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Original Article

Exploring Blood Donation: Perspectives among Undergraduate Students in Peshawar, Pakistan

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ABSTRACT

To improve voluntary donation and public health in the face of Pakistan's shifting regulations and challenges, it is crucial to comprehend the blood donation patterns of undergraduate students in Peshawar. **Objective:** To compare and assess undergraduate students in medical, allied health sciences, and non-medical fields in Peshawar, Pakistan, on their knowledge, attitudes, barriers to, and motivations for, blood donation. **Methods:** An eight-month observational cross-sectional study with 1232 undergraduate students from various academic fields was conducted. Participants were assessed through a comprehensive questionnaire regarding blood donation. Data were analyzed using SPSS version 27.0, employing descriptive statistics and the chi-square test. **Results:** The study enrolled 1232 undergraduate students, with 65.2% male and 34.6% female participants. Among them, 82.3% were aware of their blood group. While 24.74% exhibited poor knowledge about blood donation, 62.98% demonstrated moderate knowledge, and 12.29% had good knowledge. Additionally, 39.9% had never donated blood, but 83.9% expressed willingness to donate in the future. Fear of needles (13.90%), fear of infection (13.20%), and medical unfitness (13.10%) were significant barriers, while motivations included saving lives (22.20%), helping friends and family (19.40%), and moral obligation (14.80%). **Conclusions:** The study concluded that undergraduate students in Peshawar possess a moderate level of understanding regarding blood donation, with medical students showing higher knowledge levels. Despite variations across disciplines, positive attitudes towards donation were common, indicating potential for increased voluntary donation.

INTRODUCTION

Blood donation and transfusion practices in Pakistan are less developed compared to global standards, with around 170 public and 450 private, mostly hospital-based, blood banks [1]. The country's low human development index reflects a lack of a reliable blood service system, similar to other underdeveloped regions [2, 3]. There is a significant gap between the demand for and availability of blood due to a shortage of regular donors [3]. Safety concerns, particularly regarding transfusion transmissible diseases, are also critical in underdeveloped nations like Pakistan [4]. Voluntary donors, who represent only 10% of donors in Pakistan, are crucial for supplying safe, high-quality blood, whereas 90% of donations come from replacement or paid donors. Women, nearly half the population, are notably underrepresented in blood donation statistics [1, 4, 5]. Studies show widespread misconceptions and varying attitudes towards blood donation, alongside reasons for not donating such as lack of awareness, family disapproval, and fear of pain or side effects [6-8]. Contrarily, incentives like free health checks or gifts can encourage voluntary donations [9]. Despite limited research, physically fit university students could be key potential donors [10]. The rationale for this study underscores the urgent necessity to comprehend the knowledge, attitudes, barriers, and motivational factors influencing voluntary blood donation among undergraduate students in Peshawar, Pakistan.

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This study aimed to inform evidence-based strategies that promote altruism and improve public health outcomes in the community.

METHODS

The study utilized a comparative observational cross-sectional method in Peshawar, Khyber Pakhtunkhwa, Pakistan from May to December 2023. A total of 1250 questionnaires were distributed to achieve a target sample of 1082 participants, calculated using the Open Epi Sample Size Calculator with a 99.9% confidence level and a 5% confidence limit. Out of these, 1232 were returned completed. Participants included 496 medical, 385 non-medical, and 351 allied health sciences students, selected via a convenient non-random method. Inclusion criteria were students enrolled in relevant undergraduate programs, excluding non-enrolled, non-consenting, or those submitting incomplete questionnaires. Confidentiality and verbal consent were ensured, with ethics approval from the Northwest School of Medicine's Institutional Review Board (IRB) (Reference No: EC/2023-SM/064, dated: 20th March, 2023). Data were gathered using a standardized questionnaire covering demographics, knowledge, attitudes, barriers, and motivations related to blood donation and analyzed using SPSS version 27.0, employing descriptive statistics and the chi-square test to assess relationships across disciplines, with a significance level of 0.05. Knowledge scores ranged from (0-12), categorized into poor (0-4), moderate (5-8), and good (9-12).

RESULTS

1232 people from 385 non-medical, 496 medical, and 351 allied health science fields were polled for the study. The participants were aged 18 to 30 (average age 21.39 ± 2.098), with 34.6% being female and 65.2% being male. 45.1% of the institutional distribution was private and 54.7% was public. Most students (70.2%) had junior status academically, and 82.3% knew their blood type. Among those who knew, the blood group breakdown was comprised of 236 A+, 43 A-, 279 B+, 50 B-, 132 O+, 30 O-, 193 AB+, and 54 AB-(Table 1).

Table 1: Demographics of the Participants

Variables	Medical (%)	Non-Medical (%)	Allied Health Sciences (%)	Total (%)
Male	295 (36.6)	273 (33.9)	237 (29.4)	805 (100)
Female	201 (47.1)	112 (26.2)	114 (26.7)	427 (100)
Private	312 (56)	199 (35.7)	46 (8.3)	557 (100)
Public	184 (27.3)	186 (27.6)	305 (45.2)	675 (100)
Junior Year	344 (39.7)	254 (29.3)	269 (31)	867 (100)
Senior Year	152 (41.6)	131 (35.9)	82 (22.5)	365 (100)
Urban	360 (48.5)	182 (24.5)	201 (27.1)	743 (100)
Rural	136 (27.8)	203 (41.5)	150 (30.7)	489 (100)
Do you know your Blood Group?				
Yes	455 (44.7)	292 (28.7)	270 (26.5)	1017 (100)
No	41 (19.1)	93 (43.3)	81 (37.7)	215 (100)
Total	496 (40.3)	385 (31.3)	351 (28.5)	1232 (100)

Table 2 demonstrates in detail the knowledge of the participants regarding blood donation, along with the chi-square and p-values for each corresponding variable.

Table 2: Knowledge of the Participants Regarding Blood Donation

Variables	Medical (%)	Non-Medical (%)	Allied Health Sciences (%)	Total (%)	P-Value	X^2-Value
Can a person be infected by receiving Blood Donation?						
Yes	426 (46.7)	295 (32.3)	192 (21)	913 (100)	0.000	108.233
No	51 (19.9)	75 (29.3)	130 (50.8)	256 (100)		
Don't Know	19 (30.2)	15 (23.8)	29 (46)	63 (100)		
Can Individuals with infectious diseases donate blood?						
Yes	69 (26.4)	108 (41.4)	84 (32.2)	261 (100)	0.000	76.669
No	414 (47.1)	248 (28.2)	217 (24.7)	879 (100)		
Don't Know	13 (14.1)	29 (31.5)	50 (54.3)	92 (100)		
How often can an individual donate blood?						
Weekly	7 (15.9)	16 (36.4)	21 (47.7)	44 (100)	0.000	169.033
Monthly	37 (48.7)	16 (21.1)	23 (30.3)	76 (100)		
3 Months	284 (49.9)	101 (17.8)	184 (32.3)	569 (100)		
6 Months	115 (36.3)	112 (35.3)	90 (28.4)	317 (100)		
Annually	17 (27.9)	35 (57.4)	9 (14.8)	61 (100)		
Don't Know	36 (21.8)	105 (63.6)	24 (1.5)	165 (100)		
What do you think is the minimum age limit for blood donation?						
16 Years	94 (27.6)	119 (35)	127 (37.4)	340 (100)	0.000	38.544
18 Years	336 (45.5)	209 (28.3)	193 (26.2)	738 (100)		
20 Years	66 (42.9)	57 (37)	31 (20.1)	154 (100)		
What do you think is the maximum age limit for blood donation?						
55 Years	347 (37.1)	307 (32.8)	281 (30.1)	935 (100)	0.001	17.868
65 Years	125 (51.7)	64 (26.4)	53 (21.9)	242 (100)		
75 Years	23 (42.6)	14 (25.9)	17 (31.5)	54 (100)		
What volume of blood is collected during each donation?						
500ml	292 (43.1)	174 (25.7)	211 (31.2)	677 (100)	0.001	60.539
Upto 1000ml	102 (34.5)	88 (29.7)	106 (35.8)	296 (100)		
Don't Know	102 (39.5)	122 (47.3)	34 (13.2)	258 (100)		
What is the duration of donation process?						
<20 min	213 (37.3)	185 (32.4)	173 (30.3)	571 (100)	0.000	47.638
20-60 min	173 (44.8)	81 (21)	132 (34.2)	386 (100)		
Don't Know	110 (40)	119 (43.3)	46 (16.7)	275 (100)		
Minimum weight for blood donation?						
50kg	286 (43.7)	151 (23.1)	218 (33.3)	655 (100)	0.000	47.056
70kg	185 (36.5)	209 (41.2)	113 (22.3)	507 (100)		
100kg	24 (34.8)	25 (36.2)	20 (29)	69 (100)		
Minimum Hemoglobin for male donor?						
11.5g/dl	45 (26.5)	36 (21.2)	89 (52.4)	170 (100)	0.000	294.820
12.5g/dl	168 (35.1)	169 (35.3)	142 (29.6)	479 (100)		
13.5g/dl	247 (61.4)	48 (11.9)	107 (26.6)	402 (100)		
Don't Know	36 (19.9)	132 (72.9)	13 (7.2)	181 (100)		

