

ORIGINAL PAPER

Exploration of COVID-19 related fears deterring from blood donation in India

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Introduction The coronavirus pandemic (COVID-19) has impacted and pushed the healthcare settings to extremes across the globe. It was extremely challenging to sustain blood donation, and strategies could be formulated on knowing fears hindering blood donation.

Methods A cross-sectional survey using Google Forms[®] through WhatsApp and email after obtaining the ethical clearance. The survey questionnaire was validated for content using the Delphi technique, and pilot tested for finalization.

Results The survey was attempted by 1066 participants, and 749 participants who had not donated since pandemic were included in the study. A little more than half, 415 (55%) reported either one or more than one fear during the pandemic which hindered blood donation. They reported lack of confidence in the safety measures at the hospitals and fear of transmitting infection to family, in 415 (55%) of the participants each, respectively. The fear of COVID-19 hospital infection risk and hospital entry was statistically significant across the age groups that are eligible for blood donation.

Conclusions The clear and dedicated confidence building measures to sustain blood donation using all communication modalities clearly emerge as the most important strategies to augment blood donation in the COVID-19 pandemic. The measures should include information about implementation of safety measures to mitigate COVID-19 transmission at the blood centres and that the act of blood donation does not increase risk of COVID-19 and therefore the risk of transmission of infection to family.

Key words: blood centres, blood transfusion services, fears, lockdown, pandemic.

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Introduction

A significant and universal challenge for most of the blood centres is to maintain an optimum level of blood stocks to meet the demand. The challenges for doing so, for the developed countries, are different than in the developing countries [1]. The primary challenge for the

developed countries is declining trends of blood donations [1–3]. On the contrary, the developing countries have never been able to reach the needed blood demands [1, 4, 5]. The Government of India (GoI) has given a push to the blood needs of the country by establishing model blood banks (MBB), the blood collection and component separation units (BCSUs) and the blood storage centres (BSC) as part of the dedicated efforts under the National Action plan on blood safety after the adoption of the National Blood Policy in India [6]. Over the years, there is an increase in the number of blood banks. However, this has not translated into an actual increase in terms of

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blood donations, as there is a constant need to motivate the first-time blood donors to retain them as regular repeat donors.

The current clinical need of blood is estimated to be 20.1 per 1000 population, of which only 11.2 donations per 1000 population is met, which reflects a real gap between the demand and supply in India [7].

The World Health Organization (WHO) has mapped the availability of blood in a country to the number of whole blood donation [1]. As per the National AIDS Control Organization (NACO) of India, there are 12.2 million donations against the projected demand of 15 million [8]. As per the Global Status Report of Blood Safety and Availability by WHO, India has a median 6.8 whole blood donations per 1000 population as compared 31.5 donations per 1000 population in high-income countries [1]. A primary reason for this shortfall can be lack of awareness and motivation regarding voluntary blood donation (VBD) in the community and primarily hospital-based blood collection systems (decentralized) [9]. Being a developing country, the blood collection from family and friends as replacement donors is still an important part of majority of the hospital-based blood collection facilities [10, 11].

Pandemics of respiratory infections like influenza, or viruses that cause severe acute respiratory syndromes (SARS) like the present coronavirus disease 2019 (COVID-19), directly and indirectly, hit healthcare settings and the same is an absolute disaster for the BTS [10, 11]. The diabolical nature of such pandemics hit BTS hard as it adversely affected blood donor availability and human resources required to mobilize the collection of blood [10–18]. The absolute and partial lockdown to minimize the transmission of the infection directly affected the blood collection due to the restrictions of the social movement for the safety of the population at large. One of the important key elements as part of the response plan of the BTS during influenza pandemic was to motivate, recruit and request our regular repeat volunteer blood donors to maintain blood supplies using all logistical support for the blood donation operations [10–18]. However, all this could be achieved for optimization of blood supplies once the reasons hindering blood donation are understood.

At the time the present study was planned, the PubMed search did not yield any similar publication. Keeping in mind the present online survey was carried out to understand the fears hindering blood donation during the ongoing COVID-19 pandemic in the demographic. This survey will help hospitals to better equip in the future to plan the needs in challenging times.

Material and methods

Study design

A cross-sectional survey through the online mediums such as WhatsApp and email employing snowball sampling strategy was applied. The survey questionnaire was circulated using Google Forms[®]. The survey was conducted from the 13th of May through the 14th of June 2020. The survey was conducted after obtaining the ethical clearance (NK/6249/Study/123; 8 May 2020) for the study.

Study settings

General settings

Postgraduate Institute of Medical Education and Research (PGIMER) is an institute of national importance situated in Chandigarh, Union Territory in India. The institute receives patients from almost all states of the country, but it primarily caters to patients from Chandigarh, Jammu & Kashmir and Ladakh (UT), Himachal Pradesh, Haryana and Punjab State. PGIMER is a 1948-bed hospital with approximately 100 thousand patient admissions, 265 thousand operative surgeries and provided approximately 2.9 million outpatient consultations in 2019 [17].

Specific settings

The department of transfusion medicine supplied 135 thousand blood components in the year 2019 [19]. The annual collection of the department was 57 842, 84% from voluntary source with 417 outdoor voluntary blood donation drives during the year 2019–2020 [20].

Study population

The targeted population was the representative blood donor population of the northern region, using snowball sampling. Initially, the survey questionnaire was disseminated among few registered voluntary blood donation camp organizers, few individual donors and in general population in contact with the authors. Subsequently, they were requested to circulate the same among individual contacts.

Sample size

It is desirable to obtain at least 60% response rate in online surveys [21]. However, keeping in view the present pandemic, we assumed that a minimum of 50% of the participants would respond to the survey. Therefore, the sample size using OpenEpi[®] software was calculated at 99% confidence levels with an assumed prevalence of 50%. The required sample size to conduct an online

survey with an absolute margin of error at 5% was 664. We assumed that 20% of the responses would be half-filled, empty or suffer from other drawbacks such as language barrier and electronic communication. Therefore, the adjusted sample size needed for the study would be 830. Further, there are 10 variables of interest which may affect the study outcome. Thus, updated and final sample size for the current online survey was calculated as $830 + 20 \times 10 = 1030$. However, by the time survey was closed on 14th of June 2020, we received responses from 1066 participants. The fears option was open to 749 participants, who reported not donating blood since the start of the pandemic, and all 749 were retained for analysis.

Questionnaire

To formulate the questionnaire, a review of literature, interaction with experts and the feedback provided by the voluntary blood donation camp organizers and few individual donors was taken. The reasons mentioned by the voluntary blood donation camp organizers and the individual donors were included in the language that could be locally understood. The initial questionnaire was circulated to the expert group comprising of a Psychiatrist, Biostatistician and five experts from the Transfusion Medicine for content validity. The Delphi technique was adopted to revise the questionnaire. The questionnaire was finalized by the experts after three revisions. Subsequently, the expert finalized questionnaire was pilot tested among the targeted population. A sample size of 30 was used to pilot test the survey. A random subset of five participants were interviewed to take a feedback about the ease of understanding and flow of questions. Based on this feedback, the questionnaire was further refined. All such feedback was carefully drafted to obtain the best possible response from the participants. Finally, after the content and construct validation, a total 11 items were included in the questionnaire. The spectrum included two items related to COVID-19, first the fear of getting infected during the act of blood donation in the participant (Fear of contracting COVID-19), the fear of weakening of immunity post-blood donation in the participant (Fear of weakened immunity after blood donation). One item related the possibility of transmission of infection from the blood donation venue to the family (Fear of transmitting infection in family). Three items related to the hospital setting, first the fear of entering a general hospital irrespective of blood centre location in the hospital (Fear of entering hospital), the second the fear of a high risk of infection in a designated COVID-19 hospital in which the blood centre is located (COVID-19 hospital carries high risk of infection) and third the lack of trust in the safety precautions against spread of COVID-19 at hospitals (There are not strict safety

measures at hospitals). Since, our institute had a designated COVID-19 status, the need to capture the fear of hospital entry and the fear of high risk of infection in a designated COVID-19 hospital was finalized. One item included the psychological impact of COVID-19 on the population, the unknown fear that prohibited the individual to move out of his residence for any activity in general (Unknown fear that prohibits me to move out of my home). Two related to the administrative norms of imposing social distancing, first in form of lockdown (Fear of breaking norms of lockdown) and second the fear of uniformed law enforcement agencies implementing and monitoring lockdown (I don't want to travel due to fear of police). A consent of family members was also kept as one option (My parents/family members do not allow me to donate blood). Finally, a concern about the possible wastage of blood was also included (My blood will go waste as there are less patients in hospital). Option to report more than one fear were kept open in the survey.

Data collection and analysis

The brief descriptive information about the study and informed consent was provided on the first page before the participants were able to access the online survey. The data from the survey were downloaded in the spreadsheet. The original data sheet was saved in a password-protected computer folder of the principal investigator. The duplicate copy of data was anonymized first before undertaking any data cleaning, sharing and subsequent analysis. Variable labels and levels were cleaned and coded before doing any data analysis. Finally, a master sheet along and the coding sheet was used for final analysis and interpretation.

The descriptive statistics for categorical and continuous data are presented as frequency (percentages) and mean (standard deviation). Horizontal bar charts and stacked bar charts were used to highlight the important characteristics of the study. Chi-square test was used to assess the association between two categorical variables. A 2-tailed $P < 0.05$ was used to declare the statistical significance.

Results

The survey was attempted by 1066 participants, which included 749 participants who had not donated blood since the start of the pandemic and were eligible to report reasons hindering blood donation. Of the 749 participants included in the study, there were 301 (40%) male and 436 (58%) female, respectively. Gender-related data were missing for 12 participants. Majority of the participants were unmarried (59%). Participants were categorized in three age group of 18–25 (39%), >25–50 years (58%) and >50 years of age group (7%), with 15% from rural and

83% from urban background. Participants were further categorized according to their education and occupation. On basis of education, the majority of participants were postgraduate (34%) followed by graduate (29%), had professional educational (25%) and studied up to senior secondary level (10%). On basis of occupation, about half of the participants (53%) were students followed by service class (33%), business (9%) and others (3%). About half (53%) of the participants had an elderly above the age of 60 years at home (Geriatric), whereas only one-fourth (26%) had children of less than 10 years of age at home.

More than half, 415 (55%) out of 749 participants reported either one or more than one reason for not being able to donate blood from the reasons that were incorporated in the questionnaire as depicted in Fig. 1. Whereas a little less than half, 334 (45%) did not mention any fear as depicted in Fig. 2. The two most common reasons for not being able to donate blood, reported by 55% of the participants (a little more than every 2nd participant) was about the safety measures at hospitals or the transmission of the infection to their families, respectively.

The fear of contracting COVID-19 was reported by 27% of the participants (a little more than every 4th participant). Fear of weakening of their immunity and the fear of hospital entry was reported by 20% and 19% of the participants, respectively (almost every 5th participant). The fear of COVID-19 hospital infection risk and family restrictions was reported 17% and 16% of the participants, respectively (nearly every 6th participant). An unknown fear to moving out of home, fear of police and breaking norms of lockdown was reported by 11%, 9%

and 8% of the participants, respectively (nearly every 10th participant), as shown in Fig. 1.

Figure 2 details the frequency of fears reported by the participants. A little less than half of the participants (46%) did not respond to any of the eleven items in the questionnaire. Presence of two, three, four and five fears together were reported by every 13th (7%), 7th (14%), 8th (13%) and 12th (8%) participant, respectively. Worth mentioning is that not even a single participant reported the presence of a single fear alone.

Figure 3 depicts the presence of more than 2 fears together. Fear of contracting COVID-19 and the fear of COVID-19 hospital infection risk was observed together in 25% of the participants. Fear of hospital entry and fear of COVID-19 hospital infection risk was observed together in 17.3% of the participants. Unknown fear to move out of home and fear of breaking norms of lockdown were observed together in only 7% of the participants. Notably, close to three-fourth participants did not report the presence of two fears simultaneously, that is unknown fear to move out of home in addition to the fear of breaking lockdown norms together. This is positive indication that is to be utilized for the augmentation of blood donation.

Table 1 and 2 details the demographic characteristics of the study participants and the comparison of fear across various demographic characteristics. The fear of contracting COVID-19 and COVID-19 hospital infection risk when compared across the genders was statistically significant. Comparison of other fears across the genders did not bring out statistical significance. Fear of contracting COVID-19 and hospital entry when compared across the

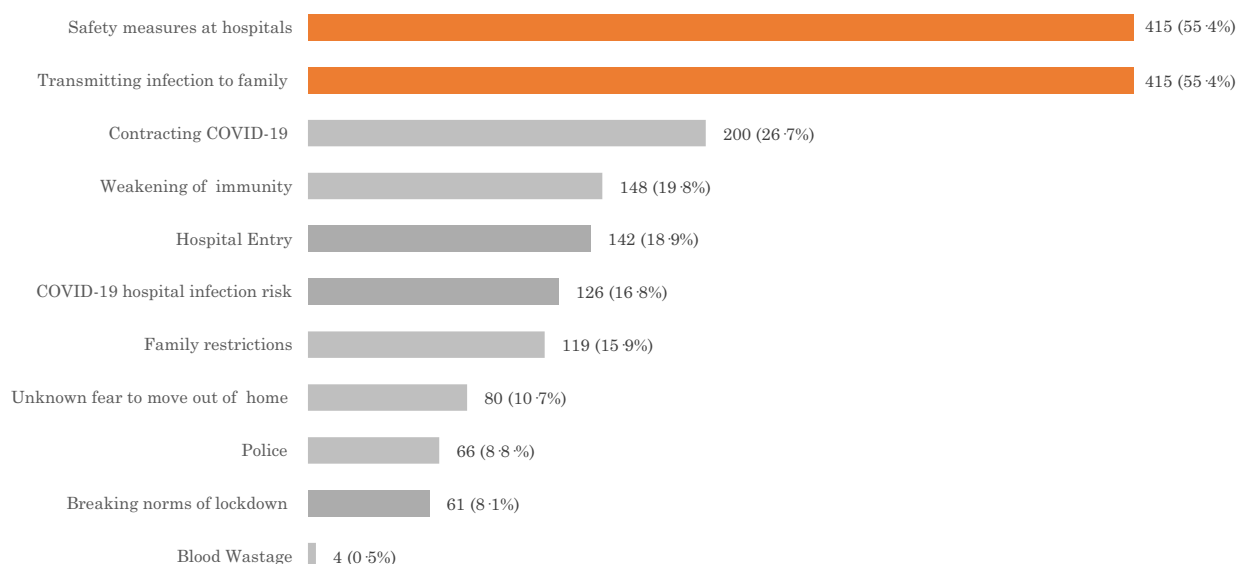


Fig. 1 Fears that prohibited blood donation in the online survey among 749 participants conducted at PGIMER, Chandigarh, India, in May-June 2020.

