

Effect of Pain Assessment and Targeted Counselling on Blood Donor Experience: A Randomized Controlled Trial

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Abstract

Background: Negative blood donation experiences, including pain, anxiety, and donation-related reactions, may adversely affect donor satisfaction and future donation. Structured pain assessment and targeted counselling may improve the donor experience.

Aim: To evaluate the effect of pain assessment and targeted counselling on pain perception and donation-related experiences among voluntary blood donors.

Methods: A single-blinded randomized controlled trial was conducted among 208 male voluntary blood donors at a tertiary care hospital. Participants were allocated equally to a control group receiving standard care (n = 104) and an intervention group receiving targeted counselling (n = 104). Pain perception and donation-related reactions were assessed using the Verbal Rating Scale (VRS), Faces Pain Scale (FPS), and Blood Donation Reactions Inventory (BDRI). Data were analyzed using IBM SPSS Statistics version 21.

Results: Donors receiving targeted counselling reported lower perceived pain than controls. Using the VRS, mild, moderate, and severe pain were reported by 31, 20, and 1 participants, respectively, in the intervention group, compared with 15, 32, and 5 participants in the control group. Similar differences were observed using the FPS. Between-group differences were statistically significant for both VRS ($p = 4.87 \times 10^{-7}$) and FPS ($p = 9.65 \times 10^{-13}$). BDRI assessment showed infrequent donation-related symptoms, with no fainting and only isolated reports of dizziness, weakness, and lightheadedness.

Conclusion: Targeted counselling combined with standardized pain assessment was associated with lower perceived pain and an improved blood donation experience. These approaches may be incorporated into routine donor care to enhance donor satisfaction.

Keywords: Blood donors, Blood donation experience, Blood donor retention, Pain assessment, Targeted counselling, Randomized controlled trial.

Introduction

Maintaining an adequate and sustainable blood supply depends not only on the recruitment of new voluntary blood donors but also on the retention of existing donors. Repeat voluntary donors play an important role in ensuring a stable blood supply, particularly in healthcare systems where the demand for blood and blood components continues to increase. Global disparities in blood availability and access further emphasize the importance of strategies that encourage eligible donors to return for subsequent donations.[1]

The experience of blood donation can influence a donor's willingness to donate again. Although blood donation is generally safe and well tolerated, venipuncture-related pain, fear, anxiety, discomfort, and other unpleasant donation-related experiences may negatively affect donor satisfaction and future donation behaviour. Previous studies have demonstrated that interventions addressing donor fears and concerns can improve the donation experience and reduce venipuncture-related pain.[2] Similarly, pain and other adverse experiences during donation have been recognized as factors that may influence a donor's perception of the donation process and subsequent willingness to return.[3]

Pain perception during blood donation is subjective and may be influenced by several factors, including anxiety, previous donation experience, psychological preparedness, and individual perception of venipuncture. Standardized pain assessment tools can provide a structured approach to evaluating donor discomfort and identifying individuals who experience negative reactions during or following blood donation. The Verbal Rating Scale (VRS) and Faces Pain Scale (FPS) are commonly used categorical instruments for assessing pain intensity, while structured assessment of donation-related symptoms can help identify reactions such as dizziness, weakness, and lightheadedness.[4]

However, assessment alone may not be sufficient to improve the overall donor experience. Communication, reassurance, and appropriate counselling may help reduce anxiety and address misconceptions or fears associated with blood donation. Behavioural and psychological factors have an important influence on blood donation intentions, and interventions designed to address barriers and strengthen donor confidence may

support continued engagement in blood donation.[5] Previous studies have also reported that targeted interventions, including motivational approaches and educational strategies, may improve the likelihood of donor return and retention.[6,7]

Despite the recognized importance of donor experience, relatively limited attention has been directed toward combining standardized pain assessment with targeted counselling as part of a structured intervention during blood donation. Evaluating both the physical perception of pain and the psychological aspects of the donation experience may provide a more comprehensive approach to donor care. Such interventions may be particularly relevant for first-time donors, who may experience greater uncertainty, fear, or discomfort during the donation process.

Therefore, the present single-blinded randomized controlled trial was conducted to evaluate the effect of standardized pain assessment and targeted counselling on pain perception and the overall blood donation experience among voluntary blood donors. The study compared donors receiving routine care with those receiving targeted counselling using the Verbal Rating Scale, Faces Pain Scale, and Blood Donation Reactions Inventory to assess perceived pain and donation-related reactions. The findings may provide evidence for incorporating structured pain assessment and counselling into routine donor care to improve the donation experience and potentially support future donor retention.

Methodology

Study design and setting

This study was designed as a prospective, single-blinded randomized controlled trial to evaluate the effect of structured pain assessment and targeted counselling on pain perception and the overall blood donation experience among voluntary blood donors. The study was conducted over a period of 3 months at a tertiary care hospital blood centre. The study design involved comparison between an intervention group receiving targeted counselling in addition to routine donor care and a control group receiving routine donor care alone. The study design and reporting were developed with consideration of established recommendations for randomized controlled trials.[8]

Study participants

A total of 208 voluntary male blood donors were included in the study. Participants were allocated equally into the intervention group (n = 104) and the control group (n = 104). Eligible donors were recruited from individuals presenting for voluntary blood donation at the study centre during the study period. As the study population consisted exclusively of male donors, the findings should be interpreted within this donor population.

Randomization and blinding

The study employed a single-blinded randomized controlled design. Following recruitment, participants were assigned to either the intervention group or the control group in equal numbers. The intervention group received targeted counselling in addition to routine donor care, whereas the control group received the standard care routinely provided during blood donation.

The procedures used for sequence generation, allocation concealment, and blinding should be described explicitly according to the original study records to ensure transparent reporting of the randomized trial methodology.[8]

Intervention

Donors in the control group received the routine procedures followed at the blood centre. Donors allocated to the intervention group received targeted counselling in addition to routine care. The counselling intervention was intended to address donor concerns, improve understanding of the blood donation procedure, and provide information regarding the expected sensations associated with donation.

The intervention was implemented during the 3-month study period, and pain perception and donation-related reactions were subsequently assessed and compared between the two study groups.

Assessment of pain and donation-related reactions

Pain perception and donation-related experiences were assessed using standardized instruments, including the **Verbal Rating Scale (VRS)**, **Faces Pain Scale (FPS)**, and the Blood Donation Reactions Inventory (BDRI). These instruments were used to evaluate the subjective experience of pain and donation-related reactions among participants in the control and intervention groups.

The VRS provides a categorical assessment of pain intensity, while facial pain scales provide a visual representation that facilitates communication of perceived pain.[9,10] The BDRI was used to assess donor reactions associated with the blood donation process.[11]

Pain and donation-related responses were collected and compared between the two groups to determine whether targeted counselling was associated with differences in perceived pain and the overall blood donation experience.

Outcome measures

The primary outcome of the study was the difference in reported pain perception between donors receiving targeted counselling and those receiving routine care, as assessed using the VRS and FPS.

Secondary outcomes included differences in donation-related reactions assessed using the BDRI and comparison of donor responses between the intervention and control groups.

Statistical analysis

The collected data were analyzed using IBM SPSS Statistics version 21. Descriptive statistics were used to summarize donor characteristics and the distribution of pain and donation-related responses. Categorical variables were presented as frequencies and percentages. Comparisons between the intervention and control groups were performed using appropriate inferential statistical tests for categorical data. A two-sided p value of less than 0.05 was considered statistically significant.

Results

Participant distribution

A total of 208 voluntary male blood donors were included in the study and were equally allocated to the intervention and control groups, with 104 participants in each group. Within both groups, donors were further categorized according to their previous donation status as first-time or repeat donors. Pain perception and donation-related reactions were assessed using the Verbal Rating Scale (VRS), Faces Pain Scale (FPS), and Blood Donation Reactions Inventory (BDRI).

