

The psychosocial factors of blood donation during the pandemic: Strategies for sustainable blood supply

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Abstract: Objectives: The unprecedented COVID-19 pandemic has intensified the stress on blood banks and deprived the blood sources due to the containment measures that restrict the movement and travel limitations among blood donors. During this time, Malaysia had a significant 40% reduction in blood supply. Blood centers and hospitals faced a huge challenge balancing blood demand and collection. The health care systems need a proactive plan to withstand the uncertain situation such as the COVID-19 pandemic. This study investigates the psychosocial factors that affect blood donation behavior during a pandemic and aims to propose evidence-based strategies for a sustainable blood supply. **Study design:** Qualitative design using focus group discussion (FGD) was employed. **Methods:** Data were acquired from the two FGDs that group from transfusion medicine specialists ($N = 8$) and donors ($N = 10$). The FGD interview protocol was developed based on the UTM Research Ethics Committee's approval. Then, the data was analyzed using Nvivo based on the General Inductive Approach (GIA). **Results:** Analysis of the text data found that the psychology of blood donation during the pandemic in Malaysia can be classified into four main themes: (i) reduced donation; (ii) motivation of donating blood; (iii) trends of donation; and (iv) challenges faced by the one-off, occasional, and non-donors. **Conclusions:** Based on the emerging themes from the FGDs, this study proposes four psycho-contextual strategies for relevant authorities to manage sustainable blood accumulation during the pandemic: (1) develop standard operating procedure for blood donors; (2) organize awareness campaigns; (3) create a centralized integrated blood donors database; and (4) provide innovative Blood Donation Facilities.

Keywords: psychosocial factor; blood donation; pandemic; strategy; blood supply; standard operating procedure; blood bank

1. Introduction

1.1. The effects of the pandemic on blood bank

The coronavirus pandemic 2019 (COVID-19) had significant implications for healthcare services. Initial responses to this pandemic in Malaysia, such as lockdowns, stay-at-home orders, movement restriction orders, cancellation of elective and preventive visits to hospitals, as well as the stigma of contracting the virus, have disrupted the operation of different healthcare services in multiple settings, including

blood accumulation and transfusion. While elective procedures were put on hold to deal with the overwhelmed healthcare system, shortages of blood for emergencies and multi-transfused patients were reported from major healthcare centers across many countries (Chiem et al., 2021; Garcia-Lopez et al., 2020).

Besides inventory shortages, blood centres witnessed huge challenges in recruiting blood donors, conducting outdoor blood collection drives, blood utilization, and managing chronically transfused patients, staff, and supplies (Kiely et al., 2021; Kracalik et al., 2021; Ngo et al., 2020; Pagano et al., 2020; Stanworth et al., 2020). Mobile blood connection drives were cancelled as a measure to avoid gatherings and prevent the spread of infection added to the stress of blood centres (Pagano et al., 2020). There was a drastic decrease in the blood donation ratio worldwide, up to 67% reduction (Miskeen et al., 2021). The COVID-19 pandemic has impacted health and social systems worldwide (Uludag, 2022).

1.2. Pandemic and status of blood bank in Malaysia

The blood supply for the Malaysian health system relies mainly on voluntary, non-enumerated blood donors (Wooi, 2017). During the enforcement of the movement control order, blood supply at the National Blood Centre and other blood banks in the country reported a significant 40% reduction, from 111,328 bags (Mac-May 2018) to 67,135 bags (Ministry of Health Malaysia, 2022).

The challenge in blood procurement during the pandemic is not primarily due to COVID-19 but due to the movement restrictions order and social distancing rules, which have prevented the Malaysian public from going to the blood accumulation centres (Tan et al., 2021). Although the blood demand had declined during the movement control order, some patients still required routine and emergency transfusions, including Thalassemia and maternity patients. Furthermore, COVID-19 infections may cause severe complications for pregnant women as they are more susceptible to the risk of preeclampsia-like symptoms, venous thromboembolism, and the severe respiratory manifestation of COVID-19 symptoms.

