

Voluntary blood donation among female health care university students in Saudi Arabia, knowledge and status

Shaddin A. Alaskar^{1,2}, Jumanah A. Alsadhan^{1,2}, Rawan M. Alanazi^{1,2},
Lama S. Alnashi^{1,2}, Razan K. Almutairi^{1,2}, Yusra S. Chachar^{1,2},
Moussab Damlaj^{2,3}

¹King Saud bin Abdulaziz University for Health Science, ²King Abdulaziz Medical City, Ministry of National Guard Health Affairs, ³King Abdullah International Medical Research Center, Ministry of National Guard-Health Affairs, Riyadh, Saudi Arabia

ABSTRACT

Context: Blood donation is an essential lifesaving procedure. There is a continuous effort to supply the high demand in hospitals. **Aims:** To assess the current status, knowledge, and attitudes of female health care students in King Saud Bin Abdulaziz University for Health Sciences (KSAU-HS) regarding blood donation. **Settings and Design:** A cross-sectional study was done with students in the female campus of KSAU-HS in Riyadh. **Methods and Material:** The sample was categorized based on the college and year of study. A self-administered questionnaire was distributed during the first semester of the 2018–2019 academic year to an estimated 20%–25% of students per batch. **Statistical analysis used:** Statistical Package for Social Sciences version 22 (SPSS Inc., Chicago, IL). **Results:** A total of 302 students completed the questionnaire with a median age of 21 years and a range of 18–30 years. Only 14.6% of the sample previously donated blood, with half of this group donating more than once. Just less than half (48.7%, n = 147) have been exposed previously to a university campaign related to blood donation. The majority (74.5%, n = 225) knew their blood type, small proportions (16.6%, n = 50) and (10.9%, n = 33) reported knowing family members or friends requiring blood products. More than half (57.6%) of the students admitted not having sufficient knowledge regarding blood donation, and the majority (75.1%) were not aware of the quantity of blood collected during a donation. Two-thirds, 31.4% and 32.1% agree and strongly agree, respectively, that blood donation is a duty that every individual should perform. Just more than half (53%) of the students strongly agreed that they are motivated to donate blood on moral or religious grounds. **Conclusion:** The proportion of prior blood donation in the sample was low. This is due, in part, to inadequate knowledge about the donation process. Given that many students felt motivated to donate, it is possible that raising awareness through educational interventions could increase donations in female health care students.

Keywords: Attitude, blood donation, female students, health care students, knowledge, Saudi Arabia, university students

Introduction

Blood donation is an important, lifesaving procedure in which blood is collected, grouped, and made accessible to patients requiring a blood transfusion. Voluntary and regular donations are essential to supply hospitals with sufficient blood in all

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Alaskar SA, Alsadhan JA, Alanazi RM, Alnashi LS, Almutairi RK, Chachar YS, *et al.* Voluntary blood donation among female health care university students in Saudi Arabia, knowledge and status. *J Family Med Prim Care* 2021;10:2353-7.

Address for correspondence: Dr. Shaddin A. Alaskar,
P.O. Box: 56296, Riyadh 11554, Saudi Arabia.
E-mail: Shaddin98@gmail.com

Received: 22-10-2020

Revised: 24-12-2020

Accepted: 12-01-2021

Published: 02-07-2021

Access this article online

Quick Response Code:



Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_2182_20

the blood groups.^[1] The donated blood could be used in surgical interventions, trauma, hematological disorders, and pregnancy-related complications.^[2] The blood banks in the Kingdom of Saudi Arabia are responsible for recruiting donors, testing for infective agents, preparation, and storage. The usual quantity collected is approximately 450 to 500 mL.^[3] Tests to determine the ABO and Rh blood group, and screening the serum for antibodies, are required before the transfusion. Careful and safe donor selection and microbiological tests aim to protect both the donor and the recipient.^[4] Since 1981, Saudi Arabian blood banks used locally donated blood instead of imported blood. However, the number of donors is still not sufficient to meet the increasing demand.^[5]