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Minimum Hemoglobin for female donor?						
11.5g/dl	158 (41.7)	94 (24.8)	127 (33.5)	379 (100)	0.000	178.247
12.5g/dl	211 (44.6)	103 (21.8)	159 (33.6)	473 (100)		
13.5g/dl	72 (48)	33 (22)	45 (30)	150 (100)		
Don't Know	55 (23.9)	155 (67.4)	20 (8.7)	230 (100)		
Which Blood type is universal donor?						
A	8 (6.5)	104 (84.6)	11 (8.9)	123 (100)	0.000	243.029
B	10 (18.9)	35 (66)	8 (15.1)	53 (100)		
AB	18 (24.3)	32 (43.2)	24 (32.4)	74 (100)		
O	460 (46.8)	214 (21.8)	308 (31.4)	982 (100)		
Which blood type is universal recipient?						
A	8 (7.4)	79 (73.1)	21 (19.4)	108 (100)	0.000	421.077
B	13 (16.9)	55 (71.4)	9 (11.7)	77 (100)		
AB	458 (52.5)	123 (14.1)	292 (33.4)	873 (100)		
O	17 (9.8)	128 (73.6)	29 (16.7)	174 (100)		

Figure 1 data showcases that among the participants, 24.74% exhibited a poor level of knowledge regarding blood donation. 62.98%, demonstrated a moderate level of knowledge on the subject. While a smaller yet notable portion of the participants, amounting to 12.29%, showed a good level of knowledge regarding blood donation.

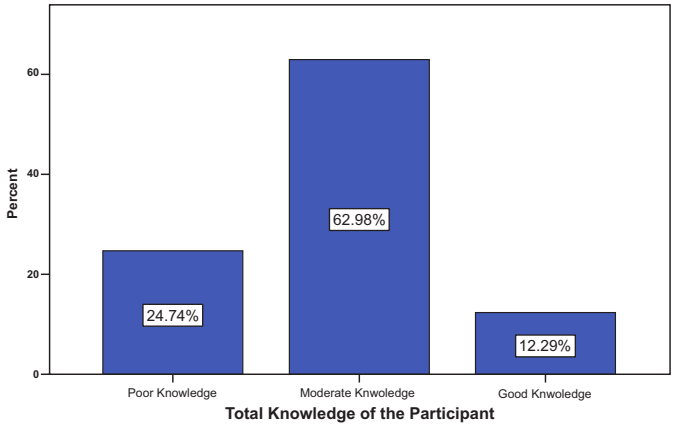

Figure 1: Total Knowledge of the Participants

Comparison of attitudes towards blood donation among participants from medical, non-medical, and allied health sciences backgrounds, including corresponding chi-square values and p-values for each variable, is presented in table 3.