The COVID-19 pandemic challenged blood donation, supply, and utilization and impacted the seroprevalence of transfusion-transmitted infections. Blood safety is of prime importance, and it is necessary to have proactive measures in place to address such future crises as those witnessed during the pandemic.

1.3. Research objectives

This study aims to identify psychosocial factors that affect blood donation behavior during a pandemic and proposes strategies for authorities to ensure a sustainable blood supply.

2. Material and methods

The study has utilized qualitative methods by focusing on focus group discussion (FGD). Participants in this study were divided into two groups, transfusion medicine specialists ($N = 8$) and blood donors ($N = 10$), who were interviewed in two separate FGDs. The FGD for the blood donors included the one-off, occasional, and non-donors. Given the limited number of participants, potential confounding factors could

influence the information gathered. To mitigate these effects, the FGD interview protocol was developed collaboratively by a committee led by the first author. This protocol included a set of open-ended questions, along with several probing statements, designed to encourage in-depth discussion and to elicit diverse perspectives. The discussions were conducted in Bahasa Melayu, with guiding questions focusing on topics such as the factors influencing donors' decisions to donate or refrain from donating blood during the COVID-19 pandemic, perceptions of the standard operating procedures for blood donation during the pandemic, and the challenges people faced in donating blood during this period.

The decision to use FGDs over other qualitative methods was made to facilitate a dynamic exchange of ideas among participants, enriching the data with collective insights that might not emerge in individual interviews. Furthermore, the General Inductive Approach (GIA) was selected to allow themes to emerge directly from participants' responses, aligning closely with the study's exploratory objectives. The GIA was applied through a structured coding process, where responses were categorized and analyzed to ensure transparency and replicability. Additionally, details about the sampling criteria and recruitment process are provided to enhance representativeness and methodological rigor, ensuring that the sample was relevant and aligned with the study's objectives.

2.1. Analysis

The audio recordings from the focus group discussions were transcribed verbatim and analyzed using NVivo software, with the General Inductive Approach (GIA) as stated by Thomas (2006) is applied to facilitate the coding and interpretation of the data. The analysis involved a structured five-step inductive coding process: (i) an initial reading of the data to become familiar with the content; (ii) identification of text segments related to the psychological aspects of blood donation during the COVID-19 pandemic; (iii) labeling these segments to develop preliminary categories; (iv) refining the categories by reducing overlaps and redundancies; and (v) creating a hierarchical model in the form of a tree diagram to represent the most important categories and themes identified in the data (Thomas, 2006).

Coding verification was conducted to ensure the credibility and reliability of the findings and to validate the consistency of the identified themes. Additionally, participant feedback was sought to confirm that the themes accurately reflected their perspectives, thereby strengthening the validity of the analysis. A diagram illustrating the hierarchical structure of themes and subthemes is included to enhance transparency and provide a clearer overview of the analytical process.

All the questions and quotes presented in this article were translated from Bahasa Melayu to English following the principle of dynamic equivalence (Hatim and Munday, 2019). This translation approach focused on conveying the intended meaning from the original conversations during the FGDs, capturing the closest natural equivalent in English to reflect the true essence of participants' responses (Xiang, 2012). The goal was to maintain the authenticity of the content while ensuring that the translated text accurately represents the participants' experiences beyond a literal translation.

2.2. Ethics

This study was designed to identify the psychosocial framework of blood donors during the pandemic for sustainable blood supply. All ethical considerations and measures were explained in the research procedures submitted to the UTM Research Ethics Committee and have received ethical approval UTMREC-2023-30 (ID: NC-06-23-41).

3. Results

Figure 1 summarizes the themes generated from the GIA analysis. The psychology of blood donation during the pandemic can be understood from four main themes: (i) reduced donation; (ii) motivation of donating blood; (iii) trends of blood donation; and (iv) challenges faced by the one-off, occasional, and non-donors.