Several studies have been conducted globally to assess the attitudes of the youth regarding blood donation. A cross-sectional study was conducted in Kilimanjaro, Tanzania with 422 university students to gain insight into the knowledge and awareness of blood donation in the young population. The study concluded that 70% of the participants have never donated, and 36% did not donate due to a lack of knowledge about blood donation.^[6] A study conducted in Bhubaneswar, India, with 399 students from five different colleges, concluded that 43.4% donated blood due to a sense of social responsibility. The majority (75%) of the students were from nonmedical specialties and 85% indicated that they would encourage people to donate blood. More than half (56.4%) were afraid of a temporary weakness after donating, and 26% were concerned about their health. Globally, 80% of regular blood donors, stopped donating.^[7] Education is a major element in blood donation.^[5] Studies done in Thailand, Nigeria, and Tanzania reported an association between the act of voluntary blood donation and secondary school education.^[8]

In 2011, a study was conducted with the male students of King Khalid University Hospital and King Saud University Health Center. The study indicated that though the majority of the students were actually aware of the importance of blood donation, they declined to donate.^[5] In 2014, a study was conducted in the Central Province of Saudi Arabia, which reported that the prevalence of blood donation was much lower than expected. They ascribed the low prevalence to misconceptions and poor knowledge. The study also highlighted a difference between males and females in terms of blood donation. Males donated more and had a more positive attitude toward blood donation compared with females.^[8] The proportion of Saudi females donating blood is less than 5% of the donors. A study conducted in King Saud University involving different departments such as Art, Science, and Business Administration indicated that many of the participants were not aware of the low percentage of the donation, though they were informed about the increasing demand confronting the blood banks. Most of the participants were willing to donate blood if the process of collecting blood was available in places where people gathered such as a shopping mall or simply at their own college.^[9]

Young adults are the most favorable and targeted category when it comes to donating blood.^[1] The aim of this cross-sectional survey which was conducted in King Saud Bin Abdulaziz University (KSAU) to assess the status and knowledge of female health care students towards donating blood. The study intended to understand the attitudes of students and the current limitations and barriers that prevent female health care students from taking part when it came to blood donation. Furthermore, this could facilitate forming appropriate interventions which lead to more awareness among such groups all in favor of increasing blood donation.

Subjects and Methods

Study design and setting

The study was conducted in the female campus of KSAU-HS in Riyadh, Saudi Arabia. KSAU-HS comprises different colleges including College of Medicine, College of Dentistry, College of Pharmacy, College of Applied Medical Sciences (AMS), and College of Nursing. A cross-sectional study was conducted to assess the degree of awareness of female health care students regarding blood donation as well as the factors that might influence the students' attitude regarding this procedure.

Identification of study participants

The sample, female students of KSAU-HS, was categorized based on the college and the year of study, the batch. All the female health care students from all batches in KSAU-HS were targeted and included in the study. The total population was 1,456. All students not willing to participate were excluded. After calculating the sample size with a margin of error of 5%, a confidence level of 95%, a population of 1456, and an expected prevalence of 50%, the recommended sample size was 302. A nonrandom quota sampling technique was chosen, which allowed students from each college and batch to have an equal chance of participation.

Data collection process

The data were collected with a self-administered questionnaire during the first semester of the 2018–2019 academic year. The content validity of the questionnaire was ensured by thoroughly searching relevant literature and consulting with MD, a relevant subject expert. The clarity of the questions was tested and ensured with a pretest where 20 random students were asked to fill out the questionnaire and provide us with their feedback. The 302 questionnaires were divided between data collectors, and the batch leaders were contacted to disseminate the questionnaire to the students from each batch. The process was voluntary, and there was no coercion or compensation involved. Institutional Review Board approval was obtained before commencing the study. The ethical approval was obtained on July 18, 2018. Confidentiality and anonymity were maintained throughout the study, and no name or personal information was required. Only the research team had access to the data during the study, and a copy of the consent form was attached to the questionnaire to be reviewed by each participant.