Table 3: Attitude of Participants towards Blood Donation

Variables	Medical (%)	Non-Medical (%)	Allied Health Sciences (%)	Total (%)	P-Value	X^2-Value
Do you believe the best way to donate blood is at the request of relatives?						
Agree	243 (34.4)	227 (32.1)	237 (33.5)	707 (100)	0.000	29.426
Disagree	253 (48.2)	158 (30.1)	114 (21.8)	525 (100)		
Do you think that the best way to donate blood is through paid donations?						
Agree	120 (29.1)	142 (34.5)	150 (36.4)	412 (100)	0.000	34.727
Disagree	376 (45.9)	243 (29.6)	201 (24.5)	820 (100)		
Do you think people who donate blood should receive something in exchange?						
Agree	120 (29.1)	142 (34.5)	150 (36.4)	412 (100)	0.000	34.727
Disagree	376 (45.9)	243 (29.6)	201 (24.5)	820 (100)		
Do you believe people who donate blood can contract diseases?						
Agree	233 (41.6)	148 (26.4)	179 (32)	560 (100)	0.002	12.449
Disagree	263 (39.1)	237 (35.3)	172 (25.6)	672 (100)		
Do you think people who donate blood become temporarily weakened?						
Agree	297 (46)	156 (24.2)	192 (29.8)	645 (100)	0.000	33.651
Disagree	199 (33.9)	229 (39)	159 (27.1)	587 (100)		
Do you donate blood to get free investigation?						
Agree	202 (33.3)	174 (28.7)	230 (38)	606 (100)	0.000	54.159
Disagree	294 (47)	211 (33.7)	121 (19.3)	626 (100)		
Do you think blood donation saves lives?						
Agree	433 (42.8)	302 (29.9)	276 (27.3)	1011 (100)	0.000	15.472
Disagree	63 (28.5)	83 (37.6)	75 (33.9)	221 (100)		
Do you consider blood donation a moral activity?						
Agree	415 (41.7)	308 (30.9)	273 (27.4)	996 (100)	0.088	4.865
Disagree	81 (34.3)	77 (32.6)	78 (33.1)	236 (100)		
Do you think young people should donate blood more frequently than older individuals?						
Agree	406 (41.7)	300 (30.8)	267 (27.4)	973 (100)	0.104	4.521
Disagree	90 (34.7)	85 (32.8)	84 (32.4)	259 (100)		
Do you believe people with knowledge donate more often?						
Agree	352 (42.5)	256 (30.9)	221 (26.7)	828 (100)	0.046	6.145
Disagree	144 (35.7)	129 (32)	130 (32.2)	403 (100)		
Do you think the best way to donate blood is through voluntary unpaid methods?						
Agree	378 (45.1)	204 (24.3)	257 (30.6)	839 (100)	0.000	59.729
Disagree	118 (30)	181 (46.1)	94 (23.9)	393 (100)		
Prior to blood donation, should individuals truthfully disclose their health status?						
Agree	424 (47.5)	235 (26.3)	233 (26.1)	892 (100)	0.000	73.727
Disagree	72 (21.2)	150 (44.1)	118 (34.7)	340 (100)		
Have you ever donated blood before?						
Yes	261 (52.9)	125 (25.4)	107 (21.7)	493 (100)	0.000	55.256
No	235 (31.8)	260 (35.2)	244 (33)	739 (100)		
Are you currently fit to donate blood?						
Yes	182 (56)	75 (32.1)	68 (20.9)	325 (100)	0.000	45.476
No	314 (34.6)	310 (34.2)	283 (31.2)	907 (100)		
Would you consider donating blood in future?						
Yes	86 (43.9)	58 (29.6)	52 (26.5)	196 (100)	0.528	1.277
No	410 (39.6)	327 (31.6)	299 (28.9)	1036 (100)		
Are you afraid of needles?						
Yes	325 (43.7)	231 (31)	188 (25.3)	744 (100)	0.002	12.333
No	171 (35)	154 (31.6)	163 (33.4)	488 (100)		
Do you feel apprehensive about learning your blood profile results during donation?						
Yes	337 (46.2)	218 (29.9)	175 (24)	730 (100)	0.000	28.875
No	160 (31.9)	166 (33.1)	176 (35.1)	502 (100)		
Is it possible for donated blood to be sold?						
Yes	233 (41.2)	211 (37.3)	122 (21.6)	566 (100)	0.000	30.070
No	263 (39.5)	174 (26.1)	229 (34.4)	666 (100)		
Have you encouraged anyone to donate blood?						
Yes	154 (47.8)	84 (26.1)	84 (26.1)	322 (100)	0.005	10.802
No	342 (37.6)	301 (33.1)	267 (29.3)	910 (100)		

The study identified barriers to blood donation, including fear of needles (13.90%), fear of infection (13.20%), and medical unfitness (13.10%). Parental restrictions affected

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12.10%, dissatisfaction with preventive measures and uncertainty about donation locations were cited by 10.10% and 9.60%, respectively. Findings are summarized in figure2.

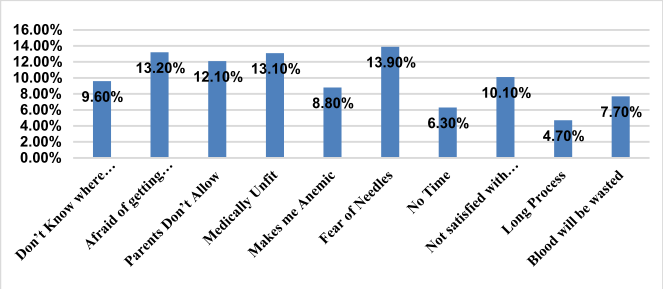

Figure 2: Barriers towards Blood Donations

The study found that 22.10% donated blood to save lives, 19.40% to help friends and family, and 17.20% for self-satisfaction. Figure 3; illustrate the varied motivations behind blood donation.

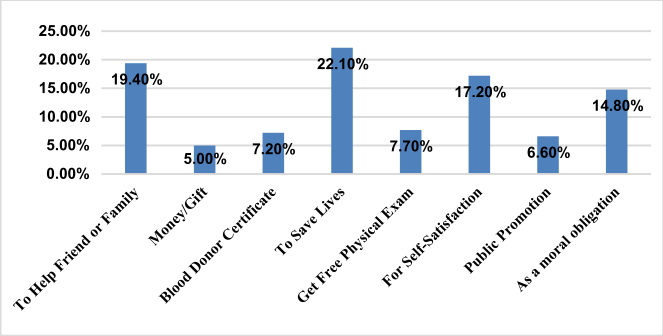

Figure 3: Motivational Factors towards Blood Donation

DISCUSSION

Our research involved 1232 students from diverse academic backgrounds and colleges in Peshawar. The rate of blood donation among these students was 59.8%, which aligned with a separate study conducted in Bangladesh involving 201 students, where the frequency was recorded at 50.74%. Additionally, within the same study, it was observed that male students exhibited a higher frequency of blood donation, approximately 80.39% in Bangladesh and 70.9% in our study [11]. Likewise, in a national study conducted in Faisalabad, obstacles to blood donation were identified, and these barriers were consistent with those revealed in our own study. They encompassed concerns such as fear, limited proximity to collection facilities, time constraints, and a shared motivating factor centered on the desire to save lives [12]. Similarly, in another study conducted with students in Nigeria, there was a higher level of knowledge concerning blood donation compared to our study. For example, 86.7% of Nigerian students were aware that 500ml of blood is typically taken during each donation, whereas only 54.8% of our students had this understanding. This indicates the importance of raising awareness among our student population. Furthermore, both Nigerian and Pakistani students displayed positive attitudes and eagerness towards participating in blood donation in the future [13]. The same findings of low level of knowledge and a positive attitude were also found in another study conducted in Malaysia [14]. Another study from North India involving 235 students concluded that the mean overall knowledge score was 74.4% with 95.7% of the participants aware of their blood group whereas in our study 82.3% of the participants knew their blood types. The same study showed that the practice of blood donation among the students of north India was as low as 22.9% and in another research conducted in Southeast Nigeria 84.7% of the participants had knowledge of their blood groups [15, 16]. A study conducted in Saudi Arabia found that students exhibited a commendable level of understanding regarding blood donations. Concerning motivational factors, one aspect highlighted was the possession of a blood donor certificate, which was reported among 47.8% of Saudi students and only 7.2% of Pakistani students [17]. A study conducted in Iraq revealed a notable gap in knowledge between medical and non-medical students. Despite their positive attitudes, there was a low reported incidence of previous blood transfusions among them [18]. Regarding the practices of blood donation 59.8% of our participants had previously donated blood, while in a study conducted in Egypt the rate of previous blood donations was only 35.1% among the participants, the same rate (34.8%) was also found in a multi centric study of Italy [19, 20].

CONCLUSIONS

The study reveals that Peshawar students have a moderate understanding of blood donation, with medical students showing more knowledge than those in allied health sciences and non-medical fields. Although knowledge levels vary, the overall attitude towards blood donation is positive, and many participants have donated blood before.

Authors Contribution

Conceptualization: SZ, KK, SM
Methodology: SZ, KK, WK, HK, IK
Formal analysis: SZ, KK, MA, WK, HK, IK, SM, JS
Writing, review and editing: SZ, KK, MA, SM, JS

All authors have read and agreed to the published version of the manuscript

Conflicts of Interest

The authors declare no conflict of interest.

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