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Original Article

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Understanding the modern sociology of blood donation, a retrospective study of voluntary blood donors belonging to district Attock Punjab, Pakistan

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ABSTRACT

BACKGROUND & OBJECTIVE: There is a huge difference in blood donation and blood transfusion demand in developing countries like Pakistan. However, the annual blood transfusion demand in Pakistan has increased up to 1.5 million bags and the blood donation ratio is still less than one percent. Our study aims to assess the sociodemographic barriers related to blood donation in District Attock Punjab, Pakistan.

METHODOLOGY: A retrospective study following a convenient sampling method was designed at the Centre for Human Genetics, Hazara University Mansehra, and conducted at District Head Quarter Hospital (DHQ) Attock, Punjab Pakistan. Sociodemographic data of the blood donors were recorded on pre-designed questionnaires and laboratory outcomes were noted after donor screening and blood group testing as well. The standard protocols for donor screening and blood group testing were ensured by the kit method.

RESULTS: According to 680 voluntary blood donors from five adjacent areas of Attock, Punjab, Pakistan, 91% of blood donors have either type of Rh +Ve blood group and only 9% have Rh-Ve blood group. A huge difference in gender-specific blood donors was recorded. The female blood donor ratio was recorded at only 1%, whereas 99% of blood donations were recorded from male donors. The mean age of donors was calculated as 28±0.3 years. The highest number of blood donors (59%) were laborers $p \leq 0.001$.

CONCLUSION: Sociodemographic factors, like the behavior of the blood donors, educational level, professional status, and awareness of blood donation criteria, greatly influence blood donations.

KEYWORDS: Blood Donation, Blood grouping, Blood Transfusion-associated adverse reactions.

INTRODUCTION

Ranking key lifesaving interventions, blood donation, and safe transfusion are considered a remarkable contribution to minimizing life insecurity. The global estimates declare that blood donation and safe transfusion-related interventions result in saving around 4.5 million Americans from death annually [1-3]. There is a huge difference in blood donation and blood transfusion demand in developing countries like Pakistan. However, the annual blood transfusion demand in Pakistan has increased up to 1.5 million bags and the blood donation ratio is still less than one percent [4-5]. Pakistan is considered the highest thalassemia and anemia burden country in the world with 100,000 blood transfusion-dependent patients. The relative estimates suggest that 90 % of blood donations come from patient relatives (volunteer donors) and only 10 % from professional blood donors[1-4]. The comparative assessment of blood donation disparity

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in European countries and Pakistan revealed that lack of awareness, knowledge, donor hemovigilance, common myths related to donation, and organ donation reaction are major factors limiting blood donation in Pakistan[6]. Secondly, in developed countries, the ratio of male to female blood donation is almost equal, except in Italy, where 70 % of blood donations come from males [7-9].

Similarly, a Nigerian study reiterated the major reasons for blood shortage in developing countries which include gender disparity in blood donation versus blood transfusion statistics. In a retrospective study, the author acknowledged that only 0.3 % of female blood donors donate their blood in northwest Nigeria, where the female blood recipient ratio was recorded as 56 % leading to a blood shortage crisis [10]. Intriguingly, similar statistics were reported from Pakistan in the past few years, where fear to donate blood, ignorance, and attitude toward a decline in blood donation, specifically among women blood donors are heightened [11].

Lack of knowledge regarding gender-specific blood donation criteria among the non-medical community is characterized as a major hurdle toward gender disparity in blood donation [12]. Researchers affirmed that launching formal training, awareness campaigns, and making significant progress in research focusing on gender-balanced blood donations could be a possible intervention to achieve blood transfusion sustainability [13-14]. In this study, we aim to assess the common myths associated with the decline in blood donations at the local level in Punjab, Pakistan.

METHODOLOGY

The current retrospective was designed at the Centre for Human Genetics, Hazara University Mansehra, and conducted at District Head Quarter Hospital (DHQ) Attock, Punjab Pakistan, from 10th May 2021 up to 31st December 2021. The study was carried out after institutional ethical approval (No.350/Dispatch/Pathology), and participant consent was taken for volunteer blood donation and participation in the subject research. Sociodemographic data of the blood donors were recorded on pre-designed questionnaires, and laboratory outcomes were noted after donor screening and blood group testing as well. The standard protocol for donor screening and blood group testing was ensured by the kit method. To ensues safe blood donation, donors were tested for Hepatitis C virus (HCV), Hepatitis B virus (HBsAg), HIV, syphilis, and malaria as well. The comparative dichotomous data analysis statistical approach was followed for the distribution of blood groups among blood donors, screening outcomes, and professions in parallel with gender ratio related data were quantitatively categorized into categorical variables by using the Chi-Square test and Fisher's Exact test. Further, data analysis was done by using SPSS version 21.0.

RESULTS

By following the convenient sampling technique, about 680 blood donors were enrolled in the study. Total 79 cases failed to meet the minimum criteria for blood donation after screening. About 41 (51.90) %) potential blood donors were rejected for the donation because of low hemoglobin content (<12.5 g/dl),16 (20.25%) of HCV cases, and 19(24.05%) were malaria positive, respectively (Table-II). A total of 601 healthy and 79 diseased blood donors were belonging from five adjacent areas of Attock, Punjab Pakistan. 547(91%) of healthy blood donors had Rh+Ve blood group, while only 54(9%) had Rh-Ve blood group. Blood group-A and O were found most in the study population. Intriguingly, a huge difference in gender specific blood donors was recorded. The female blood donor's ratio was recorded only 6(1%), where 595(99 %) blood donations were recorded from healthy male donors. All the 601 healthy blood donors were recorded as volunteers and unpaid belonging from different professions. The highest blood donors 374(62%) were belonging from 16-30-year age group, whereas only 5(1%) blood donors from the 40-60-year age group (Table-I). The mean age of blood donors was recorded as 28.3±0.3 years.

Table-I: Blood Donor Demographic Characteristics.

Characteristics n(%)		Healthy Blood Donors n= 601	Diseased Blood Donors n= 79	Total n= 680	Chi-square/ Fisher's Exact Test	P-Value
Blood Groups	A	325(54)	39(49.37)	364		
	B	32(5)	12(15.19)	44		
	AB	50(8)	7(8.86)	57	11.53	0.009
	O	194(32)	21(26.58)	215		
	RH -ve	54(9)	25(31.65)	79	34.9	<0.001
	RH +ve	547(91)	54(68.35)	601		
Age Groups (years)	16y-30 y	374(62)	49(62.03)	423		
	31-45 y	222(37)	29(36.71)	251	0.1504	0.927
	46-60 y	5(1)	1(1.27)	6		
Gender	Female	6(1)	2(2.53)	8		
	Male	595(99)	77(97.47)	672	1.41	0.234
	Total	601(100)	79(100.00)	680		

The comparative inter-city donation rate was found greater rather than intra-city blood donation. Most of the blood donors 311(52.3) % were belonging to Attock, including two female blood donors. The higher odd ratio between male and female blood donors suggests a huge gender disparity in blood donation trends. The standard mantel-Haenszel model statistical analysis approach was adopted for the overall odd ratio assessment for each group (Table-III). The higher chi-square (4.66) reveals an increased difference in gender-wise blood donation. The higher I^2 = 14 % value further assure p-value significance ($p<0.001$) at 95 % confidence interval. The $p<0.001$ suggests that the null hypothesis was rejected, and a significant disparity in blood donation among healthy male and female blood donors was recorded.

The comparative assessment of educational status of blood donors from both group (healthy and diseased) 323(47.5%) blood donors were from middle level education, 134(19.7 %) higher secondary and 70(10.2 %) either completed their undergraduate or postgraduate education respectively. Similarly, 415(61%) of blood donors were associated with daily wages and labor profession in the private sector, 40(5.8%) enrolled students in private institutions and 16(2.3%) government servant respectively (Table-IV).

Table-II: Ratio Screening Testing Positive Blood donors.

Screening Test	Screening positive Donor n (%)
HB Level <12.5 g/Dl	41(51.90)
HCV	16(20.25)
HBsAg	2(2.53)
HIV	0
Syphilis	1(1.27)
Malaria	19(24.05)
Total	79(100.00)

Table-III: Comparative Inter-city versus intra-city healthy blood donor's assessment.

Geographical Area	Gender		Total	Odds Ratio [M-H, Random, CI, 95 % CI]
	Male Donor	Female		
Hassan abdal	35(5.9)	1(16.7)	36(6)	1225.00 [73.67, 20370.07]
Attock	311(52.3)	2(33.3)	313(52.1)	24024.75 [3362.92, 171633.42]
Sanjwal	63(10.6)	1(16.7)	64(10.6)	3969.00 [242.88, 64860.17]
Hazro	144(24.2)	1(16.7)	145(24.1)	20736.00 [1284.61, 334717.42]
Kamra	42(7.1)	1(16.7)	43(7.2)	1764.00 [106.78, 29142.43]
Total (95% CI)	595(100)	6(100)	601(100)	6582.53 [1902.61, 22773.81]
Heterogeneity: Tau^2 = 0.29; Chi 2=4.66, Df=4 (p=0.32); I^2=14 %, Test for overall effect: Z=13.88 (p<0.001)				
Heterogeneity = The overall deviation in retrospective study methodology.				
I^2 = Represents the intra-city variation in blood donors.				
OR= Odd ratio represents the relationship between male and female blood donors.				
Z=Mean blood donation scores.				
p<0.001 = Null hypothesis was rejected.				

Table-IV: Socio-demographic characteristics of blood donors.

Educational Status	Healthy Blood Donors n= 601	Diseased Blood Donors n= 79	Total	Chi-square/ Fisher's Exact Test	p-value
Under-Graduate and Post Graduate level	67 (11.1%)	3 (3.8%)	70		
Higher Secondary level	121 (20.1%)	13 (16.4%)	134	5.8404	0.21
Middle level	278 (46.2%)	45 (57.0%)	323		
Primary Level	84 (14%)	11 (14%)	95		
Illiterate	51 (8.5%)	7 (8.8%)	58		
Donor Profession					
Labor	384 (63.9%)	31 (39.2%)	415		
Shopkeeper	78 (13.0%)	20 (25.3%)	98	23.8	<0.001
Driver	88 (14.6)	23 (29.1%)	111		
Student	36 (6.0%)	4 (5.1%)	40		
Government Servant	15 (2.5%)	1 (1.3%)	16		
Total	601 (100%)	79(100)	680		

DISCUSSION

Heightened demand for blood and insufficient blood donations are considered routine challenges at local healthcare institutes. The lack of a centralized blood banking system, awareness, social, educational, and professional barriers, and unequal blood donations in Pakistan, makes it difficult for the local hospitals to ensure on-time blood provision, which ultimately ends in patient death [1-2]. Pakistan is declared a world-first country with the highest anemia and thalassemia cases requiring regular blood donations [1-4].

Our study indicates that the identification of healthy donors and donor hemovigilance is the preliminary measure of safe blood transfusion. Upon screening testing, we found a 2.3 % prevalence of HCV, 0.3 % HBV and no cases of HIV infection. The reason for zero HIV infection may include a strict adaptation of social, cultural, and religious norms [15]. In our study 99 % of the included blood donors were male and only 1% were females. The major reasons include females are not encouraged to donate blood, exemption from blood donation because of anemia, menstrual cycle, pregnancy, and breastfeeding [15]. Where our outcomes are inconsistent with the previously reported studies unveiling a non-significant gender gap in blood donation [16-17].

