

Reintegrating Temporarily Deferred Blood Donors through a Donor Wellness Clinic: A Mixed Design Implementation Study from a Tertiary Care Centre in North India

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ABSTRACT

Background: Pre-donation health screenings safeguard blood transfusion safety but routinely lead to donor deferrals. Without structured post-screening care, temporary deferrals frequently result in permanent donor loss. The Donor Wellness Clinic (DWC) framework aims to address this gap by offering structured clinical counselling, targeted medical management, and organised reassessment to restore donor eligibility.

Aims: To evaluate whole-blood donor deferral patterns, assess stakeholder readiness, and measure the operational feasibility, workflow, and re-entry performance of an institutional DWC intervention.

Methods: This was a three-phase mixed-design implementation study conducted from September 2023 through June 2025. Phase 1: retrospective audit of registered blood donors (N = 6,678) screened between September 2023 and June 2024 to determine the prevalence and causes of donor deferral according to Directorate General of Health Services (DGHS) guidelines.

Phase 2 (Needs Assessment Survey): Cross-sectional survey (N = 49; 30 active/deferred donors, 12 medical officers, 7 laboratory technicians) evaluating institutional readiness for an on-site DWC.

Phase 3 (DWC Implementation & Follow-up): Prospective single-arm implementation of the DWC pathway from August 2024 through June 2025 (n = 258 registered temporary deferrals) offering clinical counselling, protocolized medical management (including oral iron for low haemoglobin), and scheduled reassessments.

Results: In Phase 1, 725 of 6,678 registered donors were deferred (overall deferral rate: 10.86% [725/6,678]). Modifiable temporary causes accounted for 69.38% (503/725) of all deferrals, led by low haemoglobin (43.86%, 318/725) and elevated blood pressure (20.55%, 149/725), while permanent causes accounted for 30.62% (222/725). In Phase 2, 80% (39/49) strongly supported establishing an on-site DWC. In Phase 3, 258 temporarily deferred donors were registered, of whom 151 (58.53%, 151/258) attended DWC consultations. Following management, 18 donors fulfilled eligibility criteria and successfully donated blood, yielding a reintegration rate of 11.92% (18/151) among counselled DWC attendees and 6.98% (18/258) across all registered temporary deferrals.

Conclusion: The Donor Wellness Clinic provided a feasible structured pathway for post-deferral counselling and reintegration. Low haemoglobin and elevated blood pressure were the primary modifiable barriers. Structured clinical management and scheduled follow-up were associated with successful return of a subset of temporarily deferred donors to the active donor pool.

Keywords: Blood donor deferral, Donor wellness clinic, Anaemia, Hypertension, Reintegration rate, Donor retention, Feasibility study.

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1. INTRODUCTION

Maintaining a stable, safe blood supply relies on voluntary and replacement blood donations. Pre-donation health

screening ensures donor safety and blood product quality, but it creates operational bottlenecks when donors are deferred. Beyond the immediate loss of collectable units,

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unmanaged temporary deferrals cause donor dissatisfaction and permanent attrition.

In Northern India, modifiable conditions such as low haemoglobin, transient hypertension, medication history, and recent alcohol intake account for the vast majority of temporary deferrals^{1,2}. Standard blood collection centres operate primarily as collection facilities without dedicated pathways for medical counselling, diagnostic workup, or structured follow-up. The Donor Wellness Clinic transforms blood banks into proactive health touchpoints that provide medical management, lifestyle advice, and organized reassessment to restore eligibility. This study evaluates the operational feasibility and re-entry performance of a 3-phase DWC framework at a tertiary care centre in North India.

2. AIMS AND OBJECTIVES

Primary Aim: To evaluate the operational feasibility and re-entry performance of an institutional Donor Wellness Clinic in reintegrating temporarily deferred blood donors.

Specific Objectives:

1. Determine overall donor deferral patterns and categorize causes into temporary (modifiable) and permanent conditions per DGHS standards.
2. Assess stakeholder perspectives and institutional readiness for an on-site donor wellness framework.
3. Evaluate donor engagement during prospective DWC implementation.
4. Measure monthly donor return rates and successful whole-blood re-donation outcomes over an 11-month follow-up window.

3. METHODOLOGY

Study Design and Setting

This was a sequential mixed-design implementation study comprising a retrospective donor-deferral audit, a cross-sectional stakeholder needs-assessment survey, and a prospective single-arm Donor Wellness Clinic implementation cohