Original Article

Knowledge, key motivation and obstacles to become COVID-19 convalescent plasma donor among medical students of Rawalpindi Medical University, Pakistan: A cross-sectional study

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Author's Contribution

[1,2] *Conception of study*
[3] *Experimentation/Study conduction*
[1,3,5] *Analysis/Interpretation/Discussion*
[1,2,3,4,5] *Manuscript Writing*
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Abstract

Background: Gaining convalescent plasma from individuals recuperated from COVID-19 with adequate immune response titers is a possible choice for the treatment and anticipation of COVID-19.

Objective: To determine the knowledge, key motivations of donating and causes of not donating convalescent plasma by qualified donors.

Materials and Methods: It is an analytical cross-sectional study. A sample of 347 was collected using the convenience sampling technique. Respondents were asked to fill out questionnaires about their understanding of convalescent plasma, their motives, and hurdles to donation. MBBS students of Rawalpindi medical university were included while students with any chronic disease, COVID-19 infection, immunosuppression, blood-borne diseases, leukemic, thalassemic, and smokers were excluded. Comparative analysis was done using independent T-test and linear regression was applied.

Results: Participants were predominantly females 222 in number (61%) and 57% of respondents were aged between 20-22 years. Knowledge of Convalescent Plasma Donation (CPD) was satisfactory among participants. Knowledge showed positive correlation with the key motivations (r=0.0414, p= 0.000) and negative correlation with the barriers (r=-0.128, p=0.015).

Conclusion: This study indicated that the knowledge of participants regarding convalescent plasma donation (CPD) was satisfactory. Knowledge had a positive impact on motivation for CPD. Barriers to convalescent plasma donation were more common among female participants. Barriers showed a negative correlation with key motivation and knowledge.

Keywords: Barriers, Plasma, Donation.

Introduction

COVID-19 is an infectious disease brought on by a severe respiratory ailment (SARS-CoV-2). In December 2019, its first case was recognized in Wuhan, China. Since then, the disease has spread worldwide, resulting in a pandemic. Globally, there have been 172 million affirmed instances of COVID-19, including 3.7 million deaths announced till now.[1] Currently, the world is going through a time of intense emergency brought about by the COVID-19 pandemic (SARS-CoV-2), which has detrimental effects on practically all everyday issues. The illness caused by this virus produces severe respiratory distress and has a high contagiousness and contamination casualty rate of 0.68%.[2]

The initial findings revealed that exposure to SARS-CoV-2 does not cause sickness in all individuals who come into contact with a specific population and that not all infected individuals experience the symptoms of severe respiratory system inflammation.[3] This variation in disease and illness could be due to the individual's immune system reaction. Therefore, clinically SARS-CoV-2 contamination has been ordered into two classes: gentle and severe.[4] There are many pieces of evidence to accept that the sickness relies upon hereditary inclination that causes various individuals to respond to disease in a particular way.[5] Convalescent plasma and hyperimmune immune-globulin have been shown to reduce mortality in patients with severe respiratory symptoms. In a research study conducted in Chicago, Illinois, it was found that convalescent plasma obtained from patients who recovered from the disease with high titers of killing antibodies is fruitful in treating numerous COVID-19 patients.[6] In another study conducted in China and South Korea, analysts likewise found a helpful impact on clinical markers of COVID-19 after inoculation of convalescent plasma.[7]

Inconvenience and fear were significant hindrances to donating convalescent plasma. Better training efforts to relieve fears about giving and the work environment were considered significant motivators.[8] Moral and civic obligation to assist research, altruism from adversity, patriotism, control, and post-traumatic growth were the main motivations, while key obstacles were worries that others will know of the infection, logistics, not being well enough, fear of reinfection, and lack of trust in institutions.[9]

It has been found that convalescent sera are a safe and proven approach for dealing with SARS-CoV-2.[10] According to a study conducted in Punjab, Pakistan, 55.5% of people believed that plasma donation is similar to blood donation, while 50.9% believed that plasma giving has negative health implications. Among the members in the example, 73.2% had never given blood in any event, for a solitary time frame in their lives.[11] The rise of COVID-19 has reconsidered the value of convalescent plasma donation (CPD). In critically ill patients, convalescent plasma may decrease mortality.[12]

