questions)	1.7%				

Table 7. Association between Gender/Age and Blood Donation Motivators

	p-value (gender)	p-value (age)
a) Donating to help patient	0.113	0.097
b) When someone I know is in need	0.307	<0.002*
c) Friends or family who are donors had influence on me	0.699	0.783
d) Incentives for donation (free gifts, food, vacation)	0.153	0.202
e) Free health check	0.237	0.590
f) The place of blood donation center is convenient	0.553	0.517
g) Convenient working hours of blood donation center	0.848	0.951
h) Having a blood mobile unit come to your place of work or other place	0.454	0.545

\*significant p-value

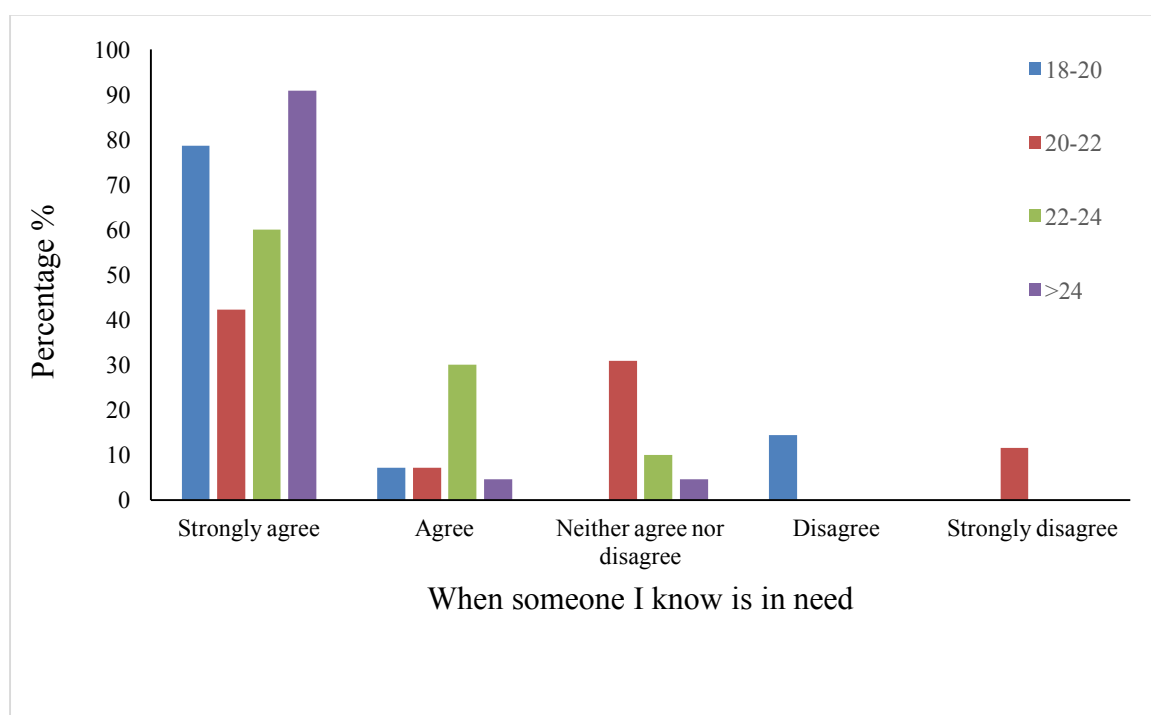


Figure 4. Association between age and blood donation motivators (When someone I know is in need) (n=72).

#### 4.5 Barriers of donating blood (non-blood donors)

The most common barriers reported by non-blood donors are failing to meet the

requirements (26.3% strongly agree, 18.8% agree), followed by no one ever asked me to give blood (13.8% strongly agree, 31.3% agree) (Table 8),

Each barrier item was analyzed by gender and age using chi-squared test because they were previously has been found to be associated with blood donation status (section 4.1). Significant associations were found between gender and I do not think there is a need to donate blood, no one ever asked me to donate blood, and failing to meet the requirement (Table 9). No significant associations between any of the barriers and age. More males than females agreed to I do not think there is a need to donate blood (males: 3.2% strongly agree, 6.3% agree versus females: 0.9% strongly agree, 1.2% agree) (Figure 5). Also more males than females agreed to no one ever asked me to donate blood (males: 23.8% strongly agree, 42.9% agree versus females: 11.9% strongly agree, 29.1% agree) (Figure 6). However, more females than males agreed to failing to meet the requirements (males: 11.1% strongly agree, 15.9% agree versus females: 29.1% strongly agree, 19.2% agree) (Figure 7).

Additional 55 (11.7%) non-blood donors provided additional comments for open-ended question about other barriers such as fear of getting infections during donation process, family/parents discouragement and refusal, no transportations available, I do not know the place and conditions for donating, etc. (Appendix E)

Table 8. Barriers towards Blood Donation (N=400)

	Strongly agree (%)	Agree (%)	Neither agree nor disagree (%)	Disagree (%)	Strongly disagree (%)
a) I do not think there is a need to donate blood	1.3%	2.0%	7.0%	26.3%	63.5%
b) I might get HIV or AIDS from giving blood	1.5%	8.8%	20.0%	26.5%	43.5%
c) No one ever asked me to give blood	13.8%	31.3%	22.5%	18.3%	14.2%
d) Failing to meet the requirements (body weight, blood pressure, hemoglobin, etc.)	26.3%	18.8%	19.3%	18.3%	17.5%
e) Fear (needles, feeling dizzy, etc.)	12.8%	19.8%	9.8%	26.0%	31.8%
f) I do not have time to donate blood	7.5%	17.8%	24.3%	24.5%	26.0%
g) I do not know where to donate blood	10.5%	21.8%	12.3%	26.5%	29.0%
h) Inconvenient hours for blood donations sites	5.3%	11.8%	36.3%	23.3%	23.5%
i) Inconvenient locations for blood donations sites	6.5%	14.2%	31.5%	24.5%	23.3%
j) Limitation of activities after donation	2.8%	9.5%	35.8%	26.0%	26.0%
k) Additional comments (open-ended questions)	11.7%				

Table 3. Association between Gender/Age and Blood Donation Barriers

	p-value (gender)	p-value (age)
a) I do not think there is a need to donate blood	<0.008*	0.063
b) I might get HIV or AIDS from giving blood	0.676	0.554
c) No one ever asked me to give blood	<0.003*	0.924
d) Failing to meet the requirements (body weight, blood pressure, hemoglobin, etc.)	<0.005*	0.504
e) Fear (needles, feeling dizzy, etc.)	0.381	0.805
f) I do not have time to donate blood	0.782	0.579
g) I do not know where to donate blood	0.125	0.493
h) Inconvenient hours for blood donations sites	0.273	0.495
i) Inconvenient locations for blood donations sites	0.446	0.929
j) Limitation of activities after donation	0.192	0.556