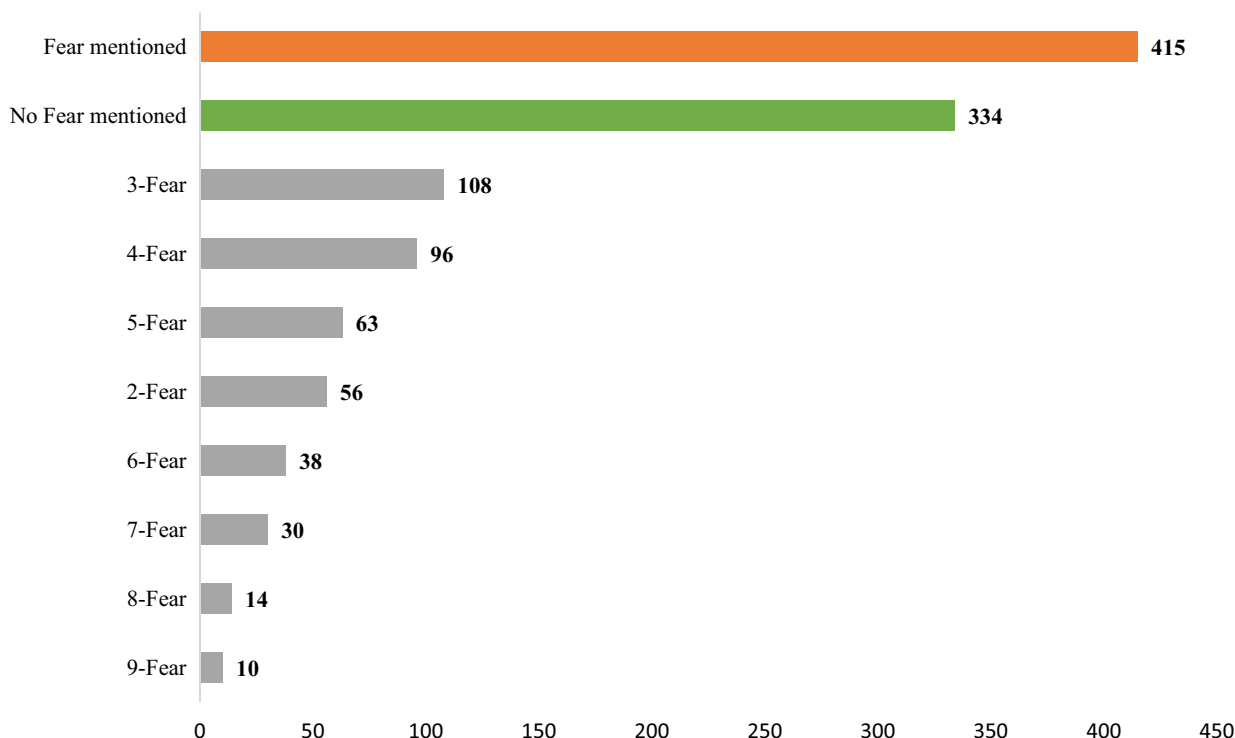


Fig. 2 Frequency of Fear in the online survey among 749 participants conducted at PGIMER, Chandigarh, India, in May-June 2020.

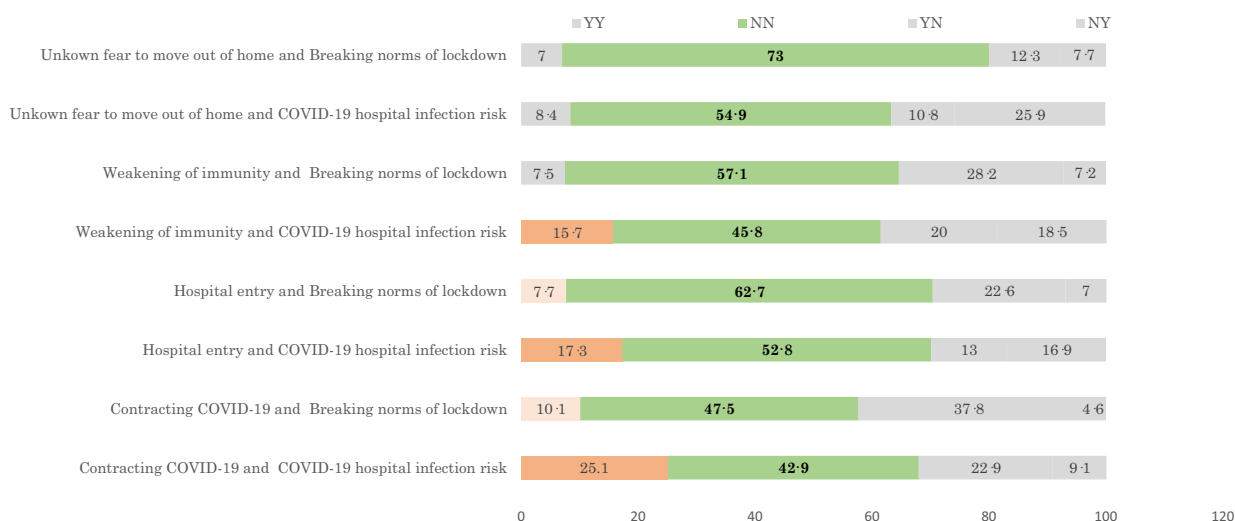


Fig. 3 Comparison among two fears prohibiting blood donation in the online survey among 749 participants conducted at PGIMER, Chandigarh, India, in May-June 2020. YY, Yes-Yes (Presence of both fears); NN, No-No (Absence of both fears); YN, Yes-No; NY, No-Yes (Presence of only one fear) respectively. Numbers are representative of percentage (%).

age groups was statistically significant. Comparison of other fears across the age group did not bring out statistical significance. The fear of contracting COVID-19 and hospital entry when compared across the occupation was statistically significant. Comparison of other fears across the occupation did not bring out statistical significance.

The fear of COVID-19 hospital infection risk when compared across the presence of geriatric resident of more than 60 years at home was statistically significant. The unknown fear to move out of home when compared across the absence of children of age less than 10 years at home was statistically significant. Comparison of other

fears across the presence of geriatric and children at home did not bring out statistical significance.