After CPD therapy, almost all of the patients showed a n increase in neutralizing antibody titers and the disap pearance of SARS-CoV-2 RNA.[12] Also, administration of convalescent plasma has a beneficial effect on clinical symptoms. According to the limited scientific evidence, CPT therapy in COVID-19 patients appears to be safe, clinically efficacious, and lowers mortality[13]. The success of potential CP donors' recruitment depends on a better comprehension of mental factors like motivation, barriers, and knowledge of CP donation. Since the episode of the COVID-19 pandemic, huge endeavors have been made all over the planet to observe a successful remedial and preventive estimate that would stop the development of the contamination and the subsequent infection. One of them is the utilization of healing plasma gathered from completely recuperated patients with COVID-19 illness, which is a wellspring of antibodies.[14] Therefore, we intend to obtain information on the conceivable utilization of convalescent plasma (CP) in the treatment of COVID-19 disease and the barriers along with key motivations regarding convalescent plasma donation (CPD) in the younger generation. Creating awareness about CPD and identification of barriers would further lead to overcoming them and will help in achieving a clear path for fulfillment of our objectives. A more critical analysis of young people's perceptions, as well as the intellectual and inspirational processes that influence donor decisions, may help persuade them to donate blood plasma for therapeutic purposes.

Our rationale was to determine the knowledge among young adults regarding plasma donation for the treatment of COVID-19, to know the key motivations that can motivate the adults to donate their plasma, to find out the obstacles in the way of COVID-19 convalescent plasma donation, and to find out the correlation between knowledge, key motivation, and barriers to become COVID-19 convalescent plasma donor.

Materials and Methods

It is an analytical cross-sectional study conducted at Rawalpindi Medical University for the duration of 9 months from March 2021 to November 2021. Medical students of Rawalpindi Medical University (RMU) who recovered from COVID-19 and students who had tested positive for COVID-19 or students having signs and symptoms of the disease were included in the study. Students with any chronic disease (diabetes, hypertension), smokers, taking any immunosuppressive treatment, infected with blood-borne diseases or affected with leukemia and thalassemia were excluded. A sample size of 347 was calculated using the WHO calculator with a confidence interval of 95%, absolute precision of 5% and an expected percentage of depression was 34.3[4]. Samples were selected by using the convenience sampling technique. A validated close-ended questionnaire was used. Nine close ended questions were used to asses knowledge. For key motivation, 3 domains were used. Domain 1 assessed altruism from adversity, domain 2 was related to reluctant altruism while civil moral duty was checked in domain 3. For quantitative variables descriptive statistics were used. For qualitative variables such as knowledge, motivating factors and barriers, frequency and percentages were calculated. Tables, pie, and bar charts have been used to present data. Chi-square with degree of freedom =1, Pearson's correlation and Independent sample T-test were applied to analyze the data. Ethical approval was taken from the Ethical Review Board (ERB) of Rawalpindi Medical University.

Results

A sample of 347 was collected from medical students of Rawalpindi Medical University. Participants were predominantly females 61% (n=221) while males were 39% (n=142) as shown in Figure 1. Figure 2 shows that 57% of the respondents aged between 20-22 years. Figure 3 shows that maximum number of respondents were from Fourth year MBBS (n=156). In our study, there were 9 close ended questions to assess knowledge. Students showed a very high level of knowledge about CPD (Figure 4). Table I shows various domains for key motivations. Domain 1 had a mean score of 7.79 with a standard deviation of ±1.57 and a significant difference was found between males and females with a *p*-value of 0.005. Domain 2 has a mean score of 7.23 with a standard deviation of ±1.41 and a significant difference between males and females was found with a *p*-value of 0.000. Domain 3 has a mean score of 9.13 with a standard deviation of ± 2.69 and a significant difference between males and females with *p*-value of 0.001.

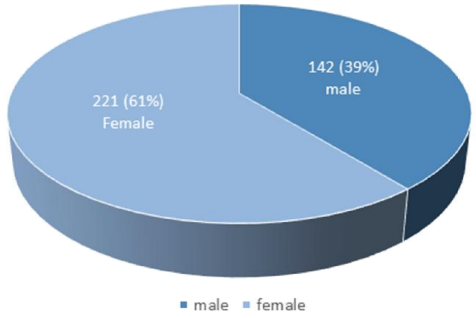

Figure 1: Gender frequency (n=347)

Females faced more barriers, both general and logistic barriers, than males in donating convalescent plasma. (Table II, Table III and Table IV). The association between gender and barriers is given in Table V. Key motivations showed a positive correlation with knowledge (r=0.414, *p*-value of 0.000 and negative correlation with barriers (r=-.065, p=0.128). There were two sections of barriers i.e., general barriers and logistic barriers which showed a very high significant difference in males and females with a *p*-value of 0.000 in most of the barriers while females showed higher barrier rates.

Regarding the correlation between barriers, key motivation and knowledge. Knowledge showed positive correlation with key motivations (r=0.414, *p*=0.000) and negative correlation with barriers (r=-0.128, *p*=0.015). Key motivations showed a positive correlation with knowledge (r=0.414, p=0.000) and negative correlation with barriers (r=-.065, *p*=0.128). Barriers showed a negative correlation with_both key motivation and knowledge.

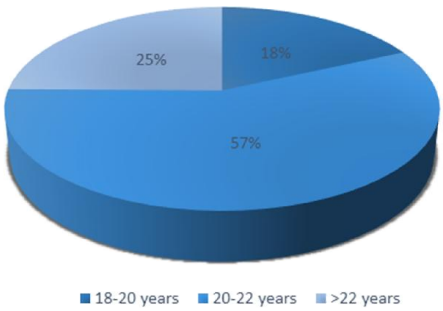

Figure 2: Age-frequency (n=347)

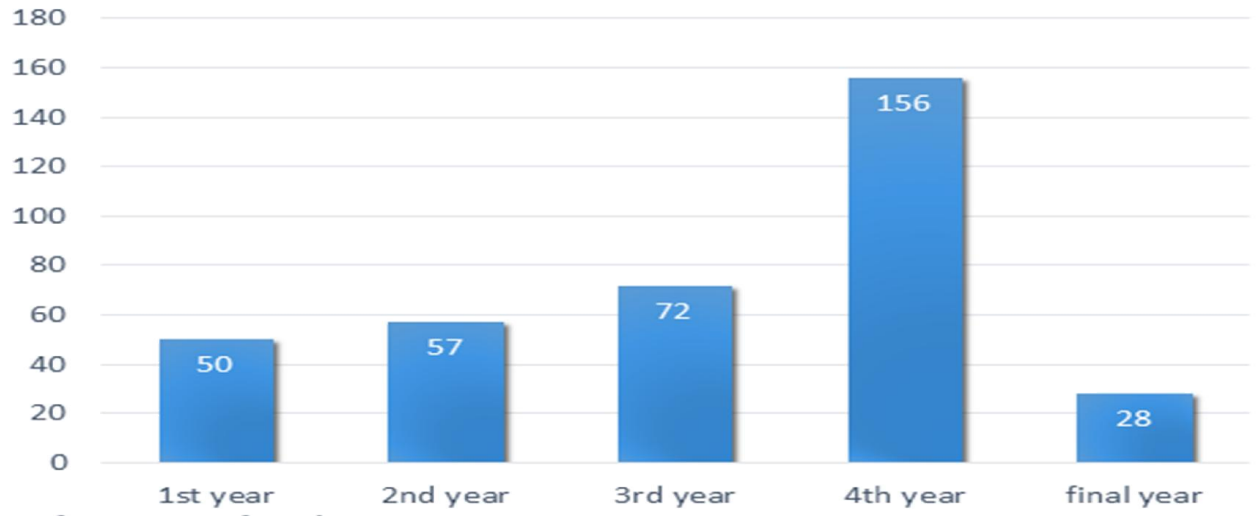

Figure 3: Number of study participants from each year (n=347)

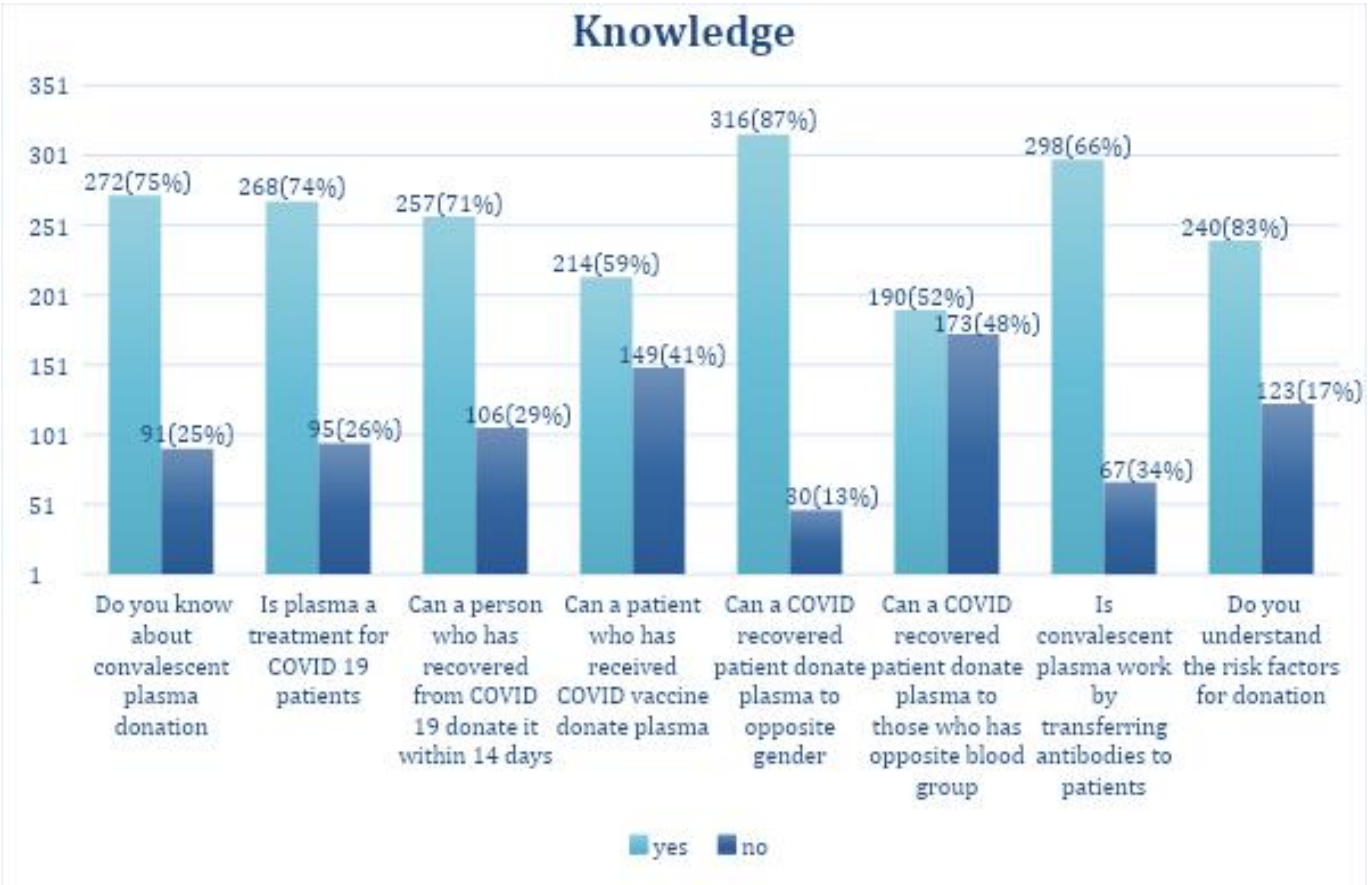

Figure 4: Percentage of knowledge of study participants (n=347)

Table I: Mean score of key motivations and association with gender (n=347)

	Total	Male	Female	P-value
Domain 1 motivation (Signaling reluctant altruism)	7.79±1.57	8.08±1.57	7.61±1.54	.005
Domain 2 motivation (Altruism from adversity and post-traumatic growth)	7.23±1.41	7.64±1.63	6.96±1.63	0.000
Domain 3 motivation (Moral and civil duty, patriotism, and control)	9.13±2.69	9.69±3.21	8.77±2.24	.001

Table II: Gender based frequencies of barriers faced among male and female students (n=347)

Barriers	Total n (%)	Male n (%)	Female n (%)
I will become ill again if I donate convalescent plasma.	120(34.5%)	72(57.6%)	48(21.6%)
I do not really feel well enough to donate convalescent plasma.	142(40.9%)	61(48.8%)	81(36.48%)
Others who are fitter than me can donate convalescent plasma.	208(59.94%)	84(67.2%)	124(55.85%)
I need more time to recover from coronavirus before I could donate.	171(49.2%)	75(60%)	96(43.24%)
I do not like the idea of donating convalescent plasma.	105(30.2%)	56(44.8%)	49(22.07%)
I do not trust the Blood Collection Agencies for donating plasma	120(34.5%)	62(49.6%)	58(26.1%)

Table III: Gender based logistic barriers in convalescent plasma donation (n=347)

Logistic Barriers	n (%)
Involves logistics	151 (43.5%)
Not well to donate plasma	132 (38.0%)
Inconvenient to donate	117 (33.7%)
Logistically difficult	145 (41.7%)

Table IV: Gender based logistic barriers in convalescent plasma donation (n=347)

Logistic Barriers	Male n (%)	Female n (%)
Involves logistics	67 (53.6%)	84 (37.8%)
Not well to donate plasma	61 (48.8%)	71 (31.9%)
Inconvenient to donate	52 (41.6%)	65 (29.2%)
Logistically difficult	67 (53.6%)	68 (30.6%)

Table V: Association of barriers with gender (n=347)

Barriers	χ^2	df	P value
I will become ill again if I donate convalescent plasma.	3.280	1	.000
I do not really feel well enough to donate convalescent plasma.	4.38	1	.036
Others who are fitter than me can donate convalescent plasma.	1.98	1	.371
I need more time to recover from coronavirus before I could donate.	3.051	1	.081
I do not like the idea of donating convalescent plasma.	11.53	1	.000
I do not trust the Blood Collection Agencies for donating plasma	11.85	1	.001
I don't understand that donating convalescent plasma involves logistics	2.995	1	.084
It is just inconvenient to donate	2.056	1	.152
Logistically it is just too difficult to donate convalescent plasma	5.094	1	.024
I have been through enough recently	1.241	1	.265

χ^2 = chi-square, df= degree of freedom

Discussion

Our study shows that medical students possess good knowledge about Convalescent Plasma Donation (CPD). There was a positive correlation between knowledge and donation, however, there was a significant difference among genders as female faced more barriers to donation. The rise of COVID-19 has reconsidered the value of CPD. in critically ill patients, Convalescent Plasma (CP) may decrease mortality.[12]

In our study majority of students had a satisfactory level of knowledge about CPD as shown in Fig 4. A study in Poland concludes that young adults, women, older age respondents, and medical students had a wider range of knowledge about CPD[14]. Our study showed that key motivators for CPD were, 'moral and civil duty', 'patriotism', and 'control' with a *p*-value of 0.001, 'altruism from adversity' and 'post-traumatic growth' with a *p*-value of 0.000. For comparison, another study conducted in the UK suggested that the strongest motivator was altruism from adversity with P-value of 0.001.[15] In this study, the results are almost the same because of the helping nature and humanity of people around the globe.

In our study, major obstacles in plasma donation were fear of becoming ill again (*p*-value of 0.000), and the logistic barriers (*p*-value of 0.024). Female participants showed more reluctance than males towards donation as shown in table IV. In a study conducted in the UK, fear of needles was a major barrier in convalescent plasma donation.[16] The difference between the two studies indicates a lack of information and research in our society. Such assessments are vital as the subsequent perceptions could assist with further developing CPD in current and future pandemics. Later on, endeavors to observe contributors ought to be put together both with respect to giving them suitable information and forming good perspectives. A study conducted in Peru suggested that contribution to research and supporting people suffering from COVID-19 were the main motivating factors among donors while fear of contracting the infection in the hospital was the main barrier[2]. A study conducted in India showed that among healthcare workers doctors were more interested in convalescent plasma donation.[3] Another study showed that among convalescent plasma donors 85% were males.[4] A study conducted in Gujarat, India showed that donors had satisfactory knowledge about convalescent plasma donation. Among the non-donors, majority (47.8%) had no knowledge about plasma donation, and some had a belief that donating plasma will weaken them or they will contract the disease.[5]

Conclusion

This study indicated that knowledge of participants regarding CPD was satisfactory. Knowledge had a positive impact on motivation to donate CP. Barriers to convalescent plasma donation were more common in female participants. Barriers showed a negative correlation with key motivation and knowledge.

Instructive projects focused on the awareness and encouragement of convalescent plasma donation practice amongst the overall population is the need of the hour. Future studies should be more centered around understanding the mental boundaries towards convalescent plasma donation, particularly in the gathering of youthful grown-ups who have recuperated from COVID-19 disease.

Recommendations

1. People should be motivated to donate after recovery from COVID-19.
2. It may also be advantageous to target moral and civil duty attitudes by focusing on aiding family and friends.
3. Donation-related fears should be explicitly acknowledged.
4. Media, both electronic and print should play its role to spread awareness about CPD.

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