\*significant p-value

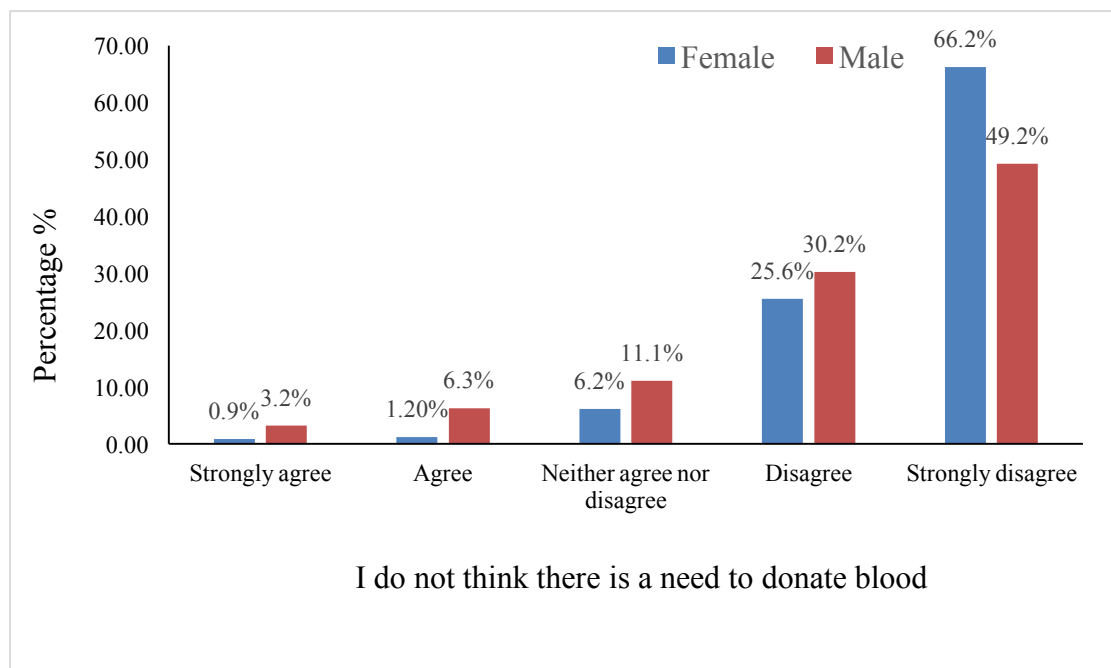


Figure 5. Association between gender and blood donation barriers (I do not think there is a need to donate blood) (n=400).

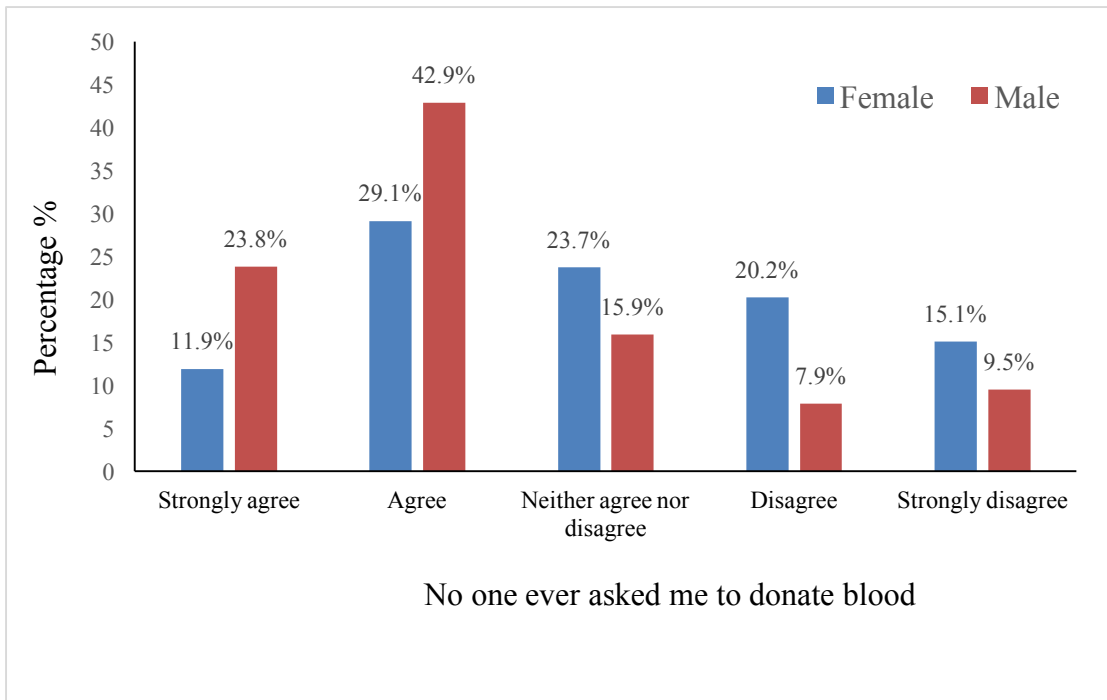


Figure 6. Association between gender and blood donation barriers (No one ever asked me to donate blood) (n=400)

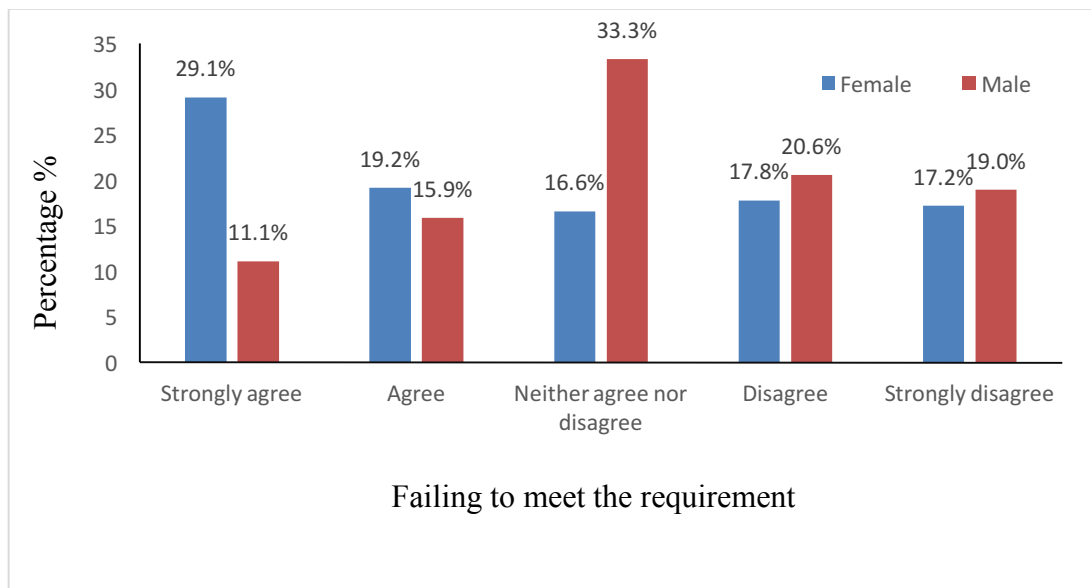


Figure 7. Association between gender and blood donation barriers (Failing to meet the requirements) (n=400).

#### 4.5 Effective ways of promoting blood donation

The most effective ways of promoting blood donation selected by all participants are raising the awareness of blood donation (81.3%), followed by providing

mobile blood donation system (66.2%), and developing a mobile technology for blood donation (62.1%) (Figure 8). Additional comments provided by 21 (4.5%) participants include using influencers to promote blood donation, providing home services, providing mobile unit for donation at public places weekly etc. (Appendix F)

Most of the participants agreed that developing a mobile application would in promoting blood donation (49.4% strongly agree, 33.7% agree). The most helpful features of mobile application that have been thought to be useful selected by all participants include viewing locations of the closest donation center or mobile unit (84.5%). Followed by sending notifications where there is a need for specific blood group that matches the donor blood group (77.68%), scheduling appointments (72.21%), and filling donor questionnaire before going to blood donation center to speed up the process (63.1%) (Figure 9). Other features reported in open-ended question include assessing blood donor's information and eligibility, providing daily updates about the blood needed at HMC, showing cases that are in need of blood to form emotional bond, etc. (Appendix G).

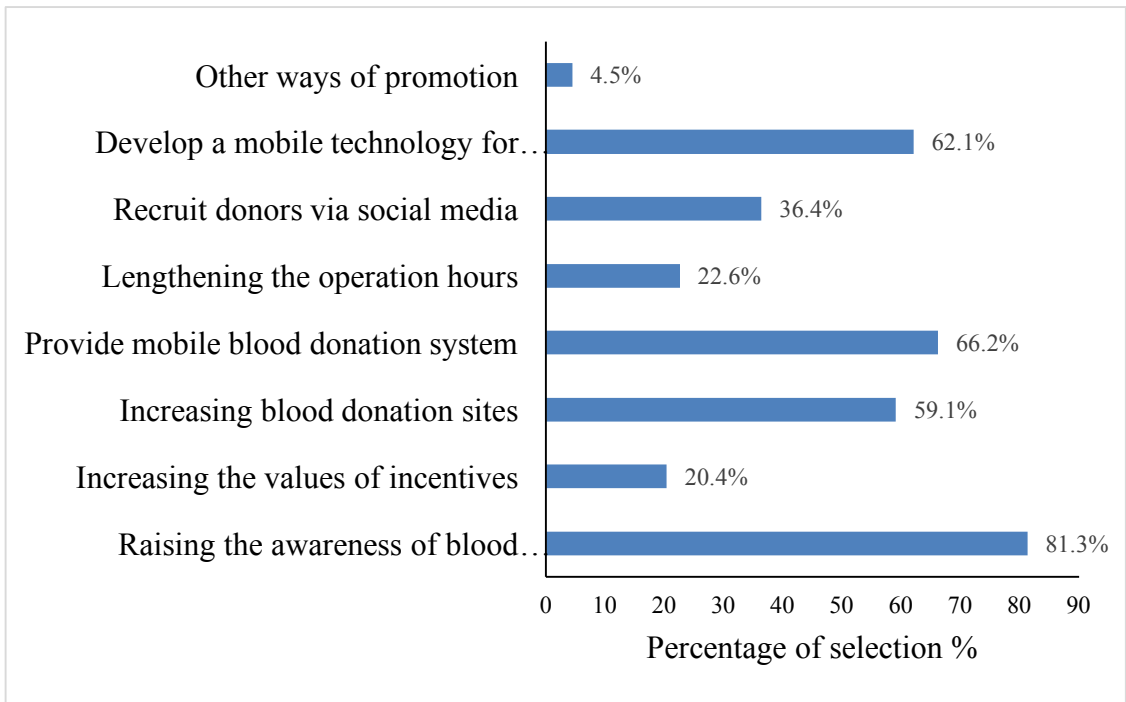


Figure 8. Effective ways of promoting blood donation selected by all participants (n=472).

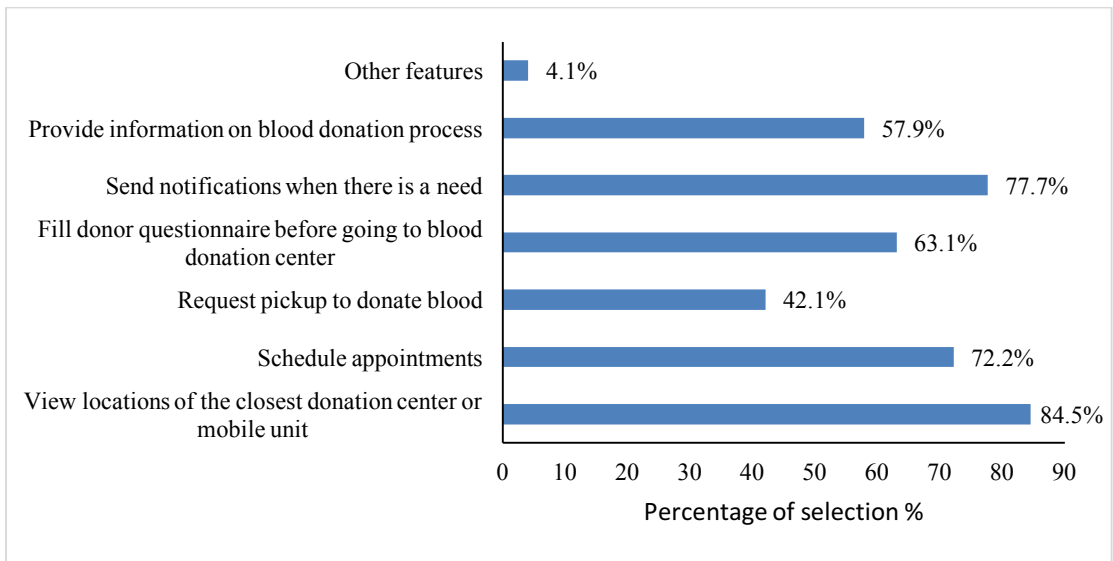


Figure 9. Helpful features of mobile technology selected by all participants (n=472).



## CHAPTER FIVE: DISCUSSION

### *5.1 Summary of study findings*

Out of the 472 participants, 72 (15%) were blood donors. Gender was found to be significantly associated with blood donation status, where 35% of males donated blood compared to only 10.1% of females (Table 3). Significant associations were also found between age and blood donation status, where 26.8% of participants aged older than 24 donated blood (Table 3). The most common way of hearing about blood donation selected by most participants are social media (71.2%) and relatives/friends (58.6%) (Table 4). The total knowledge score has not been found to be significantly associated with blood donation status, suggesting that knowledge level has no effect on the decision of donating blood. However, 6 out of 12 knowledge questions has been associated with blood donation status (Table 5).

The most common motivator reported by blood donors is donating to help people (87.5% strongly agree, 9.7% agree), followed by having a blood mobile unit come to your place (63.9% strongly agree, 19.4% agree), and when someone I know is in need (66.7% strongly agree, 12.5% agree) (Table 6). The most common barriers reported by non-blood donors are failing to meet the requirements (26.3% strongly agree, 18.8% agree), followed by no one ever asked me to give blood (13.8% strongly agree, 31.3% agree) (Table 8). Participants have selected that raising the awareness of blood donation is the most effective way of blood donation (81.3%), followed by providing mobile blood donation system (66.2%), and developing a mobile technology for blood donation (62.1%) (Figure 8). Most of the participants agreed that developing a mobile application would in promoting blood donation (49.4% strongly agree, 33.7% agree), and selected that the most helpful feature of mobile application is viewing locations of the closest donation center or mobile unit (84.5%) (Figure 9).

### *5.2 Sociodemographic characteristics and association with blood donation status*

Although the questionnaire has been distributed via Email announcements to both females and males, only 20% of the respondents were males (Table 3). This can be explained by the low number of male students at Qatar University, where 80% of the students at Qatar University are females. In this case, our sample is considered to be representative of Qatar University students. Gender has found to be significantly associated with blood donation status in our study. In line with previous studies, many countries (United States, Saudi Arabia and India) have also reported a higher percentage of male donors than females (Alsalmi et al., 2019; James et al., 2012; Mishra et al., 2016). However, contradictory findings regarding the association between gender and blood donation status has been reported in China, where both studies have found a significant association but one with more female blood donors, and the others more male blood donors (Ou-Yang et al., 2017; Suen et al., 2020) . A systematic review on 80 publications regarding gender variation in giving blood has concluded that although women are more altruistic than men, they donate blood less frequently because of gender restrictions regarding the frequency of donation, higher rate of deferrals due to low level of hemoglobin, menstrual cycle, and weight requirements, and adverse reactions such as dizziness due to low weight (Bani & Giussani, 2010). However, contradicting findings have been reported in China, and this might be because they allow woman at their menstrual cycle to donate blood as long as they have normal hemoglobin level (Suen et al., 2020).

We found that the age is significantly associated with blood donation status, where a higher percentage of students older than 24 years were blood donors. This has also been reported in China among college students, and it has been hypothesized that this might be due to the study load of students at the first few years of college, and

knowledge level (Suen et al., 2020).

### *5.3 Knowledge level toward blood donation*

Surprisingly, the total knowledge score of participants has not found to be associated with blood donation status in our study, where blood donors and non-blood donors has both very close means of around 60% (Table 5), suggesting that knowledge level does not affect the decision of donating blood. These results were contradictory to what have been reported in previous studies highlighting the association between knowledge level and blood donation status (Alfouzan, 2014; Chauhan et al., 2018; Mishra et al., 2016; Mohd Yusoff, 2018; Suemnick et al., 2017; Suen et al., 2020). Contradictory findings might be due to the small proportions of blood donors in our study that is only 72 out of 472 participants accounting for 15.1% only compared to other studies such as 45.2% proportions of blood donors out a total of 349 participants (Alfouzan, 2014), and 50% proportions of blood donors out of a total of 542 participants (Suen et al., 2020). However, although the overall knowledge score has not been associated with blood donation status, 6 out of 12 question has been associated with blood donation status; thus, knowledge level still plays a major role in the decision of donating blood. The questions in this study might be used to increase the awareness regarding the questions the scored the lowest grade among non-donors.

### *5.4 Motivators*

The most common motivator reported by blood donors is donating to help people (87.5% strongly agree, 9.7% agree), followed by having a blood mobile unit come to your place (63.9% strongly agree, 19.4% agree), and when someone I know is in need (66.7% strongly agree, 12.5% agree) (Table 6). This is an agreement with other studies, where helping patients or else referred to as altruism has been highlighted as one the main reasons for donating blood in different countries such as China, Turkey,

Malaysia and Greece (Chin, 2018; Karacan et al., 2013; Marantidou et al., 2008; Ou-Yang et al., 2017; Suen et al., 2020). The presence of a mobile unit for blood donation in public areas has been highlighted as one of the main motivators in one study in Saudi Arabia (Alfouzan, 2014). The last motivator, which is when someone I know is also referred to family/replacement donors that is those people who give blood when family or friends need blood. In 2012, family/replacement donors has been reported to account for 45% of blood donors in India (Jain & Gupta, 2012).

### *5.5 Barriers*

The most common barriers reported by non-blood donors are failing to meet the requirements (26.3% strongly agree, 18.8% agree), followed by no one ever asked me to give blood (13.8% strongly agree, 31.3% agree) (Table 8). Both barriers were significantly associated with gender; however, failing to meet the requirements has been reported more frequently by females, while no one asked me to give blood was more frequently by males. Interestingly, studies has reported different barriers of blood donation, but the most common barrier that has been reported is fear of needles or feeling dizzy (Chin, 2018; James et al., 2012; Ou-Yang et al., 2017). No one ever asked me to give blood is actually a question adapted from a study in USA; however, in their study only 16% of non-donors agreed to this statement (4% strongly agree, 12% agree) compared to 45% in our study (13.8% strongly agree, 31.3% agree). The findings in our study may be due to poor awareness about blood donation requirements in Qatar, especially that it has already been proven in knowledge assessment section. It is important to highlight that no published studies have been found about awareness of blood donation in Qatar. Also, it might be because of weak promotion campaigns since most of the non-donors reported that they have never been asked to donate blood.

### *5.6 Effective ways of promoting blood donation*

This section was included to understand the preferred way of promoting blood

donation among young adults to give us guidelines and insights that would help us in addressing this issue and developing an effective recruitment system for young adults' blood donors, especially that no studies in Qatar has published regarding blood donation concern. Raising the awareness of blood donation is the most effective way of blood donation (81.3%), followed by providing mobile blood donation system (66.2%), and developing a mobile technology for blood donation (62.1%). This reflects that many students are actually aware that they lack the necessary information about blood donation. For example, one student suggested in an open-ended question to lengthen the hours of blood donation center at HMC instead of mornings only; although, the blood donation center already opens until 9:00 PM every day. At Qatar University, a mobile unit for blood donation (HMC unit) is only provided one time in a year for two days, one day for males and the second day for females from 8:00 AM until 2:00 PM. It is clear from our study that college students get motivated by the mobile unit coming to the university (second most common motivator), and two days is actually not enough to handle more than 20,000 students. Another effective promotion selected by participants is a mobile-phone application, which has not yet been developed in Qatar. A study in Turkey has proposed a system where mobile blood donation visit certain active locations daily at fixed specific time, and the donated blood is then referred to blood donation center at the end of the day (Şahinyazan, Kara, & Taner, 2015). Mobile application has also been proven to be successful in many countries, and many publications have published about proposed mobile applications with the important features for recruitment and retention of blood donors (Alkandari, 2016; Domingos et al., 2016; Fahim, Cebe, Rasheed, & Kiani, 2016; Kayode et al., 2019).

## CHAPTER SIX: LIMITATIONS, CONCLUSION AND RECOMMENDATIONS

### *6.1 Limitations*

The study has some limitations. First we used a cross sectional study with convince sampling method to include only young adults at Qatar University. Although the design and sampling method serves our objective, one might be cautioned that the findings cannot be generalizable to all young adults at Qatar. Another limitation is the low response rate of male participants compared to females. Future research may include participants from differ universities, and additional correlations regarding donation status, knowledge and factors that affect blood donation could be compared between different institutions.

### *6.2 Conclusion and recommendations*

In summary, assessing the knowledge level of both blood donors and non-blood donors and understanding the motives and barriers for blood donation is critical to develop effective strategies to recruit more donors to meet the clinical need. Interestingly, the current study revealed that knowledge level was not associated with donation status. Altruism and the presence of mobile donation units was the main motivator for donating blood among blood donors. Whereas, not meeting the requirements and never been asked to donate blood was the main barriers or reasons for not donating blood. These findings suggest that raising the awareness about blood donation among young adults in Qatar will certainly increase blood donation frequency. Awareness should include the requirements of donating blood, health benefits to blood donors and the urgent need for blood daily. Awareness programs can be done by the collaboration of HMC with universities at Qatar, shopping malls, and social media influencers to spread educational programs are facts about blood donation in a simple and accessible ways to young adults. Moreover, blood donation mobile units should be

provided more frequently at Qatar University or any other public places. More efforts should also be made to attract young adults for blood donation through social media and influencers since it has been indicated in this survey that they have heard about it before through those methods. Finally, mobile blood technology (mHealth) can also be developed to facilitate the connection between blood donors and blood donation center and include features that would motivate people to donate blood.

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## APPENDICES

### APPENDIX A: ONLINE INFORMED CONSENT

<p><b>Dear student,</b></p> <p><b>You are invited to participate in a research study</b> that aims in assessing the knowledge level of blood donation, and identifying the motivators and barriers that affect the willingness to donate blood among young adults at Qatar University.</p> <p><b>Participation in this study is voluntary.</b> You have the right to withdraw from the study at any time, or skip any question(s) that they do not wish to answer.</p> <p><b>Your responses will be completely confidential,</b> and the researcher and/or supervisor will not collect any identifying information such as your name, email address or IP address. Research records or data will be stored electronically on a password protected computer, and all records will be destroyed after 5 years upon completion of collecting data.</p> <p><b>Participating in this will not add any benefit to your academic standing or performance.</b> However, it will help us identify the motivators and barriers of blood donation among young adults Qatar, which will help us in developing future strategies to recruit more blood donors.</p> <p><b>The procedure involves filling an online questionnaire that will take approximately 5-8 minutes.</b></p> <ul style="list-style-type: none"><li>• <b>The questionnaire consists of five parts:</b></li></ul> <p><b>Part A:</b> Sociodemographic information and blood donation status (8 items)</p> <p><b>Part B:</b> Motivators to donate blood (9 items)- <u>for donors only</u></p> <p><b>Part C:</b> Barriers to donate blood (11 items)- <u>for non-donors only</u></p> <p><b>Part D:</b> Knowledge assessment (8 items)</p> <p><b>Part E:</b> Promoting blood donation (3 items)</p> <p>The study is approved by QU-IRB with approval number <b>QU-IRB 1268-EA/20</b>. You may contact them at <a href="mailto:QU-IRB@qu.edu.qa">QU-IRB@qu.edu.qa</a> if you have any question related to the ethical compliance of this research.</p> <p><b>If you have any other questions or concerns, you may contact:</b> <b>Amal Ibrahim (Student)</b> Master's in Biomedical Laboratory Management with Project Option at Qatar University Email: <a href="mailto:amal.ibrahim@qu.edu.qa">amal.ibrahim@qu.edu.qa</a></p>	<p>عزيزي الطالب/الطالبة،</p> <p>أنت مدعو للمشاركة في دراسة بحثية تهدف إلى تقييم مستوى المعرفة بالتبرع بالدم، وتحديد الدوافع والحواجز التي تؤثر على الرغبة في التبرع بالدم بين فئة الشباب في جامعة قطر.</p> <p>المشاركة في هذه الدراسة اختيارية. لديك الحق في الانسحاب من الدراسة البحثية في أي وقت، أو يمكنك تخطي أي سؤال (أسئلة) لا ترغب في الإجابة عليه.</p> <p>سيتم الاحتفاظ بالبيانات التي تم جمعها بسرية تامة. ولن يقوم الباحث أو المشرف البحثي بجمع أي معلومات تعريفية مثل اسمك أو عنوان بريدك الإلكتروني. سيتم تخزين السجلات أو البيانات البحثية إلكترونياً فقط على جهاز كمبيوتر محمي بكلمة مرور، وسيتم إتلاف جميع البيانات بعد 5 سنوات من انتهاء من جمع البيانات.</p> <p>المشاركة في هذا لن تضيف أي فائدة إلى مكانتك الأكاديمية أو أدائك. لكنها ستساعدنا في تحديد دوافع وحواجز التبرع بالدم في قطر، مما سيساعدنا في تطوير استراتيجيات مستقبلية لزيادة عدد المتبرعين بالدم.</p> <p>سوف تستغرق مشاركتك ما بين 5-8 دقائق.</p> <p>- يتكون الاستبيان من خمسة أجزاء:</p> <p>الجزء أ: المعلومات الاجتماعية والديموغرافية وحالة التبرع بالدم (8 بنود)</p> <p>الجزء ب: المحفزات للتبرع بالدم (9 بنود) – للمتبرعين بالدم فقط</p> <p>الجزء ت: الحواجز التي تحول دون التبرع بالدم (11 بنود) - لغير المتبرعين بالدم فقط</p> <p>الجزء ث: تقييم المعرفة حول التبرع بالدم (8 بنود)</p> <p>الجزء ج: الترويج للتبرع بالدم (3 بنود)</p> <p>تمت الموافقة على الدراسة من قبل لجنة QU-IRB مع رقم الموافقة <b>QU-IRB 1268-EA/20</b> ويمكنكم الاتصال بهم على <a href="mailto:QU-IRB@qu.edu.qa">QU-IRB@qu.edu.qa</a> لأي توضيح يتعلق بالامتثال الأخلاقي لهذا البحث.</p> <p>إذا كان لديك أي أسئلة أخرى، يمكنك التواصل مع: <b>أمل إبراهيم (طالبة)</b> ماجستير في إدارة المختبرات الطبية الحيوية مع خيار المشروع في جامعة قطر الإيميل: <a href="mailto:amal.ibrahim@qu.edu.qa">amal.ibrahim@qu.edu.qa</a></p> <p>د. عطية عبد الله (المشرف البحثي) أستاذ مساعد في قسم العلوم الطبية الحيوية الإيميل: <a href="mailto:aabdallah@qu.edu.qa">aabdallah@qu.edu.qa</a> إذا كنت قد قرأت وفهمت ووافقت على المشاركة، فيرجى متابعة الاستبيان. الرابط: <a href="https://www.surveymonkey.com/r/Blood_Donation_QatarUniversity">https://www.surveymonkey.com/r/Blood_Donation_QatarUniversity</a></p>
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**Dr. Atiyeh Abdallah (Research Supervisor)**

Assistant Professor of Biomedical Sciences

Email: [aabdallah@qu.edu.qa](mailto:aabdallah@qu.edu.qa)

If you have read, understood and agree to participate, please proceed with the survey.

Thank you for your participation and support.

Please find the survey link below:

[https://www.surveymonkey.com/r/Blood\\_Donation\\_QatarUniversity](https://www.surveymonkey.com/r/Blood_Donation_QatarUniversity)

APPENDIX B: SURVEY SHARED BY QU ANNOUNCEMENTS TO ALL QU STUDENTS

**From:** SPD Surveys <[spd-surveys@qu.edu.qa](mailto:spd-surveys@qu.edu.qa)>

**Sent:** Tuesday, March 24, 2020 2:49:55 PM

**To:** SPD Surveys <[spd-surveys@qu.edu.qa](mailto:spd-surveys@qu.edu.qa)>

**Subject:** Invitation to participate in a survey about the willingness to donate blood among Qatar University students **ين طلاب جامعة قطر**

Dear student,

You are invited to participate in a research study that aims in assessing the knowledge level of blood donation, and identifying the motivators and barriers that affect the willingness to donate blood among young adults at Qatar University.

Participation in this study is voluntary. You have the right to withdraw from the study at any time, or skip any question(s) that they do not wish to answer.

Your responses will be completely confidential, and the researcher and/or supervisor will not collect any identifying information such as your name, email address or IP address. Research records or data will be stored electronically on a password protected computer, and all records will be destroyed after 5 years upon completion of collecting data.

Participating in this will not add any benefit to your academic standing or performance. However, it will help us identify the motivators and barriers of blood donation among young adults Qatar, which will help us in developing future strategies to recruit more blood donors.

The procedure involves filling an online questionnaire that will take approximately 5-8 minutes.

• The questionnaire consists of five parts:

Part A: Sociodemographic information and blood donation status (8 items)

Part B: Motivators to donate blood (9 items)- for donors only

Part C: Barriers to donate blood (11 items)- for non-donors only

Part D: Knowledge assessment (8 items)

Part E: Promoting blood donation (3 items)

عزيزي الطالب/الطالبة،

أنت مدعو للمشاركة في دراسة بحثية تهدف إلى تقييم مستوى المعرفة بالتبرع بالدم، وتحديد الدوافع والحواجز التي تؤثر على الرغبة في التبرع بالدم بين فئة الشباب في جامعة قطر.

المشاركة في هذه الدراسة اختيارية، لذلك الحق في الانسحاب من الدراسة البحثية في أي وقت، أو يمكنك تخضي أي سؤال (أسئلة) لا ترغب في الإجابة عليه.

سيتم الاحتفاظ بالبيانات التي تم جمعها بسرية تامة، وإن يقوم الباحث أو المشرف البحثي بجمع أي معلومات تعريفية مثل اسمك أو عنوان بريدك الإلكتروني. سيتم تخزين السجلات أو البيانات البحثية إلكترونياً فقط على جهاز كمبيوتر محمي بكلمة مرور، وسيتم إتلاف جميع البيانات بعد 5 سنوات من انتهاء من جمع البيانات.

المشاركة في هذا لن تضيف أي فائدة إلى معارفك الأكاديمية أو أدائك، لكنها ستساعدنا في تحديد دوافع وحواجز التبرع بالدم في قطر، مما سيساعدنا في تطوير استراتيجيات مستقبلية لزيادة عدد المتبرعين بالدم.

سوف تستغرق مشاركتك ما بين 5-8 دقائق.

- يتكون الاستبيان من خمسة أجزاء:

الجزء أ: المعلومات الاجتماعية والديموغرافية وحالة التبرع بالدم (8 بنود)

الجزء ب: الحواجز للتبرع بالدم (9 بنود) - للمتبرعين بالدم فقط

الجزء ت: الحواجز التي تحول دون التبرع بالدم (11 بنود) - لغير المتبرعين بالدم فقط

الجزء ث: تقييم المعرفة حول التبرع بالدم (8 بنود)

الجزء ج: الترويج للتبرع بالدم (3 بنود)

تمت الموافقة على الدراسة من قبل لجنة QU-IRB مع رقم الموافقة -QU-IRB 1268

EJA/20 ويمكنكم الاتصال بهم على

[QU-IRB@qu.edu.qa](mailto:QU-IRB@qu.edu.qa) لأي توضيح يتعلق بالامثال الأخلاقي لهذا البحث.

## APPENDIX C: QUESTIONNAIRE IN ENGLISH/ARABIC

### • Part A (sociodemographic and blood donation status):

الجزء أ: المعلومات الاجتماعية والديموغرافية وحالة التبرع بالدم (8 بنود)

#### 1. What is your age?

ما هو عمرك

- 18-19
- 20-21
- 22-23
- 24 or above أو أكثر

#### 2. Gender

الجنس

- Male ذكر
- Female أنثى

#### 3. Nationality

الجنسية

- Select nationality اختر جنسيتك

#### 4. Current academic year

العام الدراسي الحالي

- Freshman (Credit Hours < 29)  
طالب سنة أولى (الساعات المكتسبة >29)
- Sophomore (Credit Hours 30- 59)  
طالب سنة ثانية (الساعات المكتسبة 30-59)
- Junior (Credit Hours 60- 89)  
طالب سنة ثالثة (الساعات المكتسبة 60-89)
- Senior (Credit Hours > 90)  
طالب سنة رابعة (الساعات المكتسبة <90)
- Graduate student  
طالب دراسات عليا

#### 5. College

الكلية

- College of Arts and Science كلية الآداب والعلوم
- College of Business and Economics كلية الإدارة والاقتصاد
- College of Education كلية التربية
- College of Engineering كلية الهندسة
- College of Law كلية القانون
- College of Sharia and Islamic Studies كلية الشريعة والدراسات الإسلامية
- College of Health Sciences كلية العلوم الصحية
- College of Medicine كلية الطب
- College of Pharmacy كلية الصيدلة
- College of Dental Medicine كلية طب الأسنان

#### 6. Where did you hear about blood donation? Participants could provide more than one answer in this question.

أين سمعت عن التبرع بالدم؟ من ممكن اختيار أكثر من إجابة واحدة في هذا السؤال.

- Friends/relatives الأصدقاء / الأقارب
- Television /Radio /Newspaper التلفزيون/ الراديو/ جريدة الأخبار



- Social media وسائل التواصل الاجتماعي
- Awareness campaign at university حملة توعية بالجامعة
- Awareness campaign or advertisement at shopping mall حملة توعية أو إعلان في مجمع تجاري
- Educational lecture محاضرة تثقيفية
- I have never heard of blood donation لم أسمع بالتبرع بالدم من قبل
- Others, please specify الأخرى، يرجى تحديد ذلك

**7. Have you ever donated blood before?**

هل تبرعت بالدم من قبل؟

- Yes نعم
- No لا

**8. If yes, how many times in the last one year?**

إذا كانت الإجابة نعم، كم مرة قد تبرعت بالدم خلال العام الماضي؟

- Once مرة واحدة
- Twice مرتين
- Three to four times ثلاث إلى أربع مرات
- More than five times أكثر من خمس مرات

**• Part B (Motivators- only for blood donors):**

الجزء ب: المحفزات للتبرع بالدم (8 بنود) – الإجابة من قبل بالدم فقط

**9. What motivated you to donate blood?**

ما الذي دفعك أو حفزك للتبرع بالدم؟

	Strongly agree أوافق بشدة	Agree أوافق	Neither agree nor disagree لا أوافق ولا أرفض	Disagree أرفض	Strongly disagree أرفض بشدة
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a) Donating to help patients

التبرع لمساعدة المرضى

b) When someone I know is in need

عندما يكون شخص أعرفه في حاجة

c) Friends or family who are donors had influence on me

عائلتي أو أصدقائي المتبرعين بالدم كان لهم تأثير علي

d) Incentives for donation (free gifts, food, vacation)

مكافآت التبرع بالدم (هدايا مجانية، طعام، عطلة من العمل)

e) Free health check

فحص طبي مجاني

f) The place of blood donation center is convenient

مكان مركز التبرع بالدم مناسب

- g) Convenient working hours of blood donation center  
ساعات العمل في مركز التبرع بالدم مناسبة
- h) Having a blood mobile unit come to your place of work or other place  
وجود وحدة متنقلة للدم تأتي إلى مكان عملك أو أي مكان آخر

i) Other motivators, please specify? يرجى التحديد؟

• Part C (Barriers- **only for non- donors**):

الجزء ت: الحواجز التي تحول دون التبرع بالدم (9 بنود) – الإجابة من قبل غير المتبرعين بالدم فقط

10. What prevented you from donating blood?

ما الذي يمنعك من التبرع بالدم؟

Strongly agree أوافق بشدة	Agree أوافق	Neither agree nor disagree لا أوافق ولا أرفض	Disagree أرفض	Strongly disagree أرفض بشدة
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- a) I do not think there is a need to donate blood  
لا أعتقد هناك حاجة للتبرع بالدم
- b) I might get HIV or AIDS from giving blood  
قد أصاب بالإيدز أو فايروس نقص المناعة نتيجة التبرع بالدم
- c) No one ever asked me to give blood  
لم يطلب أحد مني التبرع بالدم
- d) Failing to meet the requirements (body weight, blood pressure, hemoglobin, etc.)  
الفشل في تلبية متطلبات التبرع بالدم (الوزن، ضغط الدم، مستوى الهيموغلوبين)
- e) Fear (needles, feeling dizzy, etc.)  
الخوف (الإبر، الشعور بالدوار، وما إلى ذلك)
- f) I do not have time to donate blood  
ليس لدي وقت للتبرع بالدم
- g) I do not know where to donate blood  
لا أعرف مكان التبرع بالدم

**h) Inconvenient hours for blood donations sites**

ساعات العمل في مركز التبرع بالدم غير مناسبة

**i) Inconvenient locations for blood donations sites**

مكان مركز التبرع بالدم غير مناسب

**j) Limitation of activities after donation**

الأنشطة التي يمكنني أن أقوم بها بعد التبرع بالدم محدودة

**k) Other barriers, please specify and write your feedback?**

حواجز أخرى، يرجى التحديد؟

• **Part D (knowledge assessment on blood donation):**

الجزء ث: تقييم المعرفة حول التبرع بالدم (8 بنود)

**1. Do you know your blood type?**

هل تعرف فصيلة دمك؟

- Yes نعم
- No لا

**2. Can a donor be infected by donating blood?**

هل يمكن للعدوى أن تنتقل للمتبرع بالدم؟

- Yes نعم
- No لا \*
- I do not know لا أعلم

**3. Will your blood be tested before transfusing it to other people?**

هل سيتم فحص دمك من الأمراض قبل نقله إلى أشخاص آخرين؟

- Yes نعم\*
- No لا
- I do not know لا أعلم

**4. When someone donates blood, does the blood volume return to normal level within 24–48 hours?**

عندما يتبرع شخص بالدم، هل تعود كمية الدم في جسمه إلى ما كان عليه خلال 24-48 ساعة؟

- Yes نعم\*
- No لا
- I do not know لا أعلم

**5. How long does the donation process take one the person enters the donation room?**

كم تستغرق عملية التبرع بالدم بمجرد دخول شخص إلى غرفة التبرع للمتبرع بالدم؟

- 20 min دقيقة 20\*
- 40 m to 1 hour 40 دقيقة إلى 1 ساعة
- More than 1 hour أكثر من ساعة
- I don't know لا أعلم

**6. In order to donate blood, should the donor be fasting?**

هل يجب على المتبرع بالدم أن يكون صائمًا؟

- Yes نعم
- No لا \*
- I do not know لا أعلم

**7. Can the following donate blood?**

هل من الممكن للأشخاص في الحالات التالية للتبرع بالدم؟

**a) a person who has diabetes or high blood pressure**

الشخص المصاب بداء السكري أو ارتفاع ضغط الدم؟

- Yes نعم
- No لا \*
- I do not know لا أعلم

**b) A person who has fever?**

الشخص الذي يعاني من الحمى؟

- Yes نعم
- No لا \*
- I do not know لا أعلم

**c) Pregnant woman**

المرأة الحامل

- Yes نعم
- No لا \*
- I do not know لا أعلم

**d) Breastfeeding woman**

المرأة المرضعة

- Yes نعم
- No لا \*
- I do not know لا أعلم

**e) Menstruating woman**

المرأة في فترة الحيض

- Yes نعم
- No لا \*
- I do not know لا أعلم

**8. Can blood be stored for more than 24 hours if not used immediately?**

هل يمكن تخزين الدم إذا لم يتم استخدامه مباشرة؟

- Yes نعم\*
- No لا
- I do not know لا أعلم

**• Part E (Promoting blood donation):**

الجزء ج: الترويج للتبرع بالدم (4 بنود)

**1. The most effective ways of promoting blood donation considered by all participants? Participants could provide more than one answer in this question.**

بنظرك ما هي الطرق الأكثر فعالية للترويج بالتبرع بالدم؟ من الممكن اختيار أكثر من إجابة واحدة في هذا السؤال.

