



RESEARCH ARTICLE

AWARENESS ON BLOOD DONATION AMONG THE NURSING STAFF

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Mangalore, India-575001**Abstract****Introduction**

Nurses, who primarily deal with transfusion of blood components must have a thorough training on the protocols to be followed in transfusion, which is an elaborate process and thus is amenable to errors leading to serious transfusion related injury. In centers lacking adequate manpower, donor recruitment and screening also becomes a part of the nurses' duty.

Methods

132 nurses in KMC hospital, Mangalore, India a tertiary care hospital were assessed primarily for knowledge and awareness regarding blood donation. Questionnaire regarding blood donation criteria, transfusion reaction and steps taken to manage such emergency were distributed and the data collected was analyzed descriptively as well as inferentially.

Result

120 responders faltered in the awareness of at least one of the parameters. A majority, that is 56.82% were unaware of the age group permitted to donate blood. 29.54% of nursing staff were not aware of blood donation interval of 3 months. 38.63% of nurses were not informed about the minimum weight required for blood donation. 43.93% of the nurses had incomplete knowledge of the donor deferral criteria in the blood bank with respect to certain diseases.

Discussion

An interventional strategy in the form of repeated short courses with respect to blood banking has to be contemplated because a significant number of nurses faltered in the basic aspects of blood donation ($p < 0.0001$, in three parameters, $p = 0.0007$ in one).

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Introduction

Transfusion of blood, being a complex process entails potential for error at every step.¹ Nurses, being the providers of first hand health care to patients, and the community; need to possess a comprehensive and accurate knowledge of every step of transfusion so that a major mishap is averted. Transfusion of the wrong blood component is reportedly the commonest risk associated with transfusion.¹ There are also reports about erroneous decisions occurring in compatibility tests performed at bedside as well as deficits in knowledge and practice about labeling of

tubes after phlebotomy to be sent to immunohematology.² In our experience, nurses are required to promote donor recruitment, in addition to executing routine procedures associated with transfusion, particularly in blood donation camps. As a whole, nurses do play a role in blood transfusion, sometimes major and sometimes minor at every point from its extraction from the donor till its propitious administration in a needful recipient. Thus, they should have ample and factual knowledge about selection of donors, transfusion reactions and the steps taken to prevent and treat such, if one arises.

Aim

To study and assess:

1. primarily, awareness of the criteria for blood donation among nursing staff in Kasturba Medical College, Mangalore, a tertiary health care hospital;
2. the knowledge of transfusion reaction and steps taken to treat such condition.

Methods

Questionnaires regarding blood donation KAP (knowledge, attitude and practice) were distributed to 132 nurses in KMC hospital, Mangalore, a tertiary care teaching hospital with superspecialty departments and a large blood bank. Oral consent was taken from each of them before the questionnaire was distributed. The questions were designed to evaluate the responder's knowledge and awareness regarding blood donation (Chart 1).

Totally there were 11 questions. None of the questions were demographic; all were knowledge survey questions. All the questions were validated by their curriculum content and verified by a member of the teaching faculty in addition to the ethics committee of the institution approving the same. There were no questions on checks performed before transfusion as this was designed as a blood donation KAP study. The questions were not of multiple choice type. The nurses had to write the answers from memory, which eliminated answering based on chance. Two queries, whether pregnant or lactating women could donate blood had a choice between true and false and were thus amenable to guessing. The objectivity and nature of the questionnaire precluded any leeway for speculation except for one and was thus appropriate to evaluate the knowledge of the nurses on the guidelines of donation on a robust scale without bias.

All the nurses who participated in the study had a service experience between 1 and 3 years in patient care, but only a few of them were deputed to blood bank duty. Unlike other studies, knowledge scores were not stratified into three levels of good, average and poor. Such classification would not have met our objective. A 100% score in the core knowledge sector was our expectation, since, anything lower than that would translate into unsafe or unacceptable practice.

The observations are given below. A score of '0' implies absolutely no knowledge of the parameter in question. A score of '0.5' indicates partial information. For statistical purpose, no discrimination was made between a '0' and '0.5', both were taken as '0' because we did not deem partial knowledge to be enough for proper independent functioning. Data were analyzed using

descriptive and inferential (Chi-square) statistical methods.

Results

The sum total outcome of the study is shown in Table. 1.

The age group permitted to donate blood was known to 43.18 % (58/132) of nurses. 53.03% (70/132) knew either the upper or the lower age limit of donation but not the complete range. 3.78% (5/132) were totally ignorant of permitted age group for blood donation.

The criterion of minimum blood donation interval of three months was incorrectly identified by 29.54% (39/132) of nursing staff. A 6-month interval between donations was their commonest perception.

The norm of minimum weight required for blood donation could not be determined by 38.63% (51/132) of nurses.

