Knowledge of Portuguese nursing students about blood donation

Conhecimento de estudantes portugueses de enfermagem sobre doação de sangue

Conocimientos de estudiantes portugueses de Enfermería sobre donación de sangre

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Abstract

Objective: To assess the level of knowledge of nursing students regarding blood donation, to identify the importance consider challenges for blood donation, and to determine the most used digital communication channels.

Methods: This research was performed at University of Central Portugal in 2018/2019. This was a descriptive cross-sectional study. A total of 165 nursing students completed online two ad hoc questionnaires.

Results: The level of knowledge can be classified as very low (interval between donations, waiting time after getting a tattoo or piercing, waiting time after taking iron supplements), low (amount of blood, eating before donation), medium (age and minimum weight, universal donor) and high (cases in which the blood was analyzed). The reasons for not donating blood that gained considerable and great importance were: "Because I have a physical or medical condition that makes me ineligible to donate" and "Because I had a risky sexual behavior".

Conclusion: The lack of knowledge about the eligibility requirements can make someone wrongly consider that he or she cannot donate blood. Considering the results obtained and the access to digital communication channels, the implementation of eHealth programs is recommended to promote more knowledge, and to reduce the barriers for blood donation.

Resumo

Objetivo: Avaliar o nível de conhecimento de estudantes de Enfermagem face à doação de sangue; identificar a importância atribuída às barreiras para a doação de sangue; e, identificar os meios de comunicação digital mais utilizados.

Métodos: Trata-se de uma pesquisa realizada numa Instituição de Ensino Superior da Região Centro de Portugal no ano letivo de 2018/2019. O estudo é descritivo, de natureza transversal, através de dois questionários ad hoc, preenchido on-line por 165 estudantes de Enfermagem.

Resultados: Os conhecimentos podem ser considerados de *muito baixos* (intervalo entre as doações; tempo de espera depois de fazer uma tatuagem ou um piercing; tempo de espera entre a ingestão de ferro; *baixos* (quantidade de sangue e alimentação prévia), *médios* (idade e peso mínimo, dador universal) e altos (casos em que o sangue é analisado). Os motivos para não doar sangue que assumiram *bastante e muita importância* foram "Porque tenho alguma condição física ou médica que me impede doar" e "Porque mantive práticas sexuais de risco".

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Conclusão: A falta de conhecimentos sobre as condições de elegibilidade pode fazer com que uma pessoa considere, de forma errada, que não pode doar sangue. Tendo em conta os resultados obtidos e o acesso aos meios de comunicação digital, sugere-se que sejam implementados programas de e-saúde que promovam o aumento de conhecimentos e a redução de barreiras à doação de sangue.

Resumen

Objetivo: Evaluar el nivel de conocimiento de estudiantes de Enfermería sobre la donación de sangre, identificar la importancia atribuida a las barreras para la donación de sangre e identificar los medios de comunicación digital más utilizados.

Métodos: Se trata de un estudio realizado en una Institución de Enseñanza Superior de la región centro de Portugal en el año lectivo 2018/2019. El estudio es descriptivo, de naturaleza transversal, a través de dos cuestionarios *ad hoc* que fueron completados en línea por 165 estudiantes de Enfermería.

Resultados: Los conocimientos pueden considerarse *muy bajos* (intervalo entre las donaciones, tiempo de espera después de hacerse un tatuaje o piercing, tiempo de espera después de la ingesta de hierro); *bajos* (cantidad de sangre y alimentación previa); *medios* (edad y peso mínimo, donante universal) y *altos* (casos en que se analiza la sangre). Los motivos para no donar sangre que tuvieron *bastante y mucha importancia* fueron "Porque tengo alguna condición física o médica que me impide donar" y "Porque mantuve prácticas sexuales de riesgo".

Conclusión: La falta de conocimientos sobre las condiciones de elegibilidad puede provocar que una persona considere, de forma equivocada, que no puede donar sangre. Teniendo en cuenta los resultados obtenidos y el acceso a los medios de comunicación, se sugiere implementar programas de eSalud que promuevan el aumento de conocimientos y la reducción de barreras para la donación de sangre.

Introduction

Blood is an essential element for life and cannot be replaced artificially. Voluntary, responsible and altruistic blood donation is the only means to meet the growing needs of blood resulting from the increased life expectancy and medical-surgical procedures. Therefore, recruiting new donors or retaining those who had already donated is fundamental to guarantee enough donations required daily.

The Portuguese Hemovigilance System has been implemented in Portugal since 2008 in compliance with the Law 267/2007 from July 24, which is translated into a national law of the European Parliament and Council Board 2002/98/EC and the European Commission Board 2005/61/EC. The responsibility of guarantee the functioning of the Portuguese Hemovigilance System is assigned to the Instituto Português do Sangue e da Transplantação (IPST).[1]

Blood donation can be done in Blood and Transplant Centers in Lisbon, Porto and Coimbra or in hospital units that collect blood donations. Collection planning by day, district, district and council, collect place and center is available at IPST's website. The potential donor must submit an identification document with photo and complete a questionnaire. Then, the person will be assessed by a qualified health professional who will determine the eligibility to donate blood, through a clinical evaluation and physical examination. Blood donors are identified with the National Blood Donor ID Card that contains the donation records according to national databases of the national donor card.[2]

In Portugal, during the last few years, we have seen a significant decrease of new donors and of units of blood obtained.[3] Some recent studies reveal that, during the last 7 years, in Portugal, the number of donors has decreased by 40%.[4]

In this context, recruiting and retaining donors in educational institutions becomes a key fact. Young individuals is a perfect group because they have many years ahead to donate and, due to their characteristics and dynamism, they tend to be healthy, idealists and self-motivated, thus constituting an excellent group of potential voluntary unpaid blood donors.[5-7]

Promoting blood donation among university students involves the need of investigating the elements that may promote or inhibit it. To do so, it is necessary to know what elements are related to donation and if individuals have the required knowledge to make the decision of donating or not donating blood.[8]

Concerning the **knowledge**, different studies revealed that knowledge about blood donation is not enough and many young people have mistaken ideas[9] that require clarification.[7] Research in this field is crucial for two reasons. First, it is confirmed that there is a greater motivation for donation when people are well informed about the process and benefits.[10] Secondly, this information will allow health promotion policy makers to elaborate contextualized training campaigns, adapted to different

age groups,[11] which may increase students' knowledge[12] and may help to foresee strategies, messages and actions[4] to make an impact.

On the other hand, published literature review helped us to identify different barriers that make young people decide not to donate blood. These obstacles refer to, first, **personal reasons or prejudice**, such as medical causes,[4,6] fear of acquiring a disease or infection[9,12,13] or believe that blood is commercialized.[4,11] Second, we identified a number of barriers related to **fear**, such as fear of pain[9,12,14] during the extraction procedure/needles[4,13,15] or rejection to hospital environment,[11,15] among others. Other obstacles that can be named **pretext** were identified, including not thinking about donating,[4,14] lack of time,[9,12,13] nobody asked them to do it[4,9,12] and have little information.[9,15]

This study aimed to provide evidence about knowledge and barriers to blood donation in Portuguese university students, specifically future nurses, since there is little scientific evidence about this subject in this country, where its donation rate (32.4 out of 1000 inhabitants) keeps moving away from the rates of its neighbor countries, such as Spain, although it is still within the margins of high-income countries according to the WHO.[16-18] Results presented can be useful for health care providers (nurses and others) to design actions to increase blood donation among university students. In Portugal, young people aged between 18 and 24 years old barely reach 14.35% of total donors, although IPST focuses in the promotion, awareness-rising and education of blood donation in elementary and high schools and universities, among other social organizations.[16,19]

The objectives of our study are:

1. To assess the level of knowledge regarding blood donation of nursing undergraduate students from university in the Central Portugal.
2. To identify the importance that students give to barriers related to blood donation.
3. To determine the most widely used digital communication channels by nursing undergraduate students as an attempt for future use in recruitment campaigns.

Methods

This was a descriptive cross-sectional study, with a quantitative approach, including 165 nursing undergraduate students (attending first to fourth year) from a university of Central Portugal. Data were collected during the academic year 2018/2019. Students who attended classes in January and February 2019 were invited to participate and the ad hoc on-line questionnaires were completed during this period. The nature and objective of the study were explained and the contact information of the researcher was provided. All participants signed the consent form. Confidentiality of participants' information was guaranteed.

Two questionnaires were used to assess the knowledge and attitudes regarding blood donation. The first questionnarie was elaborated to measure the level of knowledge and included 10 questions, with multiple answers, but only one was correct (the score obtained was 0 to 10 points). The dependent variables of the study were the correct answers, where the assessment of level of knowledge about blood donation was obtained from the 10 questions from the *ad hoc* questionnaire.

Similarly, another questionnaire was elaborated to identify the importance given to barriers of blood donation, to understand the reasons that justified not donating blood based on a Likert scale from 0 to 5 points in which the participants declared the level of importance (from unimportant to very important), grouped in 3 dimensions: personal reasons and prejudice, fears and excuse (Chart 1). Previous studies and IPST standards were taken into consideration. The scale's reliability analysis of the barriers to blood donation showed a Cronbach's alpha score of 0.893, revealing a high internal consistency.

Statistical analysis was conducted with SPSS 20.0 for Mac (IBM inc.). Descriptive analyses were used (frequencies, percentages and means) to describe the sample. Taking into consideration that the distribution was not normal and that variables were ordinal, non-parametric tests and were used to prove that there were significant differenc-

Chart 1. Barriers to blood donation

PERSONAL REASONS AND PREJUDICE	I1	Because I had a risky sexual behavior
	I2	Because I got a tattoo, piercing or acupuncture
	I3	Because I have a physical or medical condition that makes me ineligible to donate
	I4	Because of my religious beliefs
	I5	Because I am afraid of getting sick
	I6	Because I doubt about the sterility of the material
	I7	Because my parents, friends or relatives told me to not donate blood
	I8	Because I believe blood is commercialized
	I9	Because I feel uncomfortable with the interview questions before donation
FEARS	II1	For the fear of feeling pain
	II2	Because I am afraid of the blood donation procedure
	II3	Because I am afraid of blood loss
	II4	Because I am afraid of the hospital environment
	II5	Because blood donation makes my body weak
PRETEXTS	III1	Because I do not think about blood donation
	III2	Due to the lack of time
	III3	Because I do not know where to donate
	III4	Because nobody asked me to do it
	III5	Because I have little information about blood donation

es regarding level of knowledge and barriers experienced. The level of significance (alpha) 0.05 was established.

The Mann–Whitney U test was used to assess if there were differences of the level of knowledge and barriers regarding the variable *gender* and *previously donated*. In all cases, the first thing done was the comparison using the mean of the items score that comprised each dimension. After that, in the cases with significant differences, comparisons of each item of the dimensions were done.

This study was approved by the institution board of directors and ethics and research committee of the institution (no. 5/2019). Development of this study followed national and international ethical and legal aspects of research on human subjects.

Results

Of all participants, 84.4% were women, 13.9% were men and 1.2% were transsexual. Participants' mean age was 21.5 years old (SD 3.07). Concerning blood donation, only 21.8% was donor. This result was not justified by the existence of problems that banned the donation, since only 18.8% provided that information. Almost all students (98.2%) considered blood donation as necessary.

The results showed that the general level of knowledge of the sample evaluated in this study was low (M = 4.00, TD 1.71). To perform the individual analysis of each evaluated item, the scoring was obtained through absolute frequency allocation of correct answers, the percentages were divided in quarters: from 0% to 25%, from 26% to 50%, from 51% to 75%, and from 76% to 100%. These figures were related to the descriptors: "very low knowledge", "low knowledge", "medium knowledge", and "high knowledge", respectively. The questions that reveal a low level of knowledge are the ones related to how often one can donate and waiting time, after getting a tattoo or piercing and after taking iron supplements, or time needed to wait to drink alcohol after donation (Chart 2).