Data analysis

The data were analyzed using the Statistical Package for Social Sciences version 22 (SPSS Inc., Chicago, IL). Frequency and percentage were used to describe categorical variables. A Chi-square test was used to assess the association between the demographic variables, knowledge, and status of blood donation. Fisher's exact test was used when more than 20% of cells had an expected count <5 or any of the cells had an expected count <1. A *P* value <0.05 was considered significant.

Results

Demographics and donation status

Of the 302 participants, 27.8% (n = 84) were medical students, 12.9% (n = 12) dental students, 19.5% (n = 59) pharmacy students, 19.9% (n = 60) nursing students, and 19.9% (n = 60) were in AMS. The age ranged from 18 to 30 years with a median age of 21 years. Regarding ever donating blood, only a small proportion (14.6%, n = 44) responded yes. Of this group, 29.5% (n = 13) were from the College of Medicine, 29.5% (n = 13) from AMS, 15.9% (n = 7) from pharmacy, 15.9% (n = 7) were dental students, and the remaining 9.1% (n = 4) were nursing students. Additional characteristics regarding blood donation is available in Table 1.

Knowledge and attitude regarding donation

Most of the sample knew their blood type (74.5%), the universal blood recipient (82.7%), and the universal blood donor (91%). Only 16.6% (n = 50) students knew a family member who needed blood transfusions, and 10.9% (n = 33) knew a friend who needed blood transfusions. In terms of the age at which a person could start donating blood, 61% (n = 184) did not know and 59.6% (n = 180) did not know the waiting period between donations. The majority (75.1%, n = 227) did not know the quantity of blood that is collected per procedure. More than half (57.6%, n = 174), of the sample, consider themselves not knowledgeable enough regarding blood donation. Additional information is available in Table 2.

More than half (53.9%, n = 163), indicated that a person with an influenza virus infection cannot donate blood due to the risk of transfer, and the majority (91.1%, n = 275) indicated

that a person with a sexually-transmitted disease cannot donate blood. Almost all (95.3%, n = 286) knew that a person with iron-deficiency anemia cannot donate blood. In terms of a person with a chronic illness such as hypertension or diabetes, more than half (56.5%, n = 178) believed that blood donation is permitted, and 76.5% (n = 231) agreed that a person with leukemia or lymphoma can never donate blood, even after recovery [Tables 3 and 4].

Attitude towards donation

In terms of considering blood donation as a duty of each eligible individual, a third (32.1%, n = 97), chose "Strongly agree", 31.4% (n = 95) "Agree", 24.5% (n = 74) "Neutral", 8.9% (n = 27) "Disagree", and 3% (n = 9) chose "Strongly disagree" (*P* = 0.058). Further information is available in Table 5.

Knowledge of donors vs. non-donors

Regarding their blood type, a small proportion (9.1%, n = 4) of the donor group compared to 28.3% (n = 73) (*P* = 0.015) of the nondonor group did not know their blood type. Most of the donor group (63.9%, n = 28) compared to the nondonor group (35.7%, n = 91) knew the waiting period between each donation (*P* = 0.002). Similarly, more in the donor group (43.2%, n = 19) compared to the non-donor group (21.1%, n = 54) knew the quantity of blood collected per procedure (*P* = 0.006). More than half, (59.5%, n = 25), of the donor group and 42.4% (n = 106) of the nondonor group believed that they are likely to donate whole blood than apheresis. Almost half (45.5%, n = 20) of the donor group knew that a person can donate blood during menstruation, compared with 19.8% (n = 51) of the nondonor group (*P* = 0.001). There were no other significant associations between the blood donation status and knowledge of blood donation. In addition, the type of college and college year showed no association with the level of knowledge.