Verbal Rating Scale assessment

The distribution of pain intensity according to the Verbal Rating Scale is presented in Figure 1. No participant reported complete absence of pain during blood donation. The majority of donors in both the intervention and control groups reported mild pain, although the distribution of responses varied according to previous donation experience.

Repeat donors in both groups predominantly reported mild pain, whereas a relatively greater proportion of first-time donors reported moderate pain. Severe pain was reported only by a small number of participants across the study groups. Overall, the findings indicate that most blood donors experienced either mild or moderate discomfort during the donation procedure, with severe pain being uncommon.

The distribution of pain scores also suggested differences between first-time and repeat donors, indicating that previous donation experience may influence the perception and reporting of pain. The intervention group showed a generally favourable distribution of pain responses when compared with the control group, supporting the potential benefit of targeted counselling in improving the donor experience.



Figure 1. Verbal Rating Scale assessment of pain perception among blood donors.

Faces Pain Scale assessment

Pain perception was further evaluated using the Faces Pain Scale, as shown in Figure 2. Similar to the findings obtained using the Verbal Rating Scale, the majority of donors reported pain within the lower-to-moderate range of the scale.

The distribution of responses demonstrated variation between first-time and repeat donors. First-time donors showed a greater tendency toward moderate pain scores, whereas repeat donors were more frequently

represented within the lower pain categories. Only a limited number of donors reported scores corresponding to severe discomfort.

The overall pattern observed using the Faces Pain Scale was consistent with the findings obtained using the Verbal Rating Scale, indicating agreement between the two approaches used to assess subjective pain perception. These findings suggest that donor counselling and previous donation experience may contribute to differences in the perceived intensity of pain during blood donation.

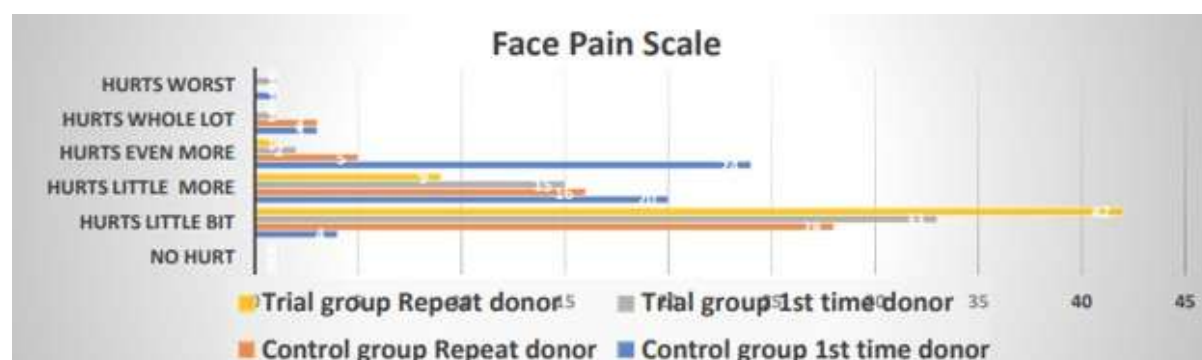


Figure 2. Face Pain Scale assessment of pain perception among blood donors.

Comparison of pain assessment scales

The Verbal Rating Scale and Faces Pain Scale demonstrated broadly comparable patterns in the assessment of donor pain. In both assessment methods, the majority of participants reported mild-to-moderate discomfort, while severe pain was uncommon.

The use of two complementary pain assessment instruments provided a broader evaluation of the subjective donor experience. The VRS enabled participants to categorize their pain verbally, whereas the Faces Pain Scale provided a visual representation of pain intensity. The Wong-Baker Faces Pain Rating Scale used for pain assessment is illustrated in **Figure 3**.

Wong-Baker FACES Pain Rating Scale



Figure 3. Wong-Baker FACES Pain Rating Scale.

Blood Donation Reactions Inventory assessment

Donation-related reactions assessed using the Blood Donation Reactions Inventory are presented in Table 1. Overall, adverse donation-related symptoms were infrequent among the study participants.