Discussion

The present COVID-19 pandemic necessitated a large-scale lockdown in India. This was primarily to decrease person-to-person transmission of the infection. The GoI, established a clear communication with the public using dedicated websites of the MoHFW, National Disaster Management Authority (NDMA), COVID warriors and India Fights Corona COVID-19 in addition to the usage

of television, radio and social media [22–25]. Tackling a lockdown in one of the largest democracies was a challenge that was taken up in the best possible way. The advisory about voluntary blood donation was also issued by the National Blood Transfusion Council (NBTC) and the State Blood Transfusion Council (SBTC) of the Union Territory, Chandigarh in the third week of March 2020 to facilitate blood donation [26]. However, despite all the actions, there was a drastic reduction in the blood donations across the country. This is because of the inability to take an articulate decision for blood donation due to loss of the ability to check the truth of one's thought under the prevailing emotional influences during a pandemic, and the loss of social mobility due to imposition of lockdown [27]. It is imperative to note that the loss of social mobility is almost akin to the grief that is noted consequent upon loss of a close associate. The typical emotional reaction in an apparently healthy individual is described in five phases, that may vary from one individual to another in both sequence and severity. The phases are disbelief or denial, anger, sadness, acceptance and finally the sun rises with hope. The psychiatric symptoms of the psychological stress may range from irritability, anger, emotional exhaustion to some severe manifestation [28, 29]. Worth mentioning this has been reported in one-fifth (Reduced awareness, being in a daze/feeling confused/unable to think clearly) and one-fourth (Poor concentration and felt indecisive) of the study participants in an online survey of psychological impact of COVID-19 lockdown in general population from India [29].

The findings of the present online survey bring out a few very interesting observations that relate to the psychology of the study participant during the COVID-19 pandemic apart from the direct fear of contracting the COVID-19 infection per say in the potential blood donor.

A little less than half, 334 (45%), did not mention any fear deterring blood donation and this pool is most important to target for augmenting blood donation. In the other pool, there are two fears reported by most of the participants in the present study. These include, lack of confidence in the safety measures at the hospitals and fear of transmitting infection to family, both in 55% percent of the participants each, respectively. Worth mentioning is that both the findings have been reported from India, by Grover *et al* in their earlier online survey assessing the online survey of psychological impact of COVID-19 lockdown in general population [29]. They report that about one-third of the participants had uncertainty about frequent modification of infection control practices, whereas about one-fourth reported fear of going out of home, because of fear of infecting family members [29]. Therefore, the establishment of clear communication

Table 1 Demographic characteristics of the study participants in the online survey among 749 participants conducted in PGIMER, Chandigarh, in May–June 2020

Characteristic ^a	No. (%)
Total participants	1066
No donation (<i>N</i>)	749 (70.3)
Maximum response (<i>n</i>)	415 (55.4)
Gender	
Male	301 (40.2)
Female	436 (58.2)
Age -yrs.	
18–25	289 (38.6)
>25–50	307 (58.2)
>50	51 (6.8)
Marital status	
Married	292 (39)
Unmarried	440 (58.7)
Education	
Senior Secondary	77 (10.3)
Graduate	218 (29.1)
Postgraduate	255 (34)
Professional	186 (24.8)
Occupation	
Students	395 (52.7)
Service	248 (33.1)
Business	67 (8.9)
Others ^b	19 (2.5)
Residence	
Rural	111 (14.8)
Urban	623 (83.2)
Geriatric ^c	
Yes	392 (53.6)
No	339 (46.4)
Children ^d	
Yes	194 (26.5)
No	537 (73.5)

^aMay not add up to 100%, due to missing entries.

^bOthers included daily wagger, domestic help and small shopkeeper.

^cGeriatric included the presence of >60 years elderly at home.

^dChildren included the presence of <10 years child at home.

Table 2 Comparison of fears across demographic characteristics in the online survey among 749 participants conducted in PGIMER, Chandigarh, in May–June 2020

Fear and demographic characteristic ^a	Yes (% ^b)	No (% ^b)	P value ^c
Contracting COVID-19			
Male	98 (23.8)	55 (13.4)	<0.001
Female	100 (24.3)	158 (38.4)	
COVID-19 hospital infection risk			
Male	66 (16.1)	86 (21)	0.002
Female	74 (18)	184 (44.9)	
Contracting COVID-19			
Age-yrs.			
18–25	78 (11.4)	103 (38.8)	0.01
>25–50	89 (24.6)	73 (20.2)	
>50	12 (3.3)	7 (1.9)	
Hospital entry			
Age-yrs.			
18–25	41 (11.4)	140 (38.8)	0.001
>25–50	67 (18.6)	94 (26)	
>50	7 (1.9)	12 (3.3)	
Contracting COVID-19			
Occupation			
Students	105 (25.9)	140 (34.5)	0.001
Service	62 (15.3)	49 (12.1)	
Business	22 (5.4)	14 (3.4)	
Others	8 (2)	6 (1.5)	
Hospital entry			
Occupation			
Students	56 (13.8)	189 (46.7)	<0.001
Service	39 (9.6)	71 (17.5)	
Business	22 (5.4)	14 (3.5)	
Others	6 (1.5)	8 (2)	
COVID-19 hospital infection risk			
Geriatric ^d			
Yes	83 (20.4)	131 (32.2)	0.009
No	56 (13.8)	137 (33.7)	
Unknown fear to move out of home			
Children ^e			
Yes	32 (7.8)	75 (18.3)	0.001
No	47 (11.5)	256 (62.4)	

^aOnly with statistical significance are represented in the table.

^bMay not add up to 100%, due to missing entries and percentage is within total participants.

^cPearsons Chi Square or linear by linear association for 2 by 2 or 4 by 2 table respectively.

^dGeriatrics included the presence of >60 years elderly at home.

^eChildren included the presence of <10 years child at home.

about the update in the standard operating procedures (SOP) to minimize transmission of COVID-19 in blood centres and that COVID-19 infection is not transmitted by the blood donation procedure and therefore there is no fear of transmission of infection to family emerge as the two most important strategies to be implemented for augmentation of blood donation. This would be in line with the WHO recommendations for protecting blood supplies

during influenza pandemics [18]. This would also be in line with the recommendation made by Masser et al. that addressing (perceived) barriers to donate may assist in maintaining blood supplies during the avian influenza outbreak [30, 31].

The clear communication with the population should include the information on implementation of infection control practices at the blood centres and that COVID-19

is neither spread through the process of blood donation, and thus, there is no additional risk of transmission of the infection to the donors' home.

The change in the SOP of the blood centre for sanitization of all donor couches, and of multiple handled equipment and materials including sanitization of frequently touched surfaces, floors at regular intervals for the safety of the staff and the blood donors. The thermal screening of all donors, social and physical distancing, universal masking and the practice of hand sanitization using handsfree dispensers. The blood centre, all blood transport vehicles and blood mobiles are fogged for sanitization on daily basis in addition to the above detailed infection control measures.

Fear of contracting COVID-19 was reported by 27% of the participants, this was observed in almost double and triple of the participants in the studies from Sudan (61%) and The Peoples Republic of China (81%), respectively [32, 33]. This is the primary fear during any influenza that modifies the intention to donate. The intention to donate has been more related to the chance of contracting the infection in some of the earlier publications [30, 31, 34]. This also provides strength to the option of establishment of clear and dedicated communication with the potential blood donors mentioning and reiterating that COVID-19 does not spread by the process of blood donation per say, to promote the articulate decision to donate blood in potential blood donor population.

In the present study, the fear of hospital entry and the fear of COVID-19 hospital infection was seen in 18% of participants each respectively. Another study from India has also reported this finding [35]. This is expected that hospitals, by far would be a common source of infection transmission in an influenza pandemic, more so ever since the COVID-19 pandemic [36]. Fear of contracting COVID-19 and the fear of COVID-19 hospital infection risk was observed together in 25% of the participants. Fear of hospital entry and fear of COVID-19 hospital infection risk was observed together in 17.3% participants. Taken together the above three findings clearly point towards the consideration of shifting of donations towards standalone blood bank and inducting mobile blood donation facilities that are on wheels for arrangement of collection at the donor's proximity may therefore be viable options, as they will allay the hospital-related fears. The blood mobiles have been of help in augmenting voluntary blood donation as in an earlier publication from the region [37]. Taking a clue from the findings, the option of having a centralized blood collection with smaller satellite facilities, away from hospital premises in area with dense residential, office, shopping facilities like malls or religious places with heavy visitors' inflow may well be the next level of blood collection sites worth

exploring on day to day basis even out of context of pandemics.

There is fear related to travel in 9% of the participants, also seen in the study from Sudan (33%) [32]. The facility of dedicated sanitized vehicles and travel passes for blood donor transport may help minimize this problem.

The presence of single fear was not noted in any of the study participants, and a little less than half (45%), did not provide any answer to any of the fear's items in the questionnaire. This is the pool of participants that either did not have any fears or did not respond due to reasons out of scope of this survey. This is quite a sizeable pool (almost half of the participants who said that they had not donated since the start of the pandemic) that can be targeted for encouraging blood donations during respiratory pandemics.

The background psychology of the lack of trust in safety protocols at the hospitals and the consequent fear transmitting infection to family are reinforced by the observation of subtle coexistence of two fears in one study participant. Firstly, the coexistence of the fear of contracting COVID-19 and COVID-19 hospital infection risk is observed in 25% of the participants. Second, the coexistence of the fear hospital entry and COVID-19 hospital infection risk in 17% of the participants. These provide strength to the strategy of establishing clear communication about the update in the standard operating procedures to minimize transmission of COVID-19 at the blood centres to the potential blood donor population [18]. Of importance to transfusion services, 73% of the participants do not have the coexistence of fear of breaking norms of lockdown and unknown fear to move out of home. These findings also provide strength to the strategy of shifting of donations towards standalone blood centres and inducting mobile blood donation facilities that are on wheels for arrangement of collection at the donor's proximity as worth exploring options.

There are four other interesting findings that achieve statistical significance in present survey. First, the fear of contracting COVID-19 and COVID-19 hospital infection risk was more in female gender, which has also been reported earlier also by Masser *et al* [30]. This is not a cause of worry, since worldwide most donors are male, at our institute the female blood donors are less than 10% since the last 2 decades [1, 38, 39]. Second, the fear of contracting COVID-19 and hospital entry were more in middle-aged donors as compared to young and elderly donors. Third, the fear of contacting COVID-19 and hospital entry was more in student population followed by service class and least in business class. Both middle-aged donors and students are important donor base in our routine [1]. Therefore, the information, education and communication strategies must focus on middle age and

student donors, to yield the best results. Fourth, the unknown fear to move out of the home was more with the presence of elderly in family, whereas it was not so for the presence of children early in the pandemic, probably the concern about infection being severe in elderly and in adults with co-morbidities was spread earlier, and the concern of children acting as carriers or being infected themselves percolated a little later in chronology since the advent of the pandemic [40, 41].

Limitations

The authors acknowledge that the reasons for no response to fear items could not be delineated, since the questionnaire did not have such articulation. Even though best efforts were made to reach out to maximum participants for an adequate representation, there may still be some shortcomings as only online modality was adopted. The small survey participant numbers may still be a limitation. The study results may also be influenced by the panic that was rampant on the psychology of the entire population since the start of the COVID-19 pandemic. Finally, the results are for the population of the region and may not be generalizable across the globe.

Summary and conclusions

The initial results of the survey carried out on 749 participants bring out important information for blood centre, that there is a potential pool of population who did not respond to the fear items and should be the primary target for intervention to augment blood donation during pandemics of respiratory infections like influenza or viruses that cause severe acute respiratory syndromes like the novel corona virus of 2019. Though the interventions may also be carried out on the participants harbouring fears. These targeted interventions could utilize the five important strategies that emerge from the survey as confidence building measures with clear and dedicated communication using all modalities to augment blood donation in the COVID-19 pandemic.

The first is about the implementation and strict adherence of safety measures to prevent the transmission of COVID-19 at the blood centres. The second is that COVID-19 does not spread primarily by the process of blood donation, and therefore, there is no fear of transmission to family. Third that focus must be on students and middle-aged potential blood donors. The fourth is consideration of the shifting of donations towards standalone blood centres and inducting mobile blood donation facilities that are on wheels for arrangement of blood collection at the donor's proximity. The fifth is the facility of dedicated sanitized

vehicles and travel passes for facilitation of blood donor transport, respectively.

However, for the best implementation, a hub and spoke model of centralizing blood collection with supply of blood and blood components to the hospitals based on their demand as an integral part of the disaster management directly under local administration would be the best approach to optimize the supply and utilization of this scare human resource, the collection of which is disrupted in wake of influenza pandemics.

Conflict of interest

The authors declare no conflict of interests.

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