- Raising the awareness of blood donation  
زيادة التوعية بالتبرع بالدم
- Increasing the values of incentives  
زيادة المكافآت
- Increasing blood donation sites  
زيادة مواقع التبرع بالدم
- Provide mobile blood donation system (i.e: truck)  
توفير نظام متنقل للتبرع بالدم (أي: شاحنة)
- Lengthening the operation hours  
إطالة ساعات العمل لمركز التبرع بالدم
- Recruit donors via social media  
اتواصل مع المتبرعين بالدم عبر وسائل التواصل الاجتماعي

- Develop a mobile technology that send reminders to blood-donors when needed  
تطوير تطبيق في الهاتف المحمول يقوم على ارسال رسائل تذكيرية إلى المتبرعين بالدم عند الحاجة
- Others, please specify**  
الأخرى، يرجى تحديد ذلك

**2. Do you think a mobile application can help in promoting in blood donation?**  
هل تعتقد أن تطبيق هاتف محمول خاص بالتبرع بالدم يمكن أن يساعد في الترويج للتبرع بالدم؟

- Strongly agree أوافق بشدة
- Agree أوافق
- Neither agree nor disagree لا أوافق ولا أرفض
- Disagree أرفض
- Strongly disagree أرفض بشدة

**3. If yes, what are the features that you believe are helpful in mobile application for blood donation? Participants could provide more than one answer in this question.**

ما هي الميزات التي تعتقد أنها مفيدة في تطبيقات الهاتف المحمول للتبرع بالدم؟

- View locations of the closest donation center or mobile unit  
عرض أقرب موقع مركز للتبرع بالدم أو محطة متنقلة
- Schedule appointments  
حجز موعد
- Request pickup to donate blood  
طلب خدمة توصيل إلى مركز التبرع بالدم
- Fill donor questionnaire before going to blood donation center to speed up the process  
ملئ استبيان التبرع بالدم قبل الذهاب إلى مركز التبرع بالدم لتسريع العملية
- Send notifications when there is a need for specific blood group that matches the donor

blood group.

ارسال إشعارات عندما تكون هناك حاجة إلى فصيلة دم معينة تتطابق مع فصيلة دمي

- Information on blood donation process  
معلومات عن عملية التبرع بالدم
- Others, please specify** الأخرى يرجى التحديد

## APPENDIX D: OTHER MOTIVATORS (OPEN-ENDED QUESTION)

#	OTHER MOTIVATORS, PLEASE SPECIFY? يرجى التحديد؟ دوافع أخرى،	DATE
1	Health benefits gained because of blood donation	3/25/2020 11:51 AM
2	Social media awareness of how much people need blood to survive (people don't realize that )	3/25/2020 10:54 AM
3	احتساب الأجر	3/25/2020 8:40 AM
4	تم نقل الدم لي عدة مرات ،فأردت رد الجميل	3/24/2020 8:11 PM
5	الإنسانية	3/24/2020 7:37 PM
6	خوض تجربة جديدة	3/18/2020 1:18 PM
7	Social Responsibility.	3/16/2020 1:20 PM
8	اتمنى لو كان بكل مركز صحي وحدة تبرع دم افضل من الذهاب لمكان بعيد	3/8/2020 10:17 PM

## APPENDIX E: OTHER BARRIERS (OPEN-ENDED QUESTION)

#	OTHER BARRIERS, PLEASE SPECIFY? حواجز أخرى، يرجى التحديد؟	DATE
1	أعاني من فقر الدم	3/27/2020 7:34 PM
2	Fear of getting infections during the process	3/26/2020 11:00 AM
3	يعتقد والداي أنه سيضرني مع محاولاتي في إفناءهما	3/25/2020 7:41 PM
4	روكبان كورس	3/25/2020 6:35 PM
5	بعد سماع شكاوي أصدقاء متبرعين بالدم حول عدم كفاءة بعض الممرضات في وخز الأبرر و نسبهم بالألم تكون حاجز يمنعني من الإقدام على الأمر خصوصاً و أن عملية السحب تستغرق وقت طويل	3/25/2020 4:23 PM
6	A small phobia of injections	3/25/2020 12:49 PM
7	فقر الدم	3/25/2020 12:39 PM
8	الوالده نوسوس تحسب بيصيدي كوفيد-١٩	3/25/2020 12:28 PM
9	بجانب الوقت، عندما رغبت بالتبرع بالدم في الجامعة أصبح هناك اكتفاء	3/25/2020 12:01 PM
10	لم أكن قد أنممت ١٨ سنة	3/25/2020 11:40 AM
11	نقص الحديد والهيموجلوبين في الدم	3/25/2020 11:36 AM
12	My blood type is AB+, which is not usually needed for donation because it can only be given to AB+ people who can literally accept any other blood type.	3/25/2020 11:35 AM
13	Whenever we have blood donation drives in University it gets really crowded so have to wait a lot and sometimes I don't have that much time between classes. Moreover, my blood group is B+ and usually they require more of the rhesus negative groups or the O blood group for donations.	3/25/2020 11:25 AM
14	عدم رضا الوالدين	3/25/2020 10:50 AM
15	Transportation and going to hospital,	3/25/2020 10:46 AM
16	فقر دم حاد منا يعيقني من تقديم المساعدة للآخرين	3/25/2020 10:45 AM
17	the blood donation site in university closed before I could donate because it was full	3/25/2020 10:33 AM
18	رفض الوالده	3/25/2020 10:27 AM
19	ليس لدي من يوصلني الي مراكز التبرع بالدم	3/25/2020 9:58 AM
20	عدم وجود الدافع و الرغبة الشديدة	3/25/2020 9:57 AM
21	نظافة الادوات المستخدمة في سحب الدم	3/25/2020 9:55 AM
22	When blood donors come to QU, it's too crowded and I do not get treated because I am either just before, have just finished, or is on my period, even though I insist I have good hemoglobin levels (13.4).	3/25/2020 9:50 AM
23	نقص الحديد الحاد، لا يمكنني التبرع لقله الدم	3/25/2020 9:48 AM
24	i dont have the best experiences when only taking blood sample for tests, so I imagine it will be worse if i get larger amounts taken. I really want to but I cant	3/25/2020 9:42 AM
25	I hope to donate but I have anemia	3/25/2020 9:38 AM
26	مصابة بفقر دم ونسبة مخزون الدم لدي قليل	3/25/2020 9:05 AM
27	لم أستطع التبرع بالدم بسبب قلة وزني	3/25/2020 8:53 AM
28	التدخين	3/25/2020 8:31 AM
29	لا أعرف المكان والوقت والشروط	3/25/2020 8:30 AM
30	حالتى الصحية غير مستقرة فى العام الاخير	3/24/2020 3:17 PM