Discussion

The results highlight a low prevalence of blood donors (14.6%) in the female students at KSAU-HS. A similar study was conducted with health science students in Gondar University, Ethiopia and of 255 students, only 12.5% were donating.^[10] Our results are consistent with a recent study in Jeddah, Saudi Arabia. The authors reported that 30.1% of 598 health care students donated blood previously, and 40.1% of the male students were donors compared with 16.5% of the female students.^[11] Another study in Saudi Arabia also reported that the act of donation among males was much more prevalent than among females.^[8] Similar results were found in a medical college in North India.^[12] A study done in southwestern Spain stated that women are generally more altruistic which makes them more motivated to donate. However, the findings of the study indicated that more males than females donated blood. A possible reason proposed was barriers reducing the number of women donating, such as low hemoglobin levels and pregnancy.^[13] Literature also reports that women are more prone to vasovagal reactions.^[14,15] Kamel *et al.* reported a 0.41%

Table 1: Blood donation characteristics

Characteristic	N = 302
Previously Donated Blood, n (%)	
Yes	44 (14.6)
No	258 (85.4)
If Previously Donated How Many Times, n(%)	
1 time	24 (54.5)
1-5 times	12 (27.3)
5-10 times	4 (9.1)
Unsure	4 (9.1)
Last Time to Donate, n(%)	
1 month	4 (9.1)
6 months	10 (22.7)
12 months	7 (15.9)
>12 months	14 (31.8)
Unsure	9 (20.5)
Have You Seen Any University Campaigns, n (%)	
Yes	147 (48.7)
No	132 (43.7)
N/A	23 (7.6)

Table 2: Thoughts of students regarding donation

Do You Think	Yes	No	N/A	P-value
Your Family Members Are Against Blood Donation?, n (%)	44 (14.6)	256 (84.4)	2 (0.6)	1.000
There is a Lower Age Limit for Blood donation?, n (%)	180 (59.8)	120 (39.9)	1 (0.3)	0.410
There is a Lower Weight Limit for Blood Donation?, n (%)	262 (86.8)	38 (12.6)	2 (0.6)	0.233
Blood Donation Affects Menstruation?, n (%)	102 (33.8)	197 (65.2)	3 (1)	0.308
Blood Donation is Dangerous?, n (%)	36 (11.9)	262 (86.8)	4 (1.3)	1.000
More Likely to Donate Whole Blood Than Apheresis?, n (%)	131 (43.4)	161 (53.3)	10 (3.3)	0.068
Blood Donation is a Risky Procedure?, n (%)	47 (15.6)	254 (84.1)	1 (0.3)	1.000

Table 3: Knowledge regarding Blood Donation

Can a Person	Yes	No	I Don't Know	p-value
Donate Blood During Their Menstrual Cycle?, n (%)	71 (23.5)	124 (41.1)	107 (35.4)	0.001
Donate Blood While Pregnant?, n (%)	39 (12.9)	178 (58.9)	85 (28.1)	0.198
Donate Blood When They Have an Infectious Disease?, n (%)	11 (3.7)	263 (87.4)	27 (9)	0.931
Donate Blood if They Had an Organ Transplant?, n (%)	52 (17.3)	169 (56.1)	80 (26.6)	0.675
Donate Blood if They are Using Clotting Factor Concentrates?, n (%)	19 (6.4)	198 (66.2)	82 (27.4)	0.275
Donate if They are Taking Chronic Medications?, n (%)	95 (31.5)	115 (38)	92 (30.5)	0.416
Donate Blood if They are Males Who Have Had Sexual Contact with Other Males?, n (%)	56 (18.5)	144 (47.7)	102 (33.8)	0.495
Donate Blood if They Have Used Needles to Inject Drugs?, n (%)	22 (7.3)	213 (70.5)	67 (22.2)	0.823
Donate Blood if They're Being Treated for Cancer?, n (%)	26 (8.6)	202 (66.9)	73 (24.2)	0.680

Table 4: Knowledge regarding when to donate

When Can a Person Donate Their Blood	6 months	12 months	Anytime	Never	I Don't Know	p-value
After Getting a Piercing?, n (%)	47 (15.6)	24 (7.9)	65 (21.5)	6 (2)	160 (53)	0.148
After Getting a Tattoo?, n (%)	22 (7.3)	26 (8.6)	27 (8.9)	56 (18.5)	171 (56.6)	0.218
After Getting an Organ Transplant?, n (%)	9 (3)	36 (11.9)	5 (1.7)	56 (18.5)	196 (64.9)	0.097

Table 5: Attitude towards donating

Do you Think That	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	p-value
By Donating, You Encourage Others to Donate?, n (%)	159 (52.6)	120 (39.7)	20 (6.6)	0	3 (1)	0.958
Morally or Religiously, You are Motivated to Donate Blood?, n (%)	160 (53)	90 (29.8)	46 (15.2)	4 (1.3)	2 (0.6)	0.802
The Act of Blood Donation Would Increase if It is Compensated?, n (%)	77 (25.4)	104 (34.4)	105 (34.8)	13 (4.3)	3 (1)	0.480

incidence of moderate to severe vasovagal reactions in 800,000 donations by women, translating to 75% of the cases which have a negative effect on female blood donation.^[13-15]

In the current study, the majority of the students were knowledgeable about their blood type, the universal donor, and the universal recipient. As expected, donors had a higher level of knowledge than nondonors in terms of the donation process, as 42.2% knew the quantity collected per procedure, 84.8% the waiting period between donations, and 91.1% knew their blood type. The findings suggest that more knowledge is gained through experience. The Central Saudi Arabian study supports the statement that donors are more knowledgeable as well as the Dubey *et al.* study, with a similar report.^[8,16] The Central Saudi Arabian study suggests that the more knowledgeable a person is of the donation process, the more likely they are to donate.^[8]

More donors (45.5%) than nondonors considered that they could donate during menstruation. A study from Tanzania concluded that the lower prevalence of donation for women might be due to an erroneous belief that their hemoglobin levels are too low to donate blood due to their menstrual cycle.^[6] In the current study, 43.4% of the nondonor group had the same impression,

36.8% did not know, resulting in a small proportion (19.8%) who agreed that they can donate during menstruation. The study from Tanzania deduced that there is a need to explore the setting and to know why females are donating less than males.^[6]

More than half (57.6%, n = 174) of the female students did not consider themselves as being knowledgeable about blood donation. This may suggest the requirement to improve their confidence through educational interventions. It is noteworthy that in the current study, almost half of the students have not been exposed to an awareness campaign at the university.

Surprisingly, only 27.3% of the donors in our study knew a family member who needed blood transfusions. In a study conducted with health care professionals at the University of Gondar Hospital in Ethiopia, having a family member in need of blood transfusions was a significant factor associated with donation, they were 5 times more likely to donate.^[17] This could be understood that most of the donors in the current study donated blood due to altruism. The majority of the sample considered blood donation as a duty of each individual. This sentiment is supported by a study in Bhubaneswar, India, where the students donated blood due to a sense of social responsibility.^[7] The majority also felt morally or religiously motivated to donate, similarly to the study done in Jeddah.^[11] However, in contrast to the Jeddah study, the majority of the current sample strongly agree (25.4%, n = 77) and agree (34.4%, n = 104) that financial compensation would be a good motivator to encourage people to donate. The current sample of the student also agreed that they could encourage their peers by donating, similar to the

majority of the Bhubaneswar City study.^[7] A Nigerian study also revealed a similar attitude, with the main reason supporting blood donations was to save lives. The same motivation has been reported globally, confirming the willingness of individuals to be a part of saving someone's life.^[18]

This study has some limitations. The sample consisted of only females, and the comparison between males and females was obtained from the literature. Our population in this study is not necessarily representative of all the female health care students as the study was done in a single center. However, blood donation still remains low within the female population; hence, this study was aimed to assess the donation status among the female students in the university. In previous studies across cultures, this issue of lower female donors was related to misconceptions and lack of knowledge, indicating that there is a necessity to increase awareness and correct information. Moreover, it is a shared responsibility between health care personnel, particularly front-line health care workers such as primary health care physicians, to educate, raise awareness, and guide the students and community at large to donate.