Knowledge about blood components and their availability in the hospital was fairly good. Only 6.81% (9/132) of the nurses were not aware of the different blood components available in the blood bank.

Comprehension about donor deferral criteria in the blood bank with respect to certain diseases were partially fulfilled by 43.93% (58/132) of the nurses. Most of them considered schizophrenic and epileptic patients fit to donate blood. 56.07% (74/132) were knowledgeable of the different diseases for which donors are refused by the blood bank.

Transfusion from the blood related donor was believed safest by 33.33% (44/132). 66.66% (88/132) knew the entity of graft versus host disease and its implications.

All the nurses knew that pregnancy and lactation were major contraindications for blood donation.

Reluctance to donate blood was noted in 38.63% (51/132) of nurses who had valid reasons for refusal. 61.36% (81/132) wished to donate blood.

All the nurses knew very well the signs and symptoms of suspected transfusion reaction. 6.81% (9/132) did not completely know the steps to be taken to manage a suspected transfusion reaction. 93.18% (123/132) were confident they could manage a presumed transfusion reaction.

A few startling facts came to light with regard to responses on (1) the permitted age range, (2) minimum weight of the donor, (3) the interval between two donations and (4) the diseases for which a donor is deferred.

Fifty three out of 132 respondents did not know one parameter, 42 were not aware of two, 18 were ill-informed of three and 7 nurses knew none of

the four. Merely 12 persons had completely knowledge of all the four components. Of the 53 nurses who faltered in any one of the four parameters, 32 were not aware of the minimum weight, 15 failed to answer correctly the age range and one did not know the minimum interval admissible for blood donation. Moreover, five nurses failed to state correctly the diseases for which a donor is refused.

Of the 42 nurses failing to answer two criteria, 20 were not aware of the age range permitted for donation as well as the diseases for donor deferral followed by nine not knowing correctly the age range along with minimum interval between two consecutive blood donations.

If an intervention has to be contemplated with a view to impart adequate knowledge about blood donation to nurses, the following significance values warranted attention:

1. 120 responders faltered in the awareness of at least one of the parameters. This is significant as $\chi^2 = 109.0909$, $p < 0.0001$.
2. Age range acceptable for donation – with regard to this factor, 75 people did not possess the complete knowledge, while 70 of them were aware of the lower age limit permitted to donate blood. Thus, it is significant as $\chi^2 = 42.613$, $p < 0.0001$.
3. Interval between two donations – 39 persons was ill informed. It is significant as $\chi^2 = 11.5227$, $p = 0.0007$.
4. Weight – since 51 nurses were not conscious of the minimum weight of the donor, it is significant as $\chi^2 = 19.7045$, $p < 0.0001$.
5. Diseases justifying deferral of donors – 58 responders had a wrong perception of this parameter. This is significant as $\chi^2 = 25.4848$, $p < 0.0001$.

Discussion

A study on awareness and perceptions regarding blood safety and blood donation among health care providers was conducted in R.G Kar Medical College, Kolkata. Twenty five nurses participated in the study among other groups such as doctors, trainee doctors, group D staff and other office staff. Age range suitable for donation, minimum weight of donors and acceptable interval between two donations were known to 1/25 (4%), 6/25 (24%) and 6/25 (24%) nurses respectively. However 21/25 (84%) nurses were knowledgeable about needle safety and 15/25 (60%) were familiar with banning of professional donors.³ This data directs our attention to the deplorable state of expertise among nurses in India about the guidelines of blood donation. The corresponding data in our study were 58/132 (43.18%), 81/132 (61.37%) and 93/132 (70.46%) respectively. The percentages in our study are

appreciably higher than that of Kolkata's but, nevertheless poor and far removed from expectation. We did not question needle safety or awareness of banning professional donors as these are obvious and reiterated quite a number of times in the nurses' training update curriculum.

In a study by Devi et al involving 1st and 2nd MBBS students done on blood safety and donation, only 33.1% revealed to possess adequate knowledge⁴ compared to 9.1% in our study who possessed complete and thorough knowledge about donation. The study groups were albeit, different and the rigorous criteria that we employed in our study were not apparently followed in theirs.

A descriptive study to identify lacunae in knowledge and blood transfusion practice of 100 nurses was conducted in three hospitals in Ankara, Turkey against a total score of 100. None of the nurses scored 100. A positive correlation existed between knowledge and practice scores but the correlation coefficient was insignificant. Statistically, experience scores correlated with knowledge scores significantly but not with practice scores. Insufficient knowledge about blood transfusion among nurses was the conclusion that resulted in undesirable practice.⁵ Our nurses scored very high in knowledge about transfusion reactions and the steps taken to treat it and so we may safely conclude that the knowledge of the nurses in our study obviates any fears regarding undesirable practice in transfusion.