Chart 2. Level of knowledge of students from an Undergraduate Nursing Course about blood donation

Question	Correct answer	Success proportion (frequency) n(%)	Level of knowledge
What is the minimum age to donate blood?	18 years old	108(65.5)	medium knowledge
What is the minimum body weight to donate blood?	50 Kg	117(70.9)	medium knowledge
How often can someone donate blood (minimum interval between donations)?	2 months	21(12.7)	very low knowledge
How long does someone need to wait to donate blood after getting a tattoo or piercing?	4 months	23(13.9)	very low knowledge
I have had anemia and taken oral iron supplements. How long is it necessary to wait between iron intake and donation?	2 months	12(7.3)	very low knowledge
How much blood is extracted in a donation?	450 ml	70(42.4)	low knowledge
Which blood type is considered universal donor?	0-	100(60.6)	medium knowledge
What are the cases that donated blood screen is conducted?	Always	139(84.2)	high knowledge
Before blood donation, it is recommended	To have eaten within the last hours	50(30.3)	low knowledge
How long should I wait to drink alcohol after blood donation?	You must wait at least 6 hours	21(12.7)	very low knowledge

Regarding the barriers to blood donation, participants gave more importance to the following reasons (Chart 3): "to have a physical or medical condition that makes me ineligible to donate (M = 3.04), "to have a risky sexual behavior" (M=2.36), "do not know where to donate" (M=2.27), "to have limited information about donation"

Chart 3. Importance given to barriers for blood donation by students from an Undergraduate Nursing Program

Question/Likert scale	Proportion (frequency)				
	This reason is not important at all n(%)	This reason is not very important n(%)	This reason has some importance n(%)	This reason is considerably important n(%)	This reason is very important n(%)
I have a physical or medical condition that makes me ineligible to donate	56(33.9)	8(4.8)	28(17.0)	20(12.1)	53(32.1)
I had a risky sexual behavior	91(55.2)	9(5.5)	11(6.7)	22(13.3)	32(19.4)
I do not know where to donate	72(43.6)	25(15.2)	37(22.4)	13(7.9)	18(10.9)
I got a tattoo, piercing or acupuncture	88(53.3)	16(9.7)	26(15.8)	19(11.5)	16(9.7)
I doubt about the sterility of the material	93(56.4)	30(18.2)	26(15.8)	5(3.0)	11(6.7)
Because of my religious beliefs	100(60.6)	18(10.9)	25(15.2)	13(7.9)	9(5.5)
I have little information about donation	72(43.6)	27(16.4)	42(25.5)	15(9.1)	9(5.5)
Lack of time	94(57.0)	31(18.8)	27(16.4)	6(3.6)	7(4.2)
I am afraid of blood loss	98(59.4)	29(17.6)	30(18.2)	2(1.2)	6(3.6)
Nobody asked me to do it	129(78.2)	14(8.5)	14(8.5)	3(1.8)	5(3.0)
I do not think about blood donation	91(55.2)	29(17.6)	33(20.0)	7(4.2)	5(3.0)
I am afraid of the blood donation procedure	75(45.5)	36(21.8)	36(21.8)	13(7.9)	5(3.0)
I am afraid of getting sick	104(63.0)	34(20.6)	20(12.1)	2(1.2)	5(3.0)
For fear of feeling pain	78(47.3)	40(24.2)	33(20.0)	10(6.1)	4(2.4)
Donating makes my body weak	87(52.7)	47(28.5)	22(13.3)	5(3.0)	4(2.4)
I believe blood is commercialized	107(64.8)	31(18.8)	20(12.1)	3(1.8)	4(2.4)
I am afraid of the hospital environment	107(64.8)	43(26.1)	10(6.1)	2(1.2)	3(1.8)
My parents, friends or relatives told me not to donate blood	125(75.8)	21(12.7)	12(7.3)	4(2.4)	3(1.8)
I feel uncomfortable with the interview questions before donation	99(60.0)	42(25.5)	19(11.5)	2(1.2)	3(1.8)

(M=2.16), "to get a tattoo, piercing or acupuncture" (M=2.15).