No cases of fainting were reported among either first-time or repeat donors. Dizziness was reported by only one first-time donor (0.96%), while weakness was reported by one first-time donor and one repeat donor. Similarly, lightheadedness was reported by one participant from each donor category.

These findings indicate that clinically significant adverse reactions were uncommon during the study period. The low frequency of donation-related symptoms suggests that the blood donation procedure was generally well tolerated by both first-time and repeat donors.

Table 1. Distribution of blood donation-related reactions among first-time and repeat donors.

Blood donor group	Faint, n (%)	Dizziness, n (%)	Weakness, n (%)	Lightheadedness, n (%)
First-time donors	0 (0.0)	1 (0.96)	1 (0.96)	1 (0.96)
Repeat donors	0 (0.0)	0 (0.0)	1 (0.96)	1 (0.96)

Note: Distribution of self-reported blood donation-related reactions among first-time and repeat blood donors, assessed using the Blood Donation Reactions Inventory (BDRI). Before final submission, please verify the denominator used to calculate 0.96%. If the percentage is calculated from the total sample of 208 donors, then $1/208 = 0.48\%$, not 0.96%. If it is calculated using a subgroup denominator of 104 donors, then $1/104 = 0.96\%$.

Overall findings

Overall, the results demonstrated that the majority of blood donors experienced mild-to-moderate pain during the blood donation procedure, while severe pain was reported only infrequently. The findings obtained using the Verbal Rating Scale and Faces Pain Scale showed a similar overall pattern of pain perception.

Differences in pain responses were observed according to donor experience, with repeat donors generally showing a greater tendency toward lower pain categories compared with first-time donors. Furthermore, donation-related adverse reactions were minimal, with no cases of fainting and only isolated reports of dizziness, weakness, and lightheadedness.

Collectively, these findings provide an overview of pain perception and donation-related reactions among voluntary blood donors and support the potential value of structured pain assessment and targeted counselling in improving the overall blood donation experience.

Discussion

The present prospective, single-blinded randomized controlled study evaluated whether structured pain assessment and targeted counselling could influence pain perception and blood donation-related reactions among voluntary male blood donors. The findings demonstrated differences in the distribution of donor-reported pain between the intervention and control groups, as assessed using both the Verbal Rating Scale (VRS) and the Wong-Baker FACES Pain Rating Scale. Overall, most donors reported pain within the mild-to-moderate range, while severe pain was uncommon. These findings suggest that blood donation is generally associated with a low-to-moderate level of perceived discomfort, although the individual experience may vary according to factors such as previous donation experience and the supportive measures provided during the donation process.

The VRS findings showed variation in pain perception between first-time and repeat donors in the control and intervention groups. First-time donors appeared to report pain differently from repeat donors, which may reflect greater familiarity with the blood donation procedure among individuals with previous donation experience. First-time donors may experience greater apprehension regarding venepuncture and the donation procedure because of unfamiliarity and uncertainty. Previous studies have identified fear, anxiety, anticipated pain, and negative expectations as important factors influencing the blood donation experience and willingness to return for subsequent donation.[12,13]

An important aspect of the present study was the use of targeted counselling in the intervention group. Appropriate pre-donation communication and counselling may help donors understand the procedure, anticipate the sensations associated with venepuncture, and reduce uncertainty. Even when the physical stimulus associated with venepuncture remains unchanged, the donor's interpretation and perception of the procedure may be influenced by psychological preparation and reassurance. Previous research has emphasized the importance of donor education, communication, and positive donation experiences in reducing anxiety and promoting future blood donation behaviour.[14,15]

The findings obtained using the Wong-Baker FACES Pain Rating Scale were generally consistent with those obtained using the VRS, supporting the usefulness of structured pain assessment for evaluating the subjective donation experience. The use of more than one pain assessment approach may provide complementary information because donors differ in their ability and preference to describe pain verbally or visually. Standardized pain assessment tools have been widely used to facilitate the measurement and comparison of subjective pain intensity across clinical settings.[16,17]