In a study by Reza et al of 122 health care workers (HCW), including nurses, midwives, technicians and other staff on proper methods of blood and components transfusion, 51.6% had good knowledge, 22.2%, moderate and 26.2%, weak level of knowledge. The 'knowledge' questions divided into four parts included those on procedure before transfusion, essential medical tests for blood and component transfusion, procedure during transfusion and complications arising thereof. Fifty nine percent and 68.8% of the responders were well familiar about procedure before and during transfusion respectively. Complications of blood and component transfusion and the essential medical tests for blood and component transfusion were areas that elicited a poor response with only 35.2% and 22.1% of the HCWs possessing good knowledge.² In a geographically remote comparison, 100% of the nurses in our study had adequate working knowledge of transfusion reactions and 93.2% could deal with such untoward incidences. Of the 47 HCWs who underwent training on blood and component transfusion, 30(63.83%) showed a good level of knowledge in contrast to 33(44%) responders of 75 who were not exposed to the exercise.² Thus, the training had a positive

influence on knowledge of blood and component transfusion

A precedent, statistically apt study regarding knowledge about guidelines of blood donation among nurses was lacking in literature. On all the four basic parameters, namely, the age range of donors, minimum weight, acceptable interval between two donations and diseases for which a donor is usually deferred, the nurses in our study revealed unpardonable gaps in knowledge. As mentioned in the results section, the non-familiarity in each of these areas is significant and needs immediate attention. The number of responders who did not know at least one of these parameters was 120 among 132 (90.9%).

A study on nurses' knowledge on blood transfusion by Aslani et al in Iran revealed average performance, despite 56.3% of the nurses out of 117 having a work experience of more than 4 years. Nurses' knowledge on blood and its components showed 21.4% good, 66.7% average and 12%, poor performance in 10 questions regarding this topic. Their familiarity with the indications and side effects of blood components infusion exposed good knowledge among 16.2%, average and poor among 59 and 24% respectively out of nine questions answered by them. 65.8% displayed average awareness out of 10 questions on the topic of blood component infusion.⁶ We feel knowledge of components and their indications of transfusion is not strictly a nurse's theme; the physician dictates what the patient should be given. The nurse's duty is merely to ensure that the classified component is given to the designated patient and the appropriate infusion technique is being followed. She also has to keep watch for any transfusion related reaction and discharge proper duty in post transfusion care. Of all these, pre-transfusion check is the most important. Disasters related to deficits in pre-transfusion check have occurred, though rarely in our setting as well. Aslani et al did not assess knowledge of donor recruitment criteria.

A study on knowledge attained and retained in students exposed to safe transfusion practice, a curriculum based study program in Scotland revealed unfavorable outcomes. While knowledge retained and gained in six months following the program enhanced positively with experience, it degraded to everybody's dismay by 12 months. The obvious deduction that practical experience following theoretical input augments knowledge was wrecked at its foundation. This hypothesis was based on the premises that practical hands-on experience reinforces theoretical knowledge. Perhaps realistic workplace practice contradicts whatever is learnt in theory – a conjecture to justify opposition of an

apparent assumption. Even qualified practitioners suffer deterioration of knowledge with ongoing experience. The sample size in the study by Smith et al was small, numbering 31 subjects; perhaps the conclusion that knowledge depreciates over time even with experience requires a study involving a larger number of subjects to be statistically viable. Incorporation of simulated exercises within the theory had a positive impact but the long-term retention of knowledge even with inclusion of simulation exercises is yet uncertain.¹

We would like to propose a short 4-6-hour crash course on blood donation and transfusion every 6 months to the nurses followed by a short evaluation test. The crash course would be partly instructional, centered on power-point presentations and partly simulation based exercises. Randomly, one the attendees could be chosen for each part of the exercise. The exercises would range from recruiting a mock donor till pre-transfusion checks on mock recipients. Various transfusion reactions could be also be imitated by trained staff in transfusion medicine responsible for educating the nurses and the member of the faculty could ask the nurses on their prescribed mode of action as required to deal with the exhibited transfusion reaction. The nurses who worked in blood bank in the last 6 months could be exempted from attending the course. A 6-month interval is chosen on two grounds. 1. If frequency is increased, attendance could be inadequate, because we have to incessantly grapple with restraint in human resource. 2. The study by Smith et al has shown that influence of experience on knowledge retention has a positive effect at 6 months but wanes off at 12 months.¹ The poor performers, even after the course may be barred from transfusion related practice. It has also been borne out by the study of Reza et al that training improved knowledge of blood and component transfusion.² We also agree with Reza et al that guidelines and procedural protocols for the nursing staff are developed in accordance with relevant Council of Europe recommendations.²

Lastly, majority of the responders wanted to donate blood out of social responsibility and a minority, in self motivation. The persons not willing to donate were either lactating, pregnant or possessed low hemoglobin. An old study in Eastern India revealed that only 35% of donors donate blood as an act of social responsibility, 60% in self motivation and 68% on humanitarian grounds.³ Blood donation has become such a mundane act in this part of India (Mangalore is in south-western coast of India) that people need not feel noble to donate blood on humanitarian grounds alone. Most consider it a social responsibility – a mindset brought about by numerous

blood donation camps and exhorting the common man to donate blood.

