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

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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
the blood groups.[3] 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.[8] Studies done in Thailand, Nigeria, and Tanzania reported an association between the act of voluntary blood donation and secondary school education.[9]

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.[3] 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.[10] 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.[11]

Young adults are the most favorable and targeted category when it comes to donating blood.[11] 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 in 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 145, 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] Kamel et al. reported a 0.41%
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.\textsuperscript{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 \textit{et al.} study, with a similar report.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{6}

More than half (57.6%, \textit{n} = 174) of the female students did not consider themselves as being knowledgeable about blood donation. 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.\textsuperscript{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.\textsuperscript{7} The majority also felt morally or religiously motivated to donate, similarly to the study done in Jeddah.\textsuperscript{11} However, in contrast to the Jeddah study, the majority of the current sample strongly agree (25.4%, \textit{n} = 77) and agree (34.4%, \textit{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.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.8

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.

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