Design Strategy to enable more periodic blood donations in India to tackle the current shortage of blood.

DRS Paper

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1. Abstract

India is currently facing a shortage of blood due to the lack of voluntary donors and less frequency of periodic donors as they are concerned about the safety regarding donation after the Pandemic. A major fraction of the adult population was found to be unaware of the requirement and the urgency of the situation and often give in to misconceptions leading to no donation. This project aims at understanding how to tackle the high demand and low supply of blood in the country and identify motivations that could aid the situation by studying the common trends and demographics of periodic donors and understanding the level of awareness that people have in this sector. The main objective of the study would be to devise how to bring in more first-time donors and encourage repeated donations to tackle the current shortage of blood in the country. Two types of studies, both qualitative and quantitative, were conducted. The findings from the study were mapped out and overlapped with the findings from existing literature to derive major conclusions.

2. Introduction

Blood Donation is the process by which a person voluntarily has blood drawn that is later used for transfusions when needed. It is performed under the supervision of blood banks or hospitals. The lack of blood donors is a global problem at this point, which prevents the demand for blood prompted by an aging population and increased life expectancy from being met is something that has to be taken very seriously at a community level. Currently, in India, 50 million units of blood are required per year but only 25 million are available. There is an urgent need for the country to build a sustainable voluntary donation program in urban and rural areas.

Blood shortage also results from poor communication and connectivity among blood banks, which cause inefficient management of demand and supply both in terms of safety and availability of blood. Failure to properly process and store blood and its components separately leads to underutilization and wastage of blood, especially in rural blood banks. India's blood transfusion system has always been inaccessible and inefficient because it is not accorded the requisite priority in the country's health agenda. There is a lack of coherence and commitment towards a focused regulatory framework around blood safety and accessibility and investment in blood transfusion infrastructure.

Meanwhile, inequities in access to and availability of blood have become extremely problematic due to the COVID-19 pandemic. The acute blood shortage crisis has only further compounded in rural and semi-urban areas. In the past year, voluntary blood donations have drastically reduced due to the cancellation of mass blood drives and poor donor turnout contributing to fears surrounding the coronavirus and resultant lockdowns. The COVID-19 pandemic has brought to the fore the fact that even when the healthcare capacity and focus shifts towards pandemic response, blood remains foundational to any healthcare system.

As per the World Health Organization (WHO), at minimum, 1% of the population must donate blood to meet a country's basic blood availability requirement. In India, currently, only 0.84% of the population donates blood voluntarily, leaving a shortage of over two million units of blood. This project aims at identifying the problems that prevent India from achieving this goal and devising methods to tackle them.

3. Aim of the Study

The ultimate aim of this study is to understand the motivations of periodic donors and understand how to translate the success to blooming donors and encourage repeated periodic donations mainly by studying the influence of digital media and how to use it as a catalyst to tackle the problem. Similarly, care is taken to understand the inconveniences and other hindrances faced by donors that prevent them from donating blood and to discover directions on how to tackle these in order to enable steady periodic donations in the country.

The main questions this study is supposed to answer are:

- 1. How do you encourage current donors to donate periodically?
- 2. How do you motivate non-donors to start donation?
- 3. How do you help the reluctant understand the severity of the situation and clear any misconceptions leading them to start periodic donations?

4. Literature Review

Blood Donation and the pertaining factors have been studied and worked on over the past years. Multiple research papers talked about the studies conducted to understand various demographics to draw up analyses of the major motivations ensuring repeated donations.

An extensive study by K. A. Fani and K. Ashraf along with others (2008) was aimed at understanding which motivational and sociodemographic factors are important for the improvement of a long-term pledge as a voluntary, non-remunerated blood donor. A survey through a questionnaire on active donors revealed the five

dimensions of blood-donor motivation namely, sympathy, social reasons, self-esteem, positive experiences associated with donation, and moral responsibility to donate. According to Zito, Elena & Alfieri, Sara & Marconi (2012), who conducted a study on donation trends in adolescents, Transfusion Centers, and Associations that want to target young people, should first rethink and adapt their organization and logistics to the particularities of the target population, providing support and information for individuals throughout the process, and make the youngsters an active part of the process. According to Jawień, Wiktoria (2021), the current pandemic situation is not an obstacle to donating blood. Blood donations should not be withheld unless there are health contraindications and efforts to promote blood donation during the Covid-19 pandemic should be continued.