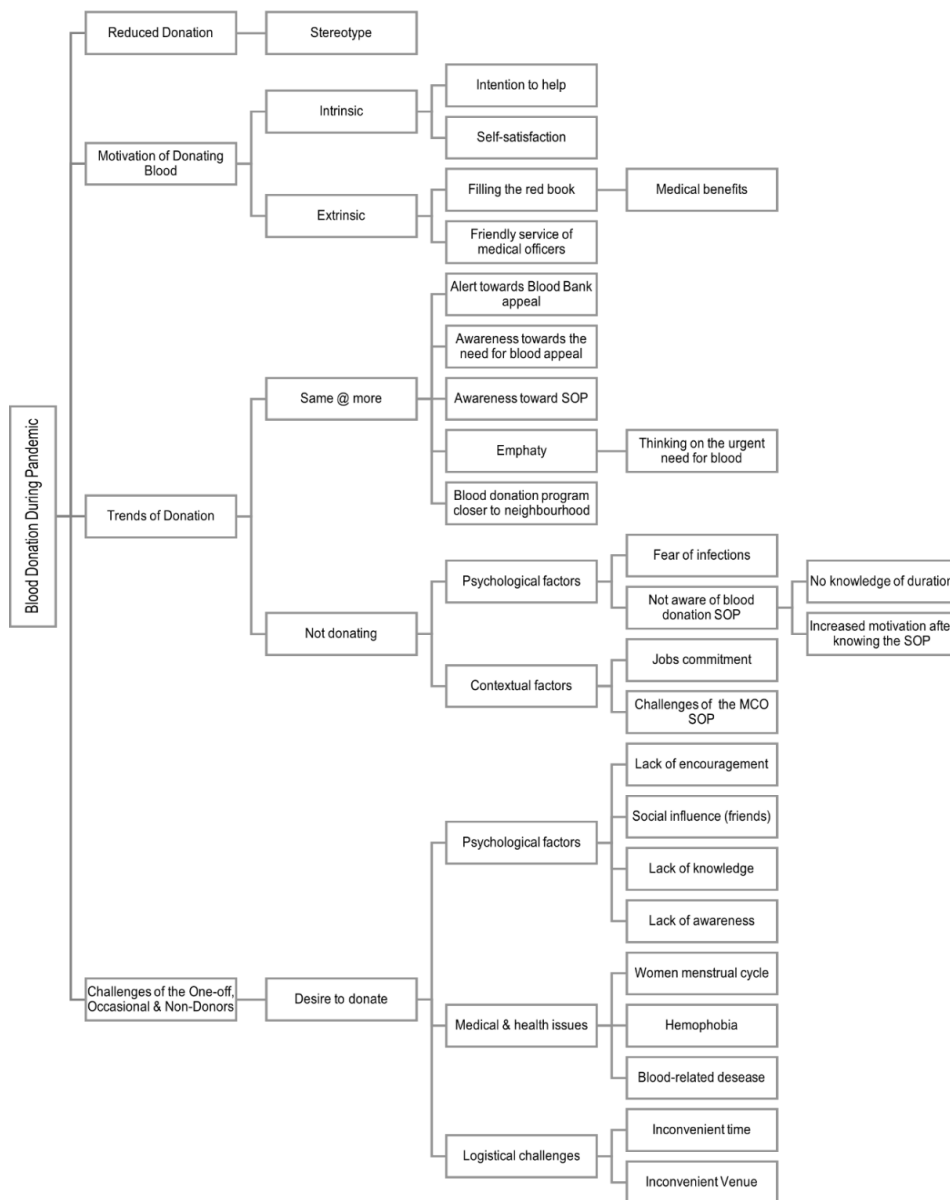


Figure 1. Psychology of blood donation during the pandemic.

3.1. Reduction in blood donation

As expected, both groups affirmed that blood donation activities during the pandemic have reduced significantly. This is apparent among the one-off, occasional, and even regular donors. According to the donors' group:

...I was a regular donor before the pandemic. But, when the pandemic hit in the last two years, I rarely donated my blood. Last year, I didn't donate at all...

