KAP STUDY

# Frequency of Regular Voluntary Blood Donors and Factors Associated with Blood Donation in Karachi, Pakistan

***Rabisa Batool[1], Nazish Jaffar[1], Syeda Ramsha Batool[1], Insia Hasan[1], Suresh Klanghani[1], Rubina Ghani[2], Suresh Kumar[1]***
*[1]Department of Pathology, Sindh Medical College (SMC), Jinnah Sindh Medical University, [2]Department of Biochemistry, Jinnah Medical and Dental College, Karachi, Pakistan.*

**ABSTRACT**

**Background:** Regular voluntary unpaid blood donation assures safe blood supply in association with minimum infection transmission. The purpose of this study was to identify the frequency of regular voluntary blood donation and to evaluate the causes of donating blood as well as factors impeding blood donations among the medical and nonmedical students of Karachi.

**Methods:** A comparative cross sectional study was conducted among medical and nonmedical students of JSMU and NED University respectively from May to October 2018. Sample size was 272 including 137 medical and 135 non-medical students. Data was analyzed using SPSS version 22.0. Chi-square test of independence/ Fischer's exact test were applied to assess statistical significance.

**Result:** In medical group 5/21(23.8%) voluntary regular donors were recorded. In non-medical group, voluntary regular donors were found to be 8/30 (26.6%) (p>0.00). Medical students most commonly 15/21 (71.4%) donated blood voluntarily in a camp while non-medical participants frequently donated blood as replacement donors 13/30 (43.3%) (p>0.00). Major hindering factor for blood donation in both study groups was non-participation in blood donation derives i.e. 66/116 (56.8%) in medical and 53/105 (50.4%) in non-medical groups respectively. Anemia, 20/116 (17.2%) in medical and 15/105 (14.2%) in nonmedical students was the second major cause of not donating blood.

**Conclusion:** The frequency of regular voluntary blood donations is very low among undergraduates. However, comparatively, the trend is slightly higher among non-medical group. The major hindrance in not donating blood was non-participation in blood donating derives.

**Keywords:** Blood Donation; Blood Donors; Medical Students; Anemia; World Health Organization (WHO).

***Corresponding Author:***
**Dr. Nazish Jaffar**
Department of Pathology,
Sindh Medical College,
Jinnah Sindh Medical University, Karachi, Pakistan.
Email: nazish.jaffer@jsmu.edu.pk
drnazishamin@gmail.com
doi.org/10.36283/PJMD9-2/017

## INTRODUCTION

Blood transfusion is the transfer of blood and its blood components from one person (donor) to another (recipient). It is a life-saving procedure in blood related diseases and emergency situations[1]. Globally the number of blood donations collected is approximately 112.5 million; high-income countries contributed half of it[2]. WHO research performed by Fordham J. and Dhingra N. in Geneva concluded that to meet a country's basic requirement of blood demands, at least 1% of donor population is required. The lack of safe blood affects thalassemia patients, victims of road traffic

accidents and trauma, women with complicated pregnancy, cancer patients and those going through major scheduled surgeries. The provision of safe blood can reduce maternal mortality during deliveries up to 25%. In Pakistan, every year, more than 1.5 million pints of blood is collected, which is not sufficient to meet the demands of 60,000 to 70,000 thalassaemia children requiring two pints of blood each month. Currently, Pakistan is suffering from a shortfall of 40% of its blood needs[3-5].

There are three types of donors according to WHO i.e., voluntary unpaid, family/replacement and paid donors. The voluntary unpaid regular donors are the ones who donate blood at least two times a year and do not earn money from it. In India, the National AIDS Control Organization (NACO) supporting blood banks collected 84.3% blood units through voluntary donations in 2012. In Pakistan, replacement donors contribute 70% of the blood donation and 10% is contributed by paid donors[2, 6, 7].

Regular voluntary unpaid blood donors are the foundation of a safe blood supply as it is associated with minimum infection transmission rate including HIV and Hepatitis viruses. A study by Gibbs and Corcoran concluded that 80% of developing countries depend completely or partially on replacement donors, about 15% on voluntary and 25% on paid blood donations respectively. According to Global Database on Blood Safety, <25% of blood donations are of voluntary unpaid donors in Pakistan. Hence, the risk of infection transmission is more. Therefore, there is a need to raise the percentage of voluntary unpaid donors in the country[2,7,8]. Frequent blood donations are effective in reducing blood pressure, blood glucose, low density lipoproteins and heart rate in patients with metabolic syndromes. It also prevents toxic accumulations in patients with iron overload[9]. The current study was designed to identify the prevalence of regular voluntary blood donation and to evaluate the causes of donation as well as non-donations of blood among the medical and nonmedical students of two public sector universities of Karachi, Pakistan.

## METHODS

A comparative cross sectional study was conducted on medical and non-medical University students to observe the frequency of voluntary blood donors, their practice and attitude towards voluntary donation. Factors associated with blood donation were also identified. The study duration expanded over 6 months from May 2018 to October 2018. This study was approved by Institutional Review Board of Jinnah Sindh Medical University, Karachi. Written permission was taken from each institute for collection of data.

Our inclusion criteria comprised of students above 18 year of age, enrolled in M.B.B.S program at Sindh Medical College and department of Computer information and systems engineering (CIS), NED University of Engineering and Technology of Karachi. Participants enrolled in first year to final year level of these universities were included in this study. Those who did not give consent, students not enrolled in MBBS or and Engineering, and visiting students were excluded. Questionnaire was distributed among the participants in their spare time. Sample size was calculated by convenient sampling method using open EPI software. Considering population size = 2,150, anticipated % frequency = 27.2[6], Confidence level = 95 %, confidence level as +/- percent of 100 = 5, design effect =1. The sample size obtained was 272, which included 137 medical and 135 non-medical students. Each participant was well informed about the objectives of the study and a written consent was obtained from every individual, clearly explaining them their full rights to refuse to participate in this study. A self-administered predesigned questionnaire was distributed among the students of each university. The questionnaire was developed after extensive literature review using PubMed and Google Scholar. It comprised of multiple choice and close-ended questions distributed in four sections. First section comprised of demographic data including age, gender, blood group and level of study. Second section consisted of questions related to blood donation, cause of donation, screening of blood before donation, collection of screening report and registration in blood bank. Third section inquired regarding non-donation and its causes. Fourth section was related to knowledge of voluntary blood donors and their number in their families.

SPSS version 22.0 was used for data analysis. Descriptive statistics were calculated and expressed as mean and standard deviation for age of participants. Categorical variables were explained in terms of number and percentages of regular donors, their cause of donation, screening of their blood and registration in a blood bank. Chi-square test of independence and Fisher Exact test was applied to assess any statistical difference in the practice of medical and non-medical students regarding blood donation. A p value of <0.05 was considered significant. We followed the Operational definition of voluntary non-remunerated blood donor (VNRBD) by WHO.10

## RESULTS

Among 272 participants, 80 (29.4%) were males and 192 (70.6%) were females. The age range was 18-23 year with standard deviation of 3.52 ± 1.87 year. The median age observed was 21 years (19.5%).

Majority 207(76.1%) of the participants knew their blood group. The most frequent blood group noted was B positive 75 (27.6%). Out of 272 participants, 51 (18.7%) were donors. Among the donors, 21(15.3%) were medical students and 30 (22.2%) were engineering students as shown in Table 1.

**Table 1: Frequency of donors and cause of blood donation among medical and non-medical study groups.**

| Study groups | Total No. Donors | | Voluntary regular donations after every 6 months | | Voluntarily in a camp | | Replacement donor (for need of relative) | | p-V alue |
|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | N | % | n | % | |
| Medical Donors | 21/137 | 15.3 | 5/21 | 23.8 | 15/21 | 71.4 | 1/21 | 4.7 | 0.003* |
| Non-medical Donors | 30/135 | 22.2 | 8/30 | 26.6 | 9/30 | 30 | 13/30 | 43.3 | |
| Total no. of Donors | 51/272 | 18.7 | 13/51 | 25.5 | 21/51 | 41.1 | 14/51 | 27.4 | |