We have not found statistically significant differences of participants' attitudes and level of knowledge related to the variable gender. We only found statistically significant differences about the level of knowledge concerning the variable *"previously donated* (U = 1481,500.00, p = 0.001), showing that the participants that had previously donated obtained significantly higher scores about the knowledge of blood donation. In the analysis by items, we verified that people that had previously donated showed significantly higher levels of knowledge about the questions "amount of extracted blood" (U = 1767,000, p = 0.011), "blood type considered universal" (U = 1894,500, p = 0.046) and "recommended food consumption before donation procedure" (U = 1654,500, p = 0.001). Regarding the most widely used digital media channels, 67.3% of students used Instagram and Facebook on a daily basis from their cellphones (35.2%) or from their cellphones and computers (52.7%). Of participants, only 1.2% of them did not use social medial on a daily basis (Instagram, Facebook or Twitter).

Discussion

Based on the results found, we can state that this study provides important information about the limiting conditions for blood donation procedures in a group of nursing students from a university in Portugal, where donation rates decreased over the past few years.[16] This information is useful to design awareness and promotion campaigns for blood donation.

The results obtained in our study showed a low percentage of blood donors among university students (21.8%), similar result as observed in previous research.[9,20] Assessing the level of knowledge is important because low level of knowledge has a negative effect on blood donation rate.[9,21,22] The results of this study reveal that the level of knowledge about blood donation is low, and that participants who had previously donated had a higher level of knowledge than those who did not. Similar results were found in other studies.[9,11,12,23] However, our data differ from the results obtained in other studies, where the level of knowledge of students was considered high.[24-26]

Participants of this study will soon be health professionals, so the lack of knowledge about

blood donation is a main concerning. It is important that they are aware of the importance of this issue, since they are not only possible donors, but also responsible for promoting and conducting educational activities for general population. The students who participated in the study gave more importance to barriers related to "personal reasons and prejudice" and "excuses". In this regard, the students expressed the obstacle "to have a physical or medical condition that makes me ineligible to donate" more often, confirming the data obtained in other studies already carried out in this area,[14,15,20] but differing from others performed within Portuguese context.[4,27] "to have a risky sexual behavior" and "to get a tattoo, piercing or acupuncture" were barriers frequently identified by the participants, but not explicitly assessed in none of the previously published studies.

Other challenges indicated in our research are related with the dimension *excuse* were "do not know where to donate", followed by "to have poor information about donation", barriers that are not mentioned in other similar studies, in which the more frequently cited reasons in the dimension *excuse* are: "lack of time"[8,13,15] and "*because nobody asked me to do so*".[4,8,9,12]

A fact that was really surprising was that the reasons for the dimension "fears" were not the more frequently mentioned by the participants, since this is the most common barrier in the majority of the studies.[3,6,28] This result may be related to the participants' academic profile, who are students from an undergraduate nursing program.

One last point investigated in our study was about the use of digital media channels used by students. Result showed that almost all the participants use social media on a daily basis. This information is important because it reveals which digital media are more frequently used by students. This datum can be useful to support the decision about what channel to use for educational campaigns to promote health and awareness campaign for this specific group. So far, IPST develops promotional and educational activities through workshops and activities with television networks and films, as well as it has organized visits to schools, trade shows and parties, with the possibility of donating in mobile units or fixed sites. Strategies by social media are not promoted and these channels should be explored and taken into consideration, since Portuguese students think they are useful for knowledge acquisition, and to express and diffuse their own opinions.[16,19,29]

Conclusion

This study was conducted to assess the level of knowledge of university students regarding blood donation, as well as to identify the importance given to barriers related to the act of donating. We were able to confirm that knowledge about blood donation is low, and that there is need to increase it since it may have an effect on donation rates. We also observed that there are important obstacles that influence on the decision of donating. Furthermore, we identified the most widely used digital media channels by the students. Nursing students are a specific group which can become aware and conscious about blood donation through social networks, especially Instagram and Facebook. To continue to understand how the use of social media influences blood donation promotion campaigns is really important, as well as to improve the synergic relationship between the health care system and teaching institutions to increase donation rates among young people.

Collaborations

Otero LC, Marques E, Martínez-Santos A-E, Rodríguez-González R and Iglesia JCF contributed to the design of the study, analysis and interpretation of data, drafting the manuscript, relevant critical review of the content and approval of the final version to be published.

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