#	الأخرى، يرجى التحديد (OTHER (PLEASE SPECIFY))	DATE
1	احضار المشاحات وبقاءها لاكثر من يوم حيث انها افتصرت على يوم للتبرع للبنات ويوم للاولاد	3/25/2020 1:00 PM
2	Showing cases of people who need blood donation	3/25/2020 12:51 PM
3	by appointment, instead of waiting in queue	3/25/2020 11:01 AM
4	Home services	3/25/2020 10:49 AM
5	ممكن عن طريق الاعلانات , او عن طريق مشاهير السوشيال ميدي	3/25/2020 10:02 AM
6	there are facts i dont know about the nature of donation, i dont think i'm the only one, so you can do a tv ad that does like (myth/fact) for encouraging others	3/25/2020 9:59 AM
7	جعل أكياس مخصصة للأطفال بحيث يكون وزهم أقل من خمسين فادرن على التبرع	3/25/2020 9:54 AM
8	مؤثرين التواصل الاجتماعي من الممكن ان يؤثرون كما قامت فوفا ريم وجذبت العديد من الاشخاص	3/25/2020 9:51 AM
9	توضيح الفئات المحتاجه للتبرع بذلك يزيد التعاطف والسعي للتبرع بالدم	3/24/2020 3:28 PM
10	رسائل نصيه	3/24/2020 3:22 PM
11	شخصياً لأرشد التبرع بالدم	3/24/2020 3:15 PM
12	كل أسبوع يكون في مكان من الامكان العامه شاحته للتبرع بالدم	3/24/2020 2:43 PM
13	أخذ كميات دم أقل من الناس الي يترددون في التبرع	3/16/2020 2:03 PM
14	Maybe there should be a way to make the fear go from people so they can donate. if i don't have a fear i would have donated many times as my blood fits most of the types.	3/16/2020 12:29 PM
15	ارسال رساله للمتبرع في حال تم استخدام دمه هذا بشجع على الاجاز والتبرع أكثر لمعرفة المتبرع ان مايقوم به له تأثير حقيقي في العلاج الحالات	3/16/2020 12:27 PM
16	نشر فوائد التبرع	3/15/2020 8:38 PM
17	توعية طلاب المدارس منذ الصغر	3/9/2020 11:46 AM
18	اعطاء بطافه للمتبرع .. و اعطاءه بعض المميزات في المحلات التجاربه و المجتمع عامه	3/8/2020 10:47 PM
19	تمديد وقت نأفلات نقل الدم لطوال اليوم بدل فترة صباحيه	3/8/2020 10:22 PM
20	وسائل الاعلام وتنقيف للمجتمع	3/8/2020 8:58 PM
21	توعيه المتبرعين بعدد المرات التي يمكن التبرع بها بالسنه	3/8/2020 8:15 PM



APPENDIX F: OTHER WAYS OF PROMOTION (OPEN-ENDED QUESTION)

31	لاني أخاف من الابري@مع انه صحتي ممثاره	3/24/2020 3:10 PM
32	الخوف من أن يكون دمي غير صحي أو مضر	3/16/2020 9:52 PM
33	عدم تشجيع الاهل	3/16/2020 4:29 PM

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	Knowledge level, motivators and barriers of blood donation among young adults at Qatar University: a cross-sectional survey	SurveyMonkey
34	ما عمري فكرت احس دمي ما يصلح ما عرف لانه عندي نقص فيتا مينات	3/16/2020 2:18 PM
35	جنسيتي بريطانية، فالو لأمي توفت تحي لانه جوازها بريطاني، خايفين من مرض جنون البقر	3/16/2020 1:59 PM
36	الحالة الصحية	3/16/2020 12:55 PM
37	Big Fear	3/16/2020 12:19 PM
38	خوف الاهل	3/16/2020 12:07 PM
39	بأخذ وقتاً	3/16/2020 11:57 AM
40	عدم معرفة مكان التبرع والوقت وكل ذلك	3/15/2020 8:46 PM
41	حجم الوريد	3/9/2020 10:29 PM
42	Generally fear of illness	3/9/2020 8:05 PM
43	خوف الأهل علي، لأنني بنظرهم ضعيفة وجسمي وقدراتي غير قابلة للتبرع	3/9/2020 12:13 PM
44	My family refuse	3/9/2020 7:13 AM
45	لدي فقر دم، كذلك كنت أسمع بأن المرأة لا تحتاج للتبرع بالدم بقدر الرجل كونها تفقد الدم خلال الدورة ! الشهرية وأثناء الولادة	3/8/2020 11:58 PM
46	عدم تشجيع الاسرة على التبرع بالدم	3/8/2020 10:59 PM
47	لدي تلاسيميا بيتا في كرات الدم الحمراء ، لهذا لا يمكنني التبرع بالدم	3/8/2020 10:41 PM
48	Piercing regulation in HMC, need to be more than a year after a piercing	3/8/2020 8:55 PM
49	الخوف من نقص الهيموجلبين لأنني من الأشخاص المصابين بالأنيميا كذلك	3/8/2020 8:55 PM
50	عروقي ضعيفه، فالولي ما يصير	3/8/2020 8:20 PM
51	I have Asthma, they told me I cannot donate	3/8/2020 8:08 PM
52	I tried to donate one time but they say that my veins are too small for the needle and now my hemoglobin is a bit low but I'm trying to eat healthy so by the end of the year I can donate	3/8/2020 8:02 PM
53	أعتقد أن هناك شروط معينة للتبرع وليست اعلم إذا كنت مناسبة ام لا	3/8/2020 7:55 PM
54	لأنني أنثى	3/8/2020 7:40 PM
55	Lack of awareness	3/8/2020 6:57 PM

## APPENDIX G: OTHER MOBILE APP FEATURES (OPEN-ENDED QUESTION)

#	أخرى، الرجاء التحديد (PLEASE SPECIFY) OTHER	DATE
1	inform the person if he is fit to donate or not before going to site.	3/25/2020 11:55 AM
2	عند استخدام دم المتبرع لأي شخص إرسال رسالة له تجعله يشعر أنه ساعد بانقاذ شخص ما	3/25/2020 9:57 AM
3	Showing where mobile blood donation trucks are	3/25/2020 9:06 AM
4	الحضور إلى منزل المتبرع لأخذ الدم عن طريق شاحنات متنقلة	3/24/2020 4:55 PM
5	أن تقوم سياره التبرع بزياره الموقع المتواجد فيه الشخص الذي يرغب بالتبرع في ظل الوضع الحالي او أن يقوم بتجميع ثلثه الى عشره أشخاص واستدعاء سياره التبرع بالدم	3/24/2020 3:28 PM
6	توضح الحالات المحتاجة للتبرع بالدم دون ذكر أسماء. الأمر الذي يمكن للمتبرع من التبرع لحالة بعينها ويشجعه نظراً لارتباطه العاطفي مع الحالات	3/24/2020 3:06 PM
7	أن يظهر على اشعار بمكنى المعرفة من خلاله متى بمكنى التبرع مرة اخرى	3/19/2020 2:31 AM
8	ذكر فوائد التبرع بالدم على مستوى الفرد والمجتمع من ناحية الصحة	3/16/2020 2:03 PM
9	توضح كم كيس دم يتم التبرع به خلال اليوم الواحد وكم استخدمو منه للتخفيف	3/16/2020 12:53 PM
10	..	3/16/2020 12:35 PM
11	Registering to the app should be with phone number, so if anyone deletes the app, they can get sms when blood needed.	3/16/2020 12:29 PM
12	اسماء الدكاتره المتاحين والكميه المطلوبه منى التبرع بها حسب العمر	3/16/2020 12:27 PM
13	وجود كتره للبرامج لا يعنى أهميتها وحتى اننى قد ألغيت التنبيهات وفي فطر الوصول للموقع لا يحتاج إلى برنامج خاص لصغر دولتنا	3/16/2020 3:27 AM
14	Provide why the blood is needed to signify the importance of it.	3/8/2020 10:26 PM
15	توفير شاحنه متنقله لتبرع في الدم	3/8/2020 10:16 PM
16	Assessment of the donors blood information	3/8/2020 9:51 PM
17	تذكير بإمكانية التبرع بعد عملية التبرع السابقه	3/8/2020 8:15 PM
18	Provide clear information about the health requirements for donation (specially for females: the timing according to the menstrual period).	3/8/2020 7:57 PM