The transfusion medicine specialists' group also emphasized the same scenario. The number of people involved in blood donation has reduced, especially during the first phase of the pandemic when the government imposed a very strict movement restriction order. Gradually, more people start to donate again in the recovery stage of the pandemic:

...There was a significant reduction during the first phase of the pandemic. However, people started to return [to donate] during recovery when the government relaxed the standard operating procedure of the movement restrictions order...

In addition, the health officers' group noticed that the stigma people have towards hospitals or health facilities has influenced the reduction in donations. During the early stage of the pandemic, people are afraid of going to medical centers due to the belief that those are the center of infections.

...Early stage of the pandemic, people have a stigma on hospitals as the places where people get COVID-19. Even our frequent donors avoid coming to the hospital...

3.2. Intrinsic motives prevail during the pandemic

Donors' motivation to donate their blood was consistent prior to and during the pandemic. However, intrinsic motives, such as self-satisfaction and desire to help people in need, were more prominent during the pandemic. Participants stressed that:

...I feel satisfied when I can donate blood. Maybe I can't help others financially or offer other forms of help...

Donors' intention to help others is so strong that it makes them resistant to challenges and difficulties and willing to exert extra effort to get involved in blood donation. Besides the intrinsic factors, participants also noted the influence of extrinsic motivation on their intention to commit to blood donation. For example, the donors' group highlights the friendly service provided by the transfusion medicine specialists during the donation process, encouraging them to continue donating blood:

...What makes me happier is the friendliness of the doctors and nurses [at the donation center] while attending to us during the process. It motivates more people to donate their blood...

Medical benefits from blood donation also serve as an important extrinsic factor that motivates them. Although not directly, donors in Malaysia will be issued a book that records their history of blood donation. Regular donors (based on their history of donation) will receive medical benefits from the government health facilities, such as being exempted from treatment fees and qualified to be treated in the second-class ward without charge. These benefits attract people to be an active donor:

...I like to catch up with the stamp in the red book [blood donation book]. When we get to a certain amount of donation, we are entitled to certain medical benefits... This is one of my motivations to donate blood every year so that I will receive those benefits...

Interestingly, some participants regard getting the stamp in the donation book, even without the medical benefits, as motivating.

...Since I am a government servant, I am already entitled to most medical benefits. But still, when I go for blood donation, I don't even think about all the benefits or incentives I will get from donating... I like seeing my red book stamped...

3.3. Donation trends during the pandemic

Discussions with regular blood donors identified two donation trends during a pandemic: donors who keep on donating as usual and sometimes donate more and donors who stop donating during a pandemic. Participants who have been donating more during the pandemic highlighted:

...Last year, I donated 13 times. Sometimes, every two weeks, I will call the hospital to ask whether they need my blood because an apheresis donation does not last long. Usually, the hospital will call me when I need to. Sometimes, almost every day, I call them (the hospital) during the pandemic...

Data analysis identified contextual and psychological factors that influence the consistency of blood donation behavior during a pandemic. Both groups admitted that blood donation programs organized in the people's neighborhoods encourage people to donate even during a pandemic. This kind of program solves many problems incurred by the pandemic standard operating procedure:

...I was part of Rukun Tetangga [Neighborhood Association]. We organized blood donation drives in our neighborhood... We had the opportunity to donate last year without going through all of the roadblocks, and no need to go to the hospital...

Participants also highlighted four psychological factors influencing blood donation commitment during the pandemic. First, participants expressed the sign of high empathy towards people or patients who may need blood during the pandemic:

...I will put effort into making sure I can still donate.... I keep thinking, if there is insufficient or no blood, what will happen to the patient...

Secondly, blood donors during the pandemic demonstrated awareness of the need for blood regardless of time or situation. Their awareness makes them willing to keep on donating blood:

...I saw the blood donation schedule in Johor Bahru on Facebook. From there, I donate every three months, even during the pandemic, to contribute to the blood bank...

Thirdly, donors who donate blood during a pandemic are always alert to the appeal for blood from blood centres or hospitals. Usually, these donors follow or subscribe to the centre's/hospital's social media platforms (such as WhatsApp and Facebook). For example:

...I received a WhatsApp message from the hospital and was alerted to their appeal. 'Help!!! Our hospital is out of blood' ... I straightly register my name and get the appointment date and time...

Fourthly, participants still active with blood donation drives during the pandemic knew the special standard operating procedure for blood donation. They do not face problems acquiring permission to travel to the donation centre/hospital or being afraid for their safety during the donation process. Responding to the question on this matter, active donors responded:

...Yes, I read it on the National Blood Bank's Facebook page [the standard operating procedure of blood donation]... There are changes on the standard operating procedure. We will be safe from other donors, and all donors will be screened for temperature, health conditions, etc...

In contrast to the first trend, some of the regular donors before the pandemic stopped donating when the pandemic happened. There are five main reasons why these donors stopped donating during the pandemic, which can be categorized into psychological and contextual factors. The first psychological factor that hinders these donors is fear of COVID-19 infection. Both groups highlighted this issue, according to the transfusion medicine specialists' group:

...The main challenge of blood accumulation during the pandemic is that people fear donating blood because of infections...

The donors group also raised the same concern. Some of the regular donors stop donating because of this fear:

...People don't go out to donate blood because they are afraid of getting infected...

Another psychological factor that influences blood donors to stop donating during the pandemic is the lack of awareness regarding blood donation standard operating procedure during this time. Awareness of blood donation standard operating procedure during the pandemic is an important motivational factor. Donors admit that their motivation to resume donating has increased after knowing about the standard operating procedure:

...Listening to the other donors' and doctors' sharing inspired me to resume donating blood...

Besides the psychological factors, contextual factors also play an important role in regular donors' decision to stop donating blood during the pandemic. One of the main challenges is the standard operating procedure during the pandemic. Like many other countries, the Malaysian government has enforced the movement control order to curb the spread of COVID-19. The order had multiple phases with various degrees of restrictions, mostly centered around movement restrictions. This standard operating procedure had served as a daunting challenge to the blood donors to go to the donation center:

...Besides that, we also call the donors. Because many of them are worried about the roadblock (movement control order). So, we created a Google form. When the donors fill it out, they will receive a permission slip to go to the hospital for blood donation. After that, donors started to come back...

Another contextual challenge faced by the donors during the pandemic is their work commitments.

...One of the demotivating factors that stopped me from donating blood during the pandemic was work commitments and time constraints...

3.4. Challenges of the one-off, occasional, and non-donors during pandemic

Analysis of the text data identified a similar pattern between the non-donors, one-offs, and the occasional blood donors. They have indicated their desire to donate but still failed to do so due to various psychological, health, and logistical challenges.

...Time is one of the contributing factors for me to donate blood because I will often only come across blood donation programs unexpectedly...

Four psychological barriers identified among this group influenced their non-donating behavior. The first one is the lack of knowledge about blood donation.

... I heard and read about donating blood-saving lives, and this tagline is important for blood donation drives. But again, I need to know more about how it helps...

The second psychological factor is the lack of awareness about the need for and importance of blood donation, especially among non-donors:

...If you ask me, I don't have experience donating blood before this. I don't have an awareness of the importance of donating blood.

In addition, lack of encouragement and social influence among friends was also noted as one of the reasons among the non-donors:

... The encouragement to donate is relatively low. Usually, I only donate blood if my friends ask...

One-off and occasional donors also highlighted the logistical issues that affected their donation behavior before and during the pandemic. The place and time of donation are not convenient for them when they are involved in blood donation activities. Transfusion medicine specialists concern also served as important factors that hinder one-off and occasional donors from donating blood before and during the pandemic. For instance, one of the one-off donors stated that she did not realize that she had homophobia until she went to donate her blood:

...I have never donated my blood because I am homophobic. I have an excessive fear of seeing blood...