Conclusion

As reflected in the study, awareness about the guidelines of blood donation among nurses is poor. A nurse's curriculum focuses on aspects of blood components transfusion starting from pre-transfusion check to post-transfusion care, transfusion reactions and procedures to deal with them. Donation criteria may not be adequately emphasized. In this age of global cost-cutting and manpower constraints, workplace environment might test a nurse's knowledge on donation criteria, a deficiency of which might result in improper blood being accepted or a preventable mishap having taken place. An interventional strategy in the form of repeated short courses (preferably after every six months) with respect to blood banking has to be taken up because a significant number of nurses faltered in the basic aspects of blood donation ($p < 0.0001$, in three parameters, $p = 0.0007$ in one). Their level of knowledge however, in blood transfusion reactions and the steps taken to prevent and treat such incidences is satisfactory. Their willingness to donate blood deserves praise.

References

1. Smith FC, Donaldson J, Pirie L. Pre registration adult nurses knowledge of safe transfusion practice: Result of a 12-month follow up study. *Nurse Education in Practice* 2010; 10: 101-107
2. Reza PA, Aziz SV, Ali MA, Marjan MH, Reza TM. Evaluation of knowledge of healthcare workers in hospitals of Zabol city on proper methods of blood and component transfusion. *Asian Journal of Transfusion Science* 2009; 3: 78-81.
3. Mitra K, Mandal PK, Nandy S, Roy R, Joardar GK, Mishra R. A study on awareness and perceptions regarding blood safety and blood donation among health care providers in a teaching hospital in Calcutta. *Indian Journal of Community Medicine* 2001; 26: 21-26.
4. Devi HS, Laishram J, Shantibala, Elangbam V. Knowledge, attitude and practice (KAP) of blood safety and donation. *Indian Medical Gazette* 2012; Jan: 1-5.
5. Bayraktar N, Erdil F. Blood transfusion knowledge and practice among nurses in Turkey (Abstract). *Journal of Intravenous Nursing* 2000; 23: 310-317
6. Aslani Y, Etemadyfar S, Noryan K. Nurses' knowledge of blood transfusion in medical training centers of Shahrekord university of medical science in 2004. *Iranian Journal of Nursing and Midwifery Research* 2010; 15: 141-144.

Chart 1: QUESTIONNAIRE – AWARENESS OF BLOOD DONATION

1. What should be the minimum and maximum age limit for blood donation?
Minimum ageyears
Maximum age years.
2. How frequently can a donor donate blood?days/months/years.
3. What should be the minimum weight for blood donation?kgs.
4. Blood should be preferably transfused by blood donated from a close blood related relative.
TRUE/FALSE.
Specify reasons for your answer.
5. Can a pregnant woman donate blood? Yes/No
6. Can a lactating mother donate blood? Yes/No
7. What are the different blood components available in our blood bank?
8. If a donor is suffering from any of the diseases listed below, can he/she donate/not donate temporarily or permanently?

DISEASE	CAN donate blood	Can donate AFTERspecify period	CANNOT donate blood permanently
HIV/ AIDS			
Jaundice			
Malaria			
Tuberculosis			
Typhoid			
Heart disease			
Cancer			
Epilepsy			
Schizophrenia			
Diabetics			

9. Do you wish to donate blood?
Yes/No
Specify reasons:
10. What are the signs of transfusion reaction?
11. What steps would you take in suspected transfusion reaction?

Table 1. Shows the number of correct and wrong responses of the nurses to the questionnaire

Parameter	Responders scoring		
	<i>0</i>	<i>0.5</i>	<i>1</i>
AGE	5	70	58
DURATION BETWEEN TWO DONATIONS	39		93
MINIMUM WEIGHT OF THE DONOR	51		81
COMPONENTS PREPARED AT OUR BLOOD BANK	9		123
DONOR DEFERRAL DISEASES		58	74
DONATION BETWEEN CLOSE RELATIVES	44		88
DONATION IN PREGNANCY AND LACTATION			132
WILLING TO DONATE	51		81
TRANSFUSION REACTION			132
STEPS TAKEN TO TREAT TRANSFUSION REACTION	9		123