Considering Millennials' demographic psychographic and characteristics (Dabula, 2021), it can be concluded that they are largely influential, active, and socially connected on social media. They can thus be receptive and interactive on social media and build positive attitudes and willingness to donate blood. In the study conducted by Torrent-Sellens, Joan & Salazar-Concha (2021), three motivational paths were obtained that could be used in the recruitment of future donors via digital collaborative platforms, which are widely used in other areas of digital life. The first two started from feelings of trust in the digital community and the third from the modern lifestyle and was linked to the subjective norm in the prediction of intention and actual donation.

5. Theoretical Framework

This study is mainly backed up by two theories, the Social Cognitive Theory and the Transtheoretical Model of Behavior Change.

5.1 Social Cognitive Theory (SCT)

Social cognitive theory, states that portions of an individual's knowledge acquisition can be directly related to observing others within the context of social interactions, experiences, and outside media influences. According to this theory, a person's learning occurs in a social environment with mutual interaction between people, the environment, and their behavior. On social media, people do not only become reactive but can also proactively share information and influence each other. Integrating this with the derivations from the Transtheoretical Model of Behavior Change can help lead to the further development of this study.

5.2 Transtheoretical Model of Behavior Change (TTM)

The transtheoretical model of behavior change is an integrative theory of therapy, developed by Prochaska, that assesses a person's readiness to act on a new healthier behavior, and provides processes of change or strategies to guide the individual. The TTM posits that individuals move through six stages of change: pre-contemplation, contemplation, preparation, action, maintenance, and termination. This theory could be used with respect to this study to develop strategies to induce non-donors to donate blood by integrating the other theories and to keep the periodic donors periodic (Appendix B).

6. Methodologies

6.1 Qualitative Study

Semi-Structured Contextual Inquiry was conducted with 16 interviewees including donors, non-donors, doctors, organizers, and medical professionals at blood banks. Blood donation facilities were also observed and interviewed. There are three main types of donation facilities: One that is part of a hospital, one that is independent, and the third that is a donation camp. I also visited Samarpan Blood Centre at Ghatkopar which is an independent blood center. They have the specific equipment for processing and storage and were much bigger than the one at the hospital. They also simultaneously run camps and have agreed to share their statistics with me. The hospital blood bank was slightly smaller and had less equipment. The third was a donation camp where I also had donated blood. Questions were targeted at understanding motives for donations, reasons that are stopping them from donating, general trends of donors, donations statistics before, during, and after COVID-19, the major problems faced, and processing and storage.

6.2 Quantitative Study

An online survey was conducted which brought in around 102 respondents. The survey mainly had three parts. The first set of questions focused on understanding the demographics and categorizing the user into one the user groups: donors, those who want to donate but have not been able to do so yet, and the third, the non-donors. The second set of questions depended on the category of users. In the case of a donor, the main focus was to understand their donation experience and hindrances to further donations if any. Similarly, in the case of someone who wants to donate but has not been able to do so, the target was to understand what is stopping them and what could help them donate. Finally, for

the non-donors, care was taken to understand why they did not want to donate and what necessary steps are required to help them change. The third part of the survey assessed the amount of knowledge regarding blood donation that the user thought they had and how much they actually had. This also helped in identifying what aspects of donation are still unknown to the general crowd and misconceptions if any.

The target age group was those aged between 18-35 but showcased responses from all age groups. The majority of the respondents were under the age of 30. This particular age group was chosen as they are the most exposed to social media and related digital platforms. Similarly, they are also willing to experiment with new things and mostly have a burning sense of adventure. Around 55 of the respondents were men and 46 were women, with varied demographics.

7. Major Findings

7.1 Insights from the Qualitative Study

My first user group was the donors who talked about their experiences and motivations. They also discussed how some of their families are skeptical and think that blood donation can lead to fatal blood loss. They also shared their experiences with the huge needles and how they overcame the fear with comfort from friends. The non-donors talked about how they wanted to donate blood but location and time never match up or the others who are scared of needles. Some others did not find it a need to donate as they thought their blood type was common. All of them were unaware of the current shortage of blood. The doctors explained the scientific side and explained that the needles are huge to increase the rate of blood output to avoid clots in the collected blood. Similarly, they

talked about how people tend to assume things and misinformation spreads quickly.

The major insights from the facilities included the fact that camps go better in institutions or work communities as donation helps them take a break from work. They also talked about how donor count has massively come down since COVID and how in India sometimes there is not enough blood and sometimes a lot of blood goes to waste due to a lack of communication between banks. I had also donated my blood during the course of this project. I had always wanted to but never had a chance before as my Hemoglobin levels were consistently low until now. Similarly filling out the eligibility form is a tedious process and something that people might want to avoid (Fig 7.1a). There is also no information regarding donation that can reassure maybe a first-time donor.



Fig. 7.1a Collected Artifacts during Qualitative Study

7.2 Descriptive Statistics from the Quantitative Study

55% of the respondents wanted to donate but have not been able to do so yet due to various reasons. After this, the users were classified into various groups as mentioned in 6.2. 77% of the donors seemed to have donated for the first time mostly because they wanted to donate blood. 39% also said that they did so because they were

aware of the huge demand yet limited supply situation. 89% of the first-time donations seemed to have happened between 18 and 30 years and only 22% of the total donors were periodic donors. 77% of the first-time donations happened at a camp even though 62% of the donors preferred to donate at a hospital. The fact that camps occur at inconvenient times and venues was found to be what 39% (most) of the donors hated about donation and the second was the fact that the arm hurts for a day after donation, slightly hindering day-to-day activities according to 34% of the respondents (Fig 7.2a). All the eligible donors were willing to donate again.

50% of those who wanted to donate, but have not done so yet were because they thought their blood groups were common and 40% of this category did not know if they were eligible. Their major concerns leading to non-donation included donation being a supposedly painful procedure and fear that it would obstruct their day-to-day activities. 68% of them were willing to donate if they were rewarded. The strict non-donors, however, said that they were against donation mainly because they are scared and think their blood group is common. 50% of the non-donors claimed that they would donate if they were rewarded.

In the knowledge assessment section of the survey, they were asked to assess their own knowledge regarding blood donation. Most of them rated themselves between 2 and 5 on a scale of 0 to 7. The majority claimed to know the fact that women can donate blood, that blood regenerates in 24-48 hours, and the common opinion that donation is not as painful as it looks. 73% of the total respondents were not taught anything related to the awareness regarding blood donation. Families of 60% of the donors were found to be in favor and 18% of them were donors themselves. 20% were skeptical of donation as they were unaware of the process and 9% thought blood

donation was dangerous. 54% of the total respondents seemed to know at least 1-3 donors. A whopping 67% of the total respondents were found to be unaware of the current shortage of blood in the country. 55% of the respondents seemed to have come across someone who was in urgent need of blood. In 41% of the abovementioned cases, blood was donated by friends and family and in 39% of the cases, blood was available at a bank.

To Identify	Variables	No. of People	Percentage
Factors Motivating Blood Donation	Current Shortage	27	26.5
	Someone close in need	22	21.6
	Rewards	53	51.9
Reason for not donating blood	Fear of Pain	44	43.1
	It is dangerous	8	7.8
	Inconvenient	50	49
Best way to disseminate message	Social Media	51	50
	Advertising	21	20.6
	News	11	10.8
	Satisfaction Stories	19	18.7

Fig. 7.2a Collected Artifacts during Qualitative Study

8. Analysis

The fact that most donors donated blood during their 20s maybe because this is the age when people tend to try out new challenging things. Maybe most of the first-time donations happened at a donation camp as that might have been more accessible at the time but they preferred it because they like the atmosphere and hygiene at a hospital better than that at a temporary, public camp. Inconvenience and lack of knowledge were why most of those who wanted to donate haven't so far. Contracting infection and obstruction to daily activities seemed to be the biggest concerns. Those who did not want to donate no matter what said a solid

no because of fear of donating blood coupled with assuming their blood type is common. Thinking some blood group is common is clearly a misconception. It was found that only very few people knew about the health benefits, safety regarding infections, and the number of lives saved. People were also found to be unaware of the process, eligibility, and pre- and post-donation measures. Most of the families were found to be in favor but there was a considerable number of people who were skeptical and a few who thought it was dangerous mostly because they were unaware.

My first set of inferences from my qualitative study concerned the people (Fig 8.a). They were unaware of the importance and urgency of the situation and lacked knowledge regarding the process and personal benefits. Misconceptions and Inconvenient location and time were also major factors. Pain Points regarding the facilities (Fig. 8.b) and organizations included the lack of outreach and not targeting people as simple banners do not catch attention. They also lack presentation and Public Relations as information overload is usually ignored misinformation spreads quickly. They included a major lack of outreach and information design and the lack of a welcoming experience that could cater to more periodic donations. From the qualitative study, it was evident that communities and organizations created solely for blood donation seemed to have a higher periodic donor count, and satisfactory user stories and social media groups also seemed to work out. Posters, pamphlets, notices, and publicity in India were not working and most camps were found to be boring and inconvenient.

From the derived statistics, it is safe to come to a conclusion that most people are unaware of the procedure and necessity of blood donation. And even in cases where people do know, they are not aware of the sudden urgency and acute shortage of readily available

blood post-pandemic. The main focus should be on making the people aware of the situation, procedure, and health benefits. A collective effort by the donation facilities and the people of all user groups has to be made to bring about a change of such a large magnitude among the general public, out of which most have a very contradicting outlook on the whole situation.

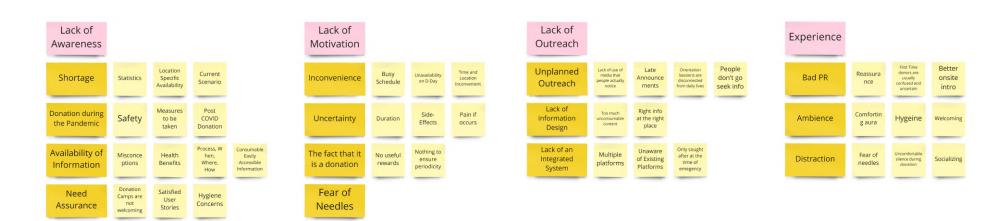


Fig. 8.a Problem areas regarding the people

Fig. 8.b Problem areas regarding the donation facilities

9. Suggested Design Strategy

The approach has to be in both directions as the people and the facilities are co-dependent (Fig 9.a). Some of the opportunities regarding the people involved taking information to the user rather than waiting for them to come to seek it to tackle lack of awareness and instilling a sense of safety and comfort before, during, and after donation for reassurance. Similarly, some of the design opportunities for the banks (fig 9.b) involved using the surroundings for distraction by providing a more interesting ambiance and redesigning the existing information using a targeted approach, and so on. The stakeholders could be drawn up as a system and could be simplified into one cycle where, in an ideal situation the blood banks, hospitals, and organizations provide the people with awareness, reassurance, knowledge, and clarity regarding misconceptions leading them to donate blood periodically.

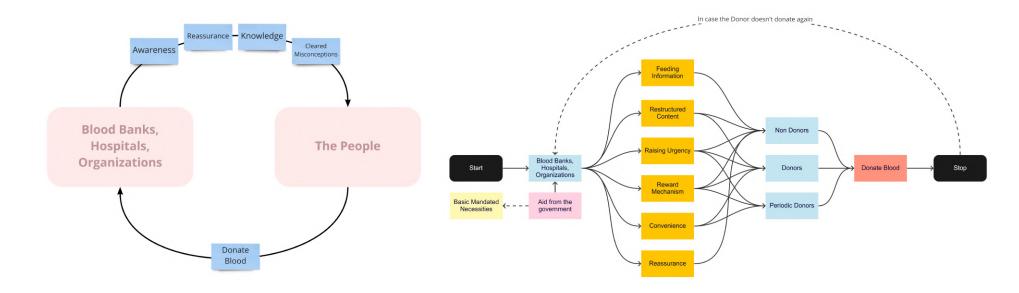


Fig. 9.a The people and the facilities as a system

Fig. 9.b Aspects to be addressed in case of each User Group

9.1 Applying the Transtheoretical Model of Behavior Change

The User Groups as segregated during the study could easily be superimposed on the Transtheoretical Model of Behavior Change. For example, the non-donors could be in the pre-contemplation stage, those who want to donate but don't know how to, in the contemplation and preparation stages, the first-time donors in the action stage, and the periodic donors in the maintenance stage. The termination stage does not really apply in this scenario. Each user group will require a rather different approach. Change should be brought about gradually, maybe in phases.