** Fisher Exact test*

**Table 2: Factors hindering blood donations among non-donors of both groups.**

| Factors hindering blood donation in non-donors | Medical non donors (n= 116) | | Non-Medical non donors (n= 105) | | p-Value |
|---|---|---|---|---|---|
| | N | % | n | % | |
| Needle fear | 5 | 4.3 | 14 | 13.3 | 0.155* |
| Non-participation in a blood donation derive | 66 | 56.8 | 53 | 50.4 | |
| Fear of misuse | 3 | 2.5 | 5 | 4.7 | |
| Fear of disease transmission | 6 | 5.1 | 6 | 5.7 | |
| Anemia | 20 | 17.2 | 15 | 14.2 | |
| Underweight | 14 | 12 | 9 | 8.5 | |
| Not permitted | 1 | 0.8 | 3 | 2.8 | |
| Thalassemia | 1 | 0.8 | - | - | |

** Fisher Exact test*

Medical donors mostly donated voluntarily in a camp 15/21 (71.4%). The nonmedical group commonly donated blood as replacement donors for their relatives 13 (43.3%) as shown in Table 2. The major factor impeding blood donation in both medical and nonmedical study groups was non-participation in a blood donation derive i.e. 66(56.8%) in medical and 53(50.4%) in nonmedical groups respectively. The other important hindrance was anemia in 20(17.2%) medical and 15(14.2%) nonmedical groups followed by underweight in 14(12%) medical and 9(8.5%) nonmedical groups respectively. A single case of thalassemia minor (0.8%) was noted. Majority of the donors contributed blood only once 10 (47.6%) among medical and 17 (56.6%) in nonmedical groups (Table 3).

 doi.org/10.36283/PJMD9-2/017

**Table 3: The distribution of medical and nonmedical blood donors with relation to frequency, registration, screening and family donors.**

| Variables | Participant's Responses | Medical n= 21 | | Non-Medical n= 30 | | p-Value* |
|---|---|---|---|---|---|---|
| | | n | % | n | % | |
| No. of donations | 1 time | 10 | 47.6 | 17 | 56.6 | 0.047 |
| | 2 times | 6 | 28.5 | 4 | 13.3 | |
| | 3 times | 5 | 23.8 | 3 | 10 | |
| | More than 3 times | 0 | 0 | 6 | 20 | |
| If the donors were registered? | Yes | 3 | 14.2 | 4 | 13.3 | 0.003 |
| | No | 18 | 85.7 | 26 | 86.6 | |
| Was the blood screened? | Yes | 19 | 90.4 | 19 | 63.3 | 0.06 |
| | No | 2 | 9.5 | 11 | 36.6 | |
| Was the screening report collected? | Yes | 13 | 68.4 | 8 | 42 | 0.033 |
| | No | 124 | 90.5 | 127 | 94 | |
| Are there regular donors in family? | Yes | 14 | 10.2 | 26 | 19.2 | 0.04 |
| | No | 123 | 89.7 | 109 | 80.7 | |

** Fisher Exact test*

Registered donors were slightly more 4 (13.3%) in nonmedical group as compared to medical group 3 (14.3%). Among the donors, 19 (90.4%) of medical and 19 (63.3%) of nonmedical participants respectively were sure about their blood samples being screened, out of which 13 (68.4%) medical participants and 8 (42%) nonmedical participants collected their screening reports. The frequency of regular donors in the families of nonmedical participants was more 26 (19.2%) in comparison to the families of medical participants 14 (10.2%). The common age group of regular donors in the families of participants falls between 18-25 years in 11 (30%) followed by 31-35 years in 10 (27%).

## DISCUSSION

To the best of our knowledge, this is the first study from the metropolis of Karachi, assessing the difference in practices and attitudes of medical versus non-medical university students regarding voluntary blood donation. Voluntary blood donation is the chief supply of safe blood to the needy population. In Pakistan, provision of blood supply mainly depends on replacement and paid donation[2,7].

The belief that medical students donate blood more frequently was strengthened by a study conducted in Nepal in 2012, which observed more medical donors 35.1% than non-medical donors 18% [11]. In comparison, results of the present study revealed a higher frequency of non-medical donors 22.2% then medical students 15.3%. This may be because non-medical students majorly donated blood as replacement donors. Our statistics were supported by another study conducted in Karachi in 2016, where non-medical donors were 27.5% and medical donors were 18%[6].