In conclusion, the FGD's text data analysis discovered seven themes across two categories of psychological factors and four contextual factors related to blood donation trends during the pandemic. Stereotypes, fear of infection, lack of awareness and knowledge, and social influence are the psychological barriers that negatively affect blood donation intention and behavior. In addition, inconvenient times and places, work commitments, and standard operating procedure also showed similar effects. However, regular donors who kept donating during the pandemic demonstrated a high level of empathy and awareness, driven by their intrinsic motivation.

4. Discussion

This study focuses on the psychosocial factors influencing blood donation behavior during the COVID-19 pandemic in Malaysia (Ministry of Health Malaysia,

2022), shedding light on both psychological and social-contextual challenges that contributed to reduced donation rates. The unprecedented COVID-19 crisis significantly strained blood supplies in Malaysia and globally as stated by Cai et al. (2020) that highlight similar stressors on blood donation systems during crises, with factors such as fear of infection, movement restrictions, and limited awareness acting as barriers to donation. By situating our findings within the broader literature, we reinforce the need for targeted interventions to sustain blood donation during emergencies.

The study identifies four key strategies to enhance blood donation sustainability during pandemics: (1) developing a standard operating procedure for blood donors; (2) organizing awareness campaigns; (3) creating a centralized integrated blood donors database; and (4) providing innovative blood donation facilities. These recommendations are drawn directly from the psychological and contextual challenges identified in the focus group discussions, reflecting both practical needs and psychosocial insights. **Table 1** provides a summary of how these themes informed our proposed strategies.

Table 1. Blood accumulation strategies during pandemic.

Related Themes	Important Issues	Strategy
Standard Operating Procedure (SOP)	<ul style="list-style-type: none"> • General movement restrictions order • Roadblocks • Compound 	Special SOP for blood donors during pandemic/Movement Restriction Order SOP's Content: <ul style="list-style-type: none"> • Policy • Eligibility Criteria • Process • Conditions for travelling permission
Psychological challenges	<ul style="list-style-type: none"> • Stigma • Anxiety/fear of infections • Lack of knowledge • Lack of awareness 	Awareness campaign Content: <ul style="list-style-type: none"> • Status of blood reserve/bank • The needs & importance of blood donation • The risk of low/minimum donation • Benefit of donation • SOP during pandemic • Process of donation • Location, date, and time Medium: <ul style="list-style-type: none"> • Mainstream media • Social media (Facebook, Instagram, Websites, Twitter, TikTok, etc.)
Characteristics of Regular Donors during Pandemic	High intrinsic motivation: <ul style="list-style-type: none"> • High empathy • High awareness • High readiness • High initiative 	Centralized Blood Donors Database: <ul style="list-style-type: none"> • Register by hospitals for regular donors • Accessible by authorities and enforcement agencies • Information of entitled privileges and benefits
Logistical issues	<ul style="list-style-type: none"> • Movement control order • Inconvenient time and place • Travelling limitations 	Innovative Blood Donation Facilities: <ul style="list-style-type: none"> • Mobile blood donation facilities at public residentials • Drive-through blood donation service • Satellite blood donation facilities –avoid mixing with hospital patient

4.1. Blood donation standard operating procedure during the pandemic

COVID-19 caught healthcare services worldwide unprepared, highlighting the lack of proactive strategies in many countries (Raturi and Kusum, 2020). Our focus

groups urgently need a standard operating procedure for blood donation during crises, particularly one that accommodates travel permissions for donors. Such a standard operating procedure should clarify policies, eligibility criteria, and processes, address potential uncertainties, and facilitate safe access to donation centers. This recommendation aligns with previous research advocating structured protocols to support blood donation efforts during pandemics.

4.2. Awareness campaign

Awareness campaigns have been reported to have positive effects on blood accumulation prior (Avau et al., 2018) and during the pandemic (Raturi and Kusum, 2020; Al-Riyami et al., 2021). The content of the awareness program should include the status of the blood bank, the needs and importance of blood donation, the risk of low/minimum donation, standard operating procedure during the pandemic, the process of donation, and the location, date, and time of donation. Furthermore, the medium of this campaign should also penetrate the new media. Besides as stated by Syeldy et al. (2020) and Al-Riyami et al. (2021) that the mainstream media (e.g., television, radio, billboard, etc.), FGDs and previous studies have stated the effectiveness of social media (e.g., Facebook, Instagram, Twitter, TikTok, etc.) in conveying information and enhancing awareness towards blood donation and its standard operating procedure. Leveraging these platforms may help counter misinformation, engage a broader and motivate donations in real-time.