Phase one could target those who are in the action and maintenance phases. The aim of this phase should be to encourage periodic donors to keep donating and first-time donors to come back periodically. For this, especially in a pandemic-affected situation, they need something more than just the fact that the country is in urgent need of blood to look forward to. Maybe a subtle reward system could be implemented. For example, people sometimes have to wait for more than an hour at the OPD or while waiting for results and in that case, maybe a healthy bystander could donate blood which could serve as a base for redeemable discounts on hospital

bills. Another idea was to display blood availability statistics (Fig 9.1b) on the hospital Television at the OPD (Fig 9.1b) in case the hospital blood bank is running short of a particular blood group or someone urgently needs blood that is unavailable. This might trigger someone around to donate blood while they are waiting. This tackles the problems of shortage and lack of motivation.



Fig. 9.1a TV at hospital OPD showing News

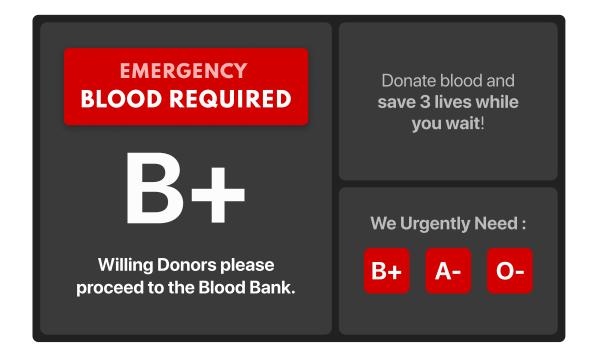


Fig. 9.1b The same TV showing blood availability statistics

The second phase should be aimed at those who want to donate but don't know how to and those who don't know much about donation but are willing to donate once they do as they are in the contemplation and preparation phases. What they need is knowledge regarding the process and benefits, and awareness regarding the sheer need for blood in the country. They also need reassurance that blood donation is a safe process. This one was about showing consumable content. The first was a motivational poster at a blood bank which was not legible or interesting (Fig 9.1c). The second shows a young girl happily donating blood with the tagline "I am not afraid" which is motivational and reassuring (Fig 9.1d). Similarly, the COVID stats on the Google search engine was widely used during the pandemic. So in case, blood is short in the user's particular location, it could show prompts that could make the user aware of the situation and enable better outreach (Fig 9.1e).