Blood donation-related reactions were infrequent in the present study. No episodes of fainting were recorded, while isolated reports of dizziness, weakness, and lightheadedness were observed among first-time and repeat donors. Considering the subgroup size of 104 donors, each individual reaction represented approximately 0.96% of the respective donor group. The low frequency of adverse donor reactions indicates that blood donation was generally well tolerated in the study population. This observation is consistent with the broader understanding that most blood donation-related reactions are mild and self-limiting, although careful donor assessment, monitoring, and appropriate post-donation care remain essential for donor safety.[18,19]

The findings also highlight the potential importance of donor experience. Repeat donors may be more familiar with the donation environment and procedure, which could contribute to a more predictable perception of pain

and discomfort. Conversely, first-time donors may benefit particularly from clear explanations and targeted counselling before donation. Improving the initial donation experience is important because an unpleasant or anxiety-provoking first donation may negatively influence the likelihood of future blood donation, whereas a positive experience may encourage donor retention.[13–15]

From a practical perspective, the present findings support the incorporation of structured communication and pain assessment into routine blood donor care. These approaches are relatively simple and can potentially be implemented without substantial additional resources. Identification of donors experiencing greater anxiety or discomfort may also allow blood centre personnel to provide individualized reassurance and supportive care.

Nevertheless, the findings should be interpreted in light of certain limitations. The study included only male voluntary blood donors and was conducted at a single tertiary care blood centre; therefore, the findings may not be generalizable to female donors or to other donor populations and settings. In addition, pain perception is inherently subjective and may be influenced by psychological and situational factors that were not independently measured. Further multicentre studies involving larger and more diverse donor populations are required to confirm the effectiveness of targeted counselling and to evaluate its potential influence on donor satisfaction, adverse reactions, and long-term donor retention.

Overall, the present study indicates that structured pain assessment combined with targeted counselling may contribute to an improved understanding of the blood donation experience. Most donors reported mild-to-moderate pain, severe pain was uncommon, and blood donation-related reactions were infrequent. These findings support the value of incorporating donor-centred communication and standardized assessment of pain and donation-related reactions into routine blood donor care.

Limitations of the Study

This study has certain limitations that should be considered when interpreting the findings. First, the study was conducted at a single tertiary care hospital blood centre, which may limit the generalizability of the results to other blood donation settings. Second, the study population consisted exclusively of male voluntary blood donors; therefore, the findings may not be directly applicable to female donors or other donor populations. Third, pain perception and donation-related symptoms are subjective and may be influenced by individual psychological factors, including anxiety, fear, previous donation experiences, and expectations, which were not independently assessed in the present study.

In addition, the study evaluated outcomes during the immediate blood donation period and did not assess longer-term outcomes such as donor satisfaction, intention to donate again, or actual repeat donation behaviour. The relatively limited sample size may also have reduced the ability to detect small differences in less frequent donation-related reactions. Future multicentre studies involving larger and more diverse donor populations, including both first-time and repeat donors of different sexes, are needed to further evaluate the effectiveness of targeted counselling and structured pain assessment on donor experience, adverse reactions, and long-term donor retention.

Conclusion

The present study demonstrated that structured pain assessment and targeted counselling can contribute to a better understanding and management of the blood donation experience. Most participants reported mild-to-moderate pain, while severe pain and clinically significant donation-related reactions were uncommon. The use of both the Verbal Rating Scale and the Faces Pain Scale provided complementary assessment of donor-reported pain.

The findings further suggest that donor experience and targeted counselling may influence the perception of pain and discomfort during blood donation. Incorporating clear pre-donation communication, appropriate counselling, and structured assessment of donor discomfort may therefore represent practical approaches to improving donor-centred care. The low frequency of dizziness, weakness, lightheadedness, and absence of fainting also indicate that blood donation was generally well tolerated in the study population.

Overall, structured pain assessment combined with targeted counselling may be a simple and feasible strategy for enhancing the blood donation experience. Further large-scale multicentre studies are warranted to confirm these findings and to determine their potential impact on donor satisfaction and long-term donor retention.

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Conflicts of interest

There are no conflicts of interest.

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