Majority 53 % (p=0.047) of participants in our study, have donated blood only once in their lifetime. This is comparable with a study of Jammu, India in 2017, where 66.6% subjects donated only once[12]. Furthermore, a research including university students of Sudan registered 57.8% of donors with similar practice of blood donation[13]. Another study from India reported a slightly increased frequency (64%) of donors who had only one experience of donating blood[14]. Our study involved younger age group (18-25 years) and they became eligible for donation of blood quite recently, a probable reason for a single donation.

In current study, regular donors were 25.5%. Out of which, the frequency of voluntary regular donations among medical students was 23.8% and non-medical regular donations was 26.6 % (p=0.003). Literature review did not reveal much data regarding regular blood donors. However, a study from Addis Ababa conducted on health science students recorded a comparatively increased frequency of regular donors up to 42.2% [15]. This discordance highlights the lack of appropriate knowledge and awareness regarding the significance of regular blood donation among medical as well as non-medical students in our setup.

Our study reflected that blood donors from medical group predominantly donated blood voluntarily either in a camp or regularly after 6 months 95.2%. This finding corresponds to a study conducted in Tanzania, which showed higher prevalence 90.5% of voluntary blood donation among university students[16]. Furthermore, according to the current study, 71.4% medical students tend to donate blood voluntarily in a camp. Our finding is supported by a study on medical students in Sudan in 2016, which stated that 53.8% of their donors donated blood voluntarily in a camp[17].

The possible reason for this increased frequency of voluntary donation among medical students may be explained by the fact that they have more easy access to blood donation camps and have awareness of its importance. On the contrary, non-medical students 43.3% were more involved in replacement donations especially for the need of relative or friend. Similar results were observed in another study from Karachi in which frequency of replacement donors was higher 32.9% among non-medical students[6]. This on one hand is a reflection of strong family ties, which exist in our society, and on the other hand highlights a deficiency of awareness campaigns regarding significance of voluntary blood donation.

The major factor of not donating blood was non-participation in blood donation derives, as observed in both medical 53.8% and non-medical 50.4% groups respectively. Similar study from Karachi revealed a comparatively reduced number of 30.4% medical and 34.8% non-medical students, who mentioned the same cause as a chief hindering factor for not donating blood.[6] However, a study on college students in North India contradicts our results in which only 9.8% participants never had an opportunity to donate blood[18]. Therefore, it is evident from our results that there is a major need to emphasize on the importance of blood donation by organizing awareness sessions and blood donation camps in various universities in order to facilitate the younger population to contribute more. Other contributing factors were anemia in 17.2% medical, 14.2% non-medical followed by being underweight in 12% medical and 8.5% non-medical groups. These findings are supported by a study on medical and nursing students of India in which 17% non-donors were underweight. In the current study needle, fear was found to be 4.3% among medical group and 13.3% in non-medical participants, which is parallel to the findings of an Indian study in which 5.9% medical students had needle fear. [14]

According to a research in 2018 by WHO, 71.7% of blood banks in Karachi performed blood screening test and 91% of them have donor questionnaires for screening of blood donors.[19] This verifies our result which showed that majority of the donors 74.5% had their blood screened. However, only 68% medical and 42% non-medical students have collected their screening reports (P=0.033). This shows that majority of non-medical students, are unaware of the importance of blood screening. The limitation of this study was to include only one department of Engineering University due to limited resources.

## CONCLUSION

We conclude that the frequency of blood donation is significantly low among undergraduates of Karachi. Furthermore, the trend of voluntary regular blood donation among medical and non-medical undergraduates is not satisfactory. Medical students commonly donated blood voluntarily, while non-medical students as replacement donors. The major contributing factor of not donating blood in both study groups was non-participation in blood donation derives.

## ACKNOWLEDGEMENTS

The authors would like to acknowledge the Jinnah Sindh Medical University for facilitating the research study.

## CONFLICT OF INTEREST

The authors declared no conflict of interest.