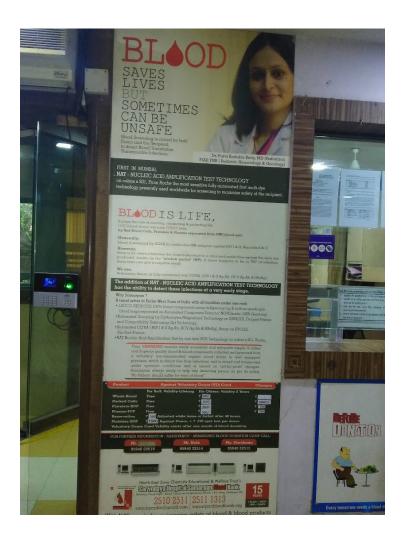


Fig. 9.1c Motivational Poster at a Blood Bank

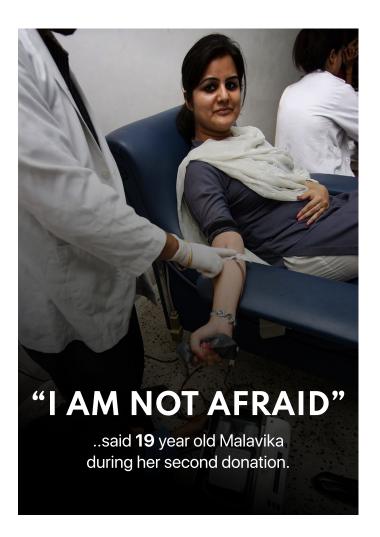


Fig. 9.1d Young girl donating blood which is reassuring

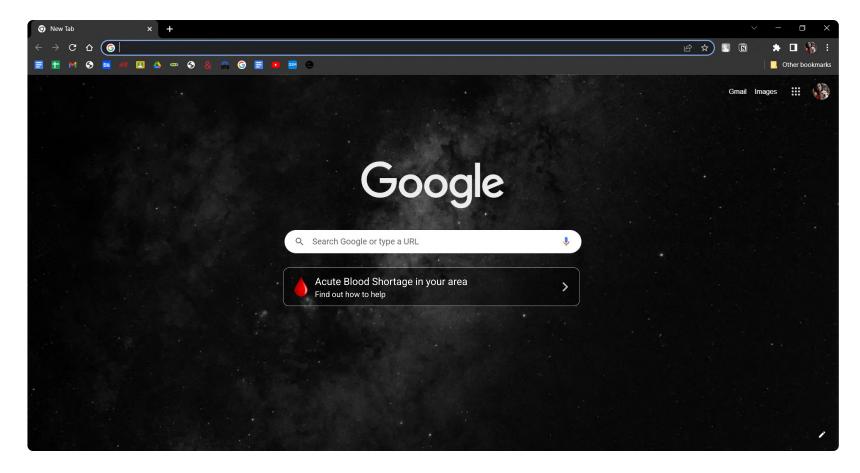
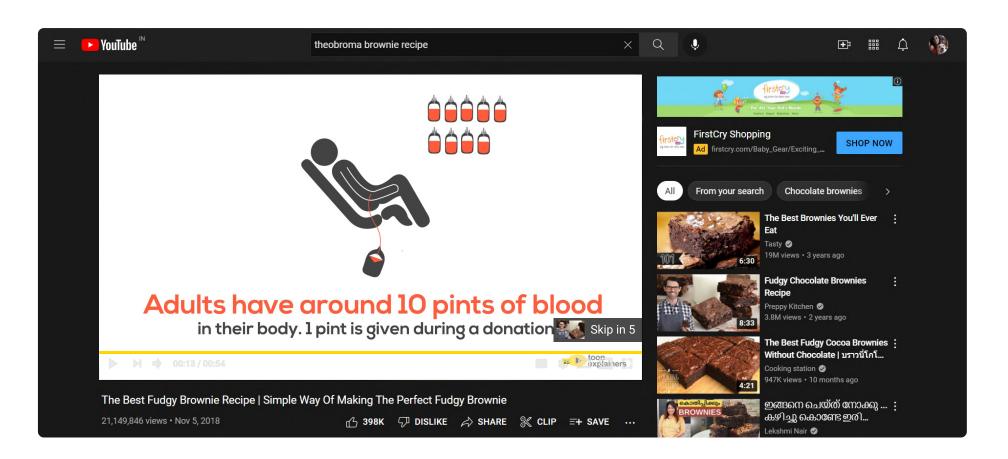


Fig 9.1e Showing prompts in case the user's locality is low on blood

Phase three would focus on the non-donors who are in the precontemplation stage. They need to be made aware of how urgent this situation is and that all of their thoughts on blood donation are probably corrupted due to common misconceptions. What they need is clarity regarding misconceptions, knowledge regarding the process and benefits, and awareness regarding the situation. Since the target user group is aged between 18 and 35 as they are the most exposed to social media, the approach could be through digital media. for example, Short informative ads could be shown at the beginning of a video especially on sites like YouTube as in most cases, they have to watch for at least 5 seconds. Similarly, Small facts could be shown while using applications that have ads while in use. This could be useful to feed the user unconsciously with information, one fact at a time. Another important detail is the fact that most donation facilities and awareness personnel have bad information design. People tend to ignore propagated information. It is crucial that the content be redesigned in a way that is consumable by the common Indian crowd.



9.2 Incorporating the Social Cognitive Theory

The Social Cognitive Theory could be used to connect the stages while attempting to transition the user groups in each stage according to the TTM to the next. This theory is base for the strategy to take the users all the way from the pre-contemplation stage to the maintenance stage. For example, those in the

maintenance stage will be motivators for those in the action stage. People in the prior stages are found to observe and learn for the immediately succeeding stages to satisfy various mental states. Reinforcement is usually found to come not only from external factors like environment and behavior but also from intrinsic factors as a form of internal rewards like pride, satisfaction, and a sense of accomplishment. People these days, especially our target user group is found to be extremely reactive on social media. Additionally, they are also proactive when it comes to sharing information that could easily influence each other. Some campaigns, especially those related to sustainable living and precautionary messages in relation to COVID-19 seemed to have a massive impact on the crowd. They helped people change their outlook towards certain things that have been a stable practice over the years. Similarly, the donation facilities need to be in the field that the people are in, in order to influence them. This commands them to have a well-planned outreach mechanism on social media specifically catering to the respective target user groups. For example, those who are scared of needles in the preparation stage will require a completely different approach compared to those who are scared that they will contract infections through donations.