Similarly, Alla J et al. reported an equal blood donation ratio in both genders among developed nations [10]. We found 423 (62.2 %) blood donors were belonging to the age range of 16-30 years of age and 251 (37 %) from the age range of 31-45 years of age. Our study outcomes match with a recent study from Japan highlighting blood donors with ages ranging from 20-30 years as the backbone of meeting Japanese blood supply demand [17]. We found a significant decline in blood donation trends while moving from middle education level towards higher education. This may include a lack of awareness regarding social responsibilities, moral values, motivation, and fear of prick among blood donors as well [18].

A previous study led by Lemmens et al. acknowledged no role of educational status in blood donation. Whereas in the modern era of social well-being, we found only 10 % of blood donors were belonging to higher education backgrounds. The highest number of blood donors (61 %) were associated with the labor profession in the private sector. This may be due to their strong bodily physique, motivation, or obedience to following socio-moral values saving important lives [19]. The significant decline in blood donors (2%) associated with the government sector demands extensive policy reforms to ensure social corporate responsibilities at both government level & educational level [20,21]. Policy reforms in the developed world like organizing awareness campaigns, standardizing donation criteria, and additional benefits to the blood donors have proven enhanced blood donation trends to overcome blood inadequacy locally.

CONCLUSION

The lack of policies, knowledge, and understanding regarding the importance of blood donation are the contributing factors to inadequate blood supply at the local level. Making policy reforms, organizing awareness seminars, and highlighting the potential benefits of blood donation can help future generations to meet the 1.5 million blood bags annual blood requirements of the country.

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REFERENCES:

1. Sohail S, Fatima K, Riaz N. Knowledge, attitude and practice of final year medical students regarding thalassemia major. Rawal Medical Journal. 2020;45(2):461-465.
2. Naqvi SG, Qadeer R, Naseeb U, Shahid R. Assessment of Knowledge of Medical Students Regarding Female as Under Represented Group of Blood Donors. Journal of Saidu Medical College, Swat. 2019;9(2). Doi: 10.52206/jsmc.2019.9.2.%25p
3. World Health Organization. Universal access to safe blood transfusion. World Health Organization; 2008 [Cited 2021 May 28]. Available from: URL: http://www.who.int/bloodsafety/publications/UniversalAccesstoSafeBT.pdf.
4. To L, Dunnington T, Thomas C, Love K, McCullough J, Riley W. The United States' potential blood donor pool: updating the prevalence of donor-exclusion factors on the pool of potential donors. Transfusion. 2020;60(1):206-215.
5. World Health Organization. Progress report on implementation of the regional strategic framework for blood safety and availability 2016–2025. World Health Organization. Regional Office for the Eastern Mediterranean. 2020.
6. Qasim M. The news. Blood donation rate in Pakistan needs to be increased; 2015 [Cited 2021 May 28]. Available from: URL: http://www.thenews.com.pk/print/45796-blood-donation-rate-in-pakistan-needs-to-be-increased.
7. Daud M, Sajid Z, Ali T. Knowledge and attitude regarding stem cell research and its application among medical students in Pakistan. BioRxiv. 2020. Doi: 10.1101/2020.08.24.264838
8. Mahfouz MS, Ryani M, Hamzi AS, Zaeri DA, Dahdoh AA, Almalki AJ, et al. Blood donation among university students: practices, motivations, and barriers in Saudi Arabia. Avicenna Journal of Medicine. 2021;11(02):70-76. Doi: 10.4103/ajm.ajm_113_20

9. Ahmed A, Saqlain M, Tanveer M, Tahir AH, Ud-Din F, Shinwari MI, et al. Knowledge, attitude and perceptions about Crimean Congo Haemorrhagic Fever (CCHF) among occupationally high-risk healthcare professionals of Pakistan. BMC Infectious Diseases. 2021;21(1):1-9. Doi:10.1186/s12879-020-05714-z
10. Alla J, Muhammad Y, Habeeb A, Mustapha A, Andrew C, Saeed S. Gender distribution of blood donors and blood recipients in rasheed shekoni teaching hospital dutse, Jigawa state, Nigeria. International Journal of Scientific Research and Engineering Development. 2019;2(1):20-24.
11. Javaeed A, Kousar R, Farooq A, Hina S, Ghauri SK, Tabbasum T. Knowledge, attitude, and practice of blood donation among undergraduate medical students in Azad Kashmir. Cureus. 2020;12(4). Doi:10.7759/cureus.7733
12. Kowsalya V, Vijayakumar R, Chidambaram R, Srikumar R, Reddy EP, Latha S, et al. A study on knowledge, attitude and practice regarding voluntary blood donation among medical students in Puducherry, India. Pakistan Journal of Biological Sciences: PJBS. 2013;16(9):439-442. Doi: 10.3923/pjbs.2013.439.442
13. Casal-Otero L, Marques E, Martínez-Santos AE, Rodríguez-González R, Fernández-de-la-Iglesia JD. Knowledge of Portuguese nursing students about blood donation. Acta Paulista de Enfermagem. 2020;33. Doi:10.37689/acta-ape/2020AO0166
14. Papagiannis D, Rachiotis G, Symvoulakis EK, Anyfantakis D, Douvlataniotis K, Zilidis C, et al. Blood donation knowledge and attitudes among undergraduate health science students: A cross-sectional study. Transfusion and Apheresis Science. 2016;54(2):303-308. Doi:10.1016/j.transci.2015.11.001
15. Japhet MO. Transfusion-transmissible viral pathogens among blood donors in Ibadan, Nigeria. Ife Journal of Science. 2020;22(2):251-256. Doi: 10.4314/ijs.v22i2.22
16. Okafor AC, Dan-Jumbo A, Omunakwe HE, Lawson SD. Transfusion Transmissible Infections among Voluntary Blood Donors in Port-Harcourt Metropolis, Rivers State, Nigeria. International Journal of Environment, Agriculture and Biotechnology. 2021;6:1. Doi: 10.22161/ijeab
17. Tigabu A, Engda T, Mekonnen F. Seroprevalence of transfusion transmissible viral infections (HIV, HBV and HCV) among voluntary blood donors at University of Gondar Comprehensive Specialized Hospital, Gondar; Northwest Ethiopia. BMC Infectious Diseases. 2019;19(1):1-8.
18. Akita T, Tanaka J, Ohisa M, Sugiyama A, Nishida K, Inoue S, et al. Predicting future blood supply and demand in Japan with a Markov model: application to the sex-and age-specific probability of blood donation. Transfusion. 2016;56(11):2750-2759.
19. Lemmens KP, Abraham C, Ruiter RA, Veldhuizen IJ, Dehing CJ, Bos AE, et al. Modelling antecedents of blood donation motivation among non-donors of varying age and education. British Journal of Psychology. 2009;100(1):71-90. Doi.org/10.1348/000712608X310237
20. Hong JM, Lee WN. The -stages-of-change approach for prosocial behavior: Message tailoring to encourage blood donation. Journal of Applied Social Psychology. 2021;51(3):219-236. Doi:10.1111/jasp.12727
21. Tariq S, Jawed S. Knowledge and attitude of blood donation among female medical students in Faisalabad. JPMA. The Journal of the Pakistan Medical Association. 2018;68(1):65-70.

Author's Contribution:

Naeem Bukhari: Study design, questionnaire design, drafting and editing.
Nadeem Sharif: Data collection, and data analysis.
Aaqib Ali: Formulating inclusion and exclusion criteria, editing.
Abdul Majid: Manuscript write up, and final editing.
Wali Ur Rehman: Drafting the work or revising it critically for important intellectual content.
Inam-u-llah: Substantial contributions to the conception or design of the work.

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