Conclusion

To conclude, we report that the experience of blood donation enhances the donor's knowledge. The majority of the students were motivated to donate, and raising awareness through educational interventions is required at the university to increase the donations from female health care students.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

- Karim MR, Alam M, Farazi MMR, Labone RJ. Factors influencing blood donation behavior of university level students in Bangladesh. *J Inf Technol* 2012;1:35-40.
- Blood safety and availability [Internet]. Who.int 2019 [cited 6 September 2019]. Available from: <https://www.who.int/en/news-room/fact-sheets/detail/blood-safety-and-availability>.
- Laposata M. *Laboratory Medicine: The Diagnosis of Disease in the Clinical Laboratory*. 2nd ed. New York: McGraw Hill Education; 2014.
- Mehta AB, Hoffbrand AV. *Haematology at a Glance*. 4th ed. 2014.
- Abdel Gader AGM, Osman AMA, Al Gahtani FH, Farghali MN, Ramadan AH, Al-Momen AKM. Attitude to blood donation in Saudi Arabia. *Asian J Transfus Sci* 2011;5:121-6.
- Elias E, Mauka W, Philemon RN, Damian DJ, Mahande MJ, Msuya SE. Knowledge, attitudes, practices, and factors associated with voluntary blood donation among university students in Kilimanjaro, Tanzania. *J Blood Transfus* 2016;2016:8546803.
- Raghuwanshi B, Pehlajani NK, Sinha MK. Voluntary blood donation among students-A cross-sectional study on knowledge and practice vs. attitude. *J Clin Diagn Res* 2016;10:EC18-22.
- Abolfotouh M, Al-Assiri M, Al Askar A, AL-Johar A, AL-Omani M, AL-Hakbani A. Public awareness of blood donation in Central Saudi Arabia. *Int J Gen Med* 2014;7:401-10.
- Al-Johar A, Al-Saud A, Abalkhail Y, Jawdat T, Al-Khamees S, Al-Thunayan F, *et al.* Why do Saudi Women refrain donating their blood?- A study on the attitude, belief and motivation of Saudi female university students towards blood donation. *Clin Lab* 2016;62:771-9.
- Melku M, Asrie F, Shiferaw E, Woldu B, Yihunew Y, Asmelash D, *et al.* Knowledge, attitude and practice regarding blood donation among graduating undergraduate health science students at the University of Gondar, Northwest Ethiopia. *Ethiop J Health Sci* 2018;28:571-82.
- Alsalmi MA, Almalki HM, Alghamdi AA, Aljasir BA. Knowledge, attitude and practice of blood donation among health professions students in Saudi Arabia; A cross-sectional study. *J Family Med Prim Care* 2019;8:2322-7.
- Chauhan R, Kumar R, Thakur S. A study to assess the knowledge, attitude, and practices about blood donation among medical students of a medical college in North India. *J Family Med Prim Care* 2018;7:693-7.
- Prados Madrona D, Fernández Herrera MD, Prados Jiménez D, Gómez Giraldo S, Robles Campos R. Women as whole blood donors: Offers, donations and deferrals in the province of Huelva, south-western Spain. *Blood Transfus* 2014;12(Suppl 1):S11-20.
- Kamel H, Tomasulo P, Bravo M, Wiltbank T, Cusick R, James RC, *et al.* Delayed adverse reactions to blood donation. *Transfusion* 2010;50:556-65.
- Newman BH. Vasovagal reactions in high school students: Findings relative to race, risk factor synergism, female sex, and non-high school participants. *Transfusion* 2002;42:1557-60.
- Dubey A, Sonker A, Chaurasia R, Chaudhary R. Knowledge, attitude and beliefs of people in North India regarding blood donation. *Blood Transfus* 2014;12(Suppl 1):21-7.
- Arage G, Ibrahim S, Adimasu E. Blood donation practice and its associated factors among health professionals of University of Gondar Hospital, Northwest Ethiopia: A cross sectional study. *BMC Res Notes* 2017;10:294.
- Ugwu NI, Ugwu CN, Oti WJO, Uneke CJ. Pattern of blood donation practices among students of a Nigerian University. *Int Blood Res Rev* 2019;26:1-8.