## ETHICS APPROVAL

Institutional Review Board of Jinnah Sindh Medical University, Karachi, approved this study. Written permission was taken from each institute for collection of data.

## PATIENT CONSENT

All the participants gave written consent to be included in the study.

## AUTHORS' CONTRIBUTIONS

RB conceived the idea, did manuscript writing, NJ did critical review and editing, SRB did data collection and literature review, IH did statistics, SK did literature review and final drafting, RG did statistics and given the final approval.

## REFERENCES

1. Urgesa K, Hassen N, Seyoum A. Knowledge, attitude, and practice regarding voluntary blood donation among adult residents of Harar town, Eastern Ethiopia: a community-based study. J Blood Med. 2017;8:13.
2. World Health Organization, Blood safety and availability, factsheet. Available from: http://www.who.int/mediacentre/factsheets/fs279/en/
3. Shera MT, Haider A, Bareeqa SB, Ahmed SI, Junaid MM, Khalid Z, et al. Factors refraining medical students from blood donation; a tertiary care experience from a medical college of Pakistan. ARC J Public Health Community Med. 2017;2(3):13-20.
4. World Donors Day, Pakistan. Available from: http://www.who.int/worldblooddonorday/archives/2006/wbdd_pakistan/en/
5. Sharma RK, Verma S, Sharma M, Pugazhendi S. Voluntary Blood Donation: Attitude and Practice among Indian Adults. J Community Med Health. 2016;3(436):2161-0711.
6. Anwer MO, Fawwad SH, Anwer S, Ali A. Attitude toward blood donation among medical and nonmedical students across Karachi. Asian J Transfus Sci. 2016;10(2):113.
7. Verma P, Thakur A, Saklecha D, Kasar PK. A cross sectional study to assess knowledge, attitude and practice regarding voluntary blood donation among medical students of Jabalpur, central India. Int J Community Med Public Health. 2018; 5(3):963-9.
8. Gibbs WN, Corcoran P. Blood safety in developing countries. Vox Sanguinis. 1994;67(4):377-81.
9. Uche EI, Adediran A, Damulak OD, Adeyemo TA, Akinbami AA, Akanmu AS. Lipid profile of regular blood donors. J Blood Med. 2013;4:39.
10. Nair SC, Mammen JJ. Repeat voluntary non-remunerated blood donor is the best quality indicator for blood safety. Indian J Med Res. 2015;141(6):749-52.
11. Mamatya A, Prajapati R, Yadav R. Knowledge and practice of blood donation: a comparison between medical and non-medical Nepalese students. Nepal Med Coll J. 2012;14(4):283-6.
12. Kumari S, Raina TR. Knowledge, attitude and practices (KAP) regarding voluntary non-remunerated blood donation (VNRBD) among the students of colleges of Jammu, India. Int J Community Med Public Health. 2017;2(1):45-50.
13. Tadesse W, Ayalew Y, Yisma E, Liben ML, Wudu M. Knowledge, attitude, practice and associated factors towards voluntary blood donation among regular health science students of samara university, Ethiopia. Health Sci J. 2018;12(1):542.
14. Singh S, Muninarayana C, Venkatesha M, Anil NS. Blood donation awareness and beliefs among medical and nursing students. Int J Med Sci Public Health. 2015 1;4(10):1338-42.
15. Misganaw C, Tenkir M, Deresea A, Tesfaye M, Tessema TT, Taye H. The level and associated factors of knowledge, attitude and practice of blood donation among health science students of Addis Ababa University. Int J Med Health Sci. 2014;1(10):105-18.
16. 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. 2016:8546803.
17. Mohammed H, Osman T. Voluntary Blood Donation among Medical Students in a Resource-limited Country. JPHDC. 2016;2(3):257–67.
18. Mishra SK, Sachdev S, Marwaha N, Avasthi A. Study of knowledge and attitude among college-going students toward voluntary blood donation from north India. J Blood Med. 2016;7:19–26.
19. Bibi S, Siddiqui TR, Jafry SSH, Ahmed W. Infection control practices in blood banks of Karachi. East Mediterr Health J. 2019; 25(5): 331-338.