4.3. Centralized blood donors database

One of the standout findings of the FGDs is the high level of empathy and motivation among the regular donors who keep donating during the pandemic. These donors showed a high level of readiness and took the initiative to keep donating. Authorities should leverage this advantage by creating a centralized integrated blood donors database to ensure constant communication and updated information. Registration of the donors should be carried out by the hospitals or blood center and accessible by the relevant authorities. This can be a main reference for enforcement agencies during the pandemic for travel permission, privileges, and service benefits. This centralized database concept will strengthen blood donor management, including evidence-based selection for donor eligibility criteria, scheduling and follow-up for donation appointments, results notification, and donor service and care (Shi et al., 2014).

4.4. Innovative blood donation facilities

The present study recommends that the relevant authorities provide innovative blood donation facilities to overcome logistical issues. These issues restrict the Malaysian public from donating blood during the pandemic, such as the standard operating procedure of movement control order, inconvenient time and place, and travel limitations. The proposed facilities would bring the blood accumulation facilities closer to the donors' residential places and outside of the crowded hospital, such as mobile blood donation facilities that can efficiently go to places, drive-through blood donation facilities which the donors can stay in their vehicles while donating

blood, and satellite blood donation facilities to avoid mixing with hospitals patients and visitors. The establishment and location of satellite facilities can be enhanced using the Tabu search heuristic, Minimax facility location model, and Bayesian Belief Network (Sharma et al., 2019). Applying these techniques is thought to maximize satellite facilities' outreach, effectiveness, and efficiency and demonstrate a near-optimal level of cost-efficiency.

4.5. Awareness campaign

While this study offers valuable insights, it is essential to acknowledge its limitations. The qualitative nature and limited sample size may restrict the generalizability of the findings, as they primarily reflect the experiences of specific groups in Malaysia. Future research with larger, diverse samples could provide a more comprehensive understanding of blood donation behaviors across different contexts. Despite these limitations, our findings contribute to the understanding of psychosocial factors in blood donation and offer practical strategies for bolstering blood supplies during crises.

5. Conclusion

The data analysis from two focus group discussions confirmed a decline in blood donation and supply trends during the COVID-19 pandemic, posing significant challenges to the optimal functioning of healthcare systems during this critical period. To address this issue, the present study proposed four targeted strategies aimed at ensuring a sustainable blood supply. These strategies are designed to overcome specific psychological, logistical, and procedural barriers identified in the discussions. By implementing a specialized Standard Operating Procedure for blood donation, organizing targeted awareness campaigns, establishing a centralized blood donors database, and providing innovative blood donation facilities, authorities can support a more resilient blood donation system during emergencies.

These recommendations hold substantial implications for public health policy, particularly in strengthening blood donation systems under crisis conditions. Fostering a culture of proactive blood donation preparedness will require political commitment, resource allocation, and strategic planning. Additionally, we highlight the need to engage with blood donors who exhibit high intrinsic motivation, empathy, and awareness, as this unique group of individuals is likely to contribute consistently even during challenging times. Recognizing and mobilizing these high-motivation donors within a structured framework can significantly bolster emergency blood supplies.

For future research, we suggest longitudinal studies to assess the long-term effectiveness of these strategies and explore how donor behavior evolves across different phases of a crisis. Comparative studies across varied sociocultural contexts would also provide deeper insights into the universal and context-specific factors influencing blood donation behavior. By advancing our understanding through such research, we can refine these strategies to enhance their adaptability and impact in diverse settings, ultimately reinforcing global blood donation systems and improving healthcare resilience in times of crisis.

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