Extending the outreach through digital platforms could be focused on the people to bring in more first-time donors and ensure periodic donations by tackling awareness, knowledge, and motivation aspects. Some of the simple design thoughts included real-time blood availability statistics outside hospital blood banks. Most hospitals are equipped with TVs at the OPD counters where people usually have to wait to get an appointment and later wait till they see the doctor. Availability statistics could be displayed on the screen in case the hospital blood bank is running short of a particular blood group or someone urgently needs blood that is unavailable. This was

to tackle the problem of shortage. Seeing this or through word of mouth, someone else also could get influenced leading to blood donation being more popular and talked about over time Similarly, the donation facilities also enable better outreach to rope in more donors and streamlining information, based on the crowd. It could be like feeding information unconsciously like the 20-second unskippable ads as discussed in Section 9.1 and finally ensuring a smooth experience that people would recommend to others.

10. Conclusion

Unavailability of Blood is a serious issue in the country and the Pandemic has added to that a lot. The people in India were found to be unaware of this urgency and often ignore it as they consider blood donation a tedious process. They were also found to be heavily clouded with misconceptions. This study mainly focused on understanding the people focusing on those between the age of 18 and 35. The main aim of the project was to answer three questions as mentioned in Section 3 about how to bring about a change regarding this matter. Using Qualitative and Quantitative Studies, the outlook of the people and the factors that are stopping them from donating were identified. Analysis of the studies helped bring out facts on why people see some things a certain way regarding donation as in the case of people thinking donation is a dangerous process. People were classified into three main user groups: donors, those who would like to donate, and non-donors. As part of a design strategy to overcome this shortage, a timeline-based approach was developed to tackle the hindrances faced by each user group in a unique way specific to them. The small steps as a whole are expected to make a collective difference in the community as backed by the Transtheoretical Model of Behavior Change and the Social Cognitive Theory.

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12. Appendix

12.1 Appendix A: Survey Questionnaire

https://forms.gle/Djjrq8URMEvys7Lr8

Part 1: Demographics

- 1. Name, Age, Gender, City
- 2. Where do you stand with respect to blood donation? (donor / wants to donate / not eligible / non-donor)

Part II: Understanding Donors

- 1. Motivation for the first time donation
- 2. Age at the time of first donation
- 3. Frequency of donation
- 4. First donation facility
- 5. Preferred donation facility
- 6. Like and hate the most about donation
- 7. Further donation plans

Part III: Those who want to donate but have not yet

- 1. Reason for no donation
- 2. Major concerns
- 3. Thoughts and Rewards

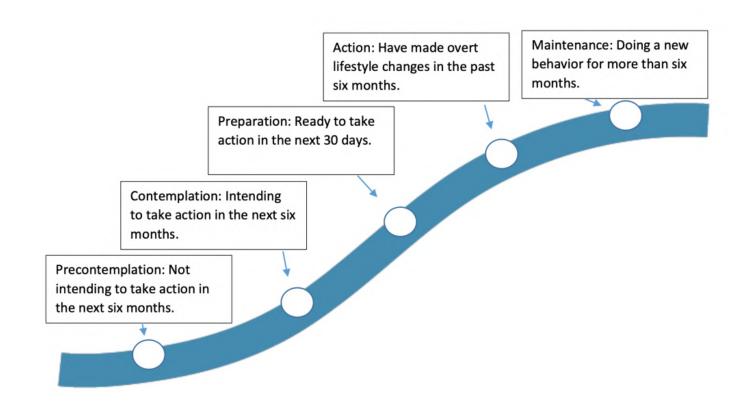
Part IV: Finding out what is stopping Non-Donors

- 1. Reasons
- 2. Thoughts on Rewards

Part V: Level of awareness regarding Blood Donation

- 1. Self-Rating their awareness
- 2. Choosing statements that they know
- 3. Awareness taught in school
- 4. Family's thoughts on donation
- 5. Donor Friends and Family if any
- 6. Awareness regarding the current scenario
- 7. Anyone in need of blood and who helped in that scenario

12.2 Appendix B: Transtheoretical Model of Behavior Change



The Transtheoretical Model of Behaviour Change

12.1 Appendix C: Problem Areas and Opportunities in Detail



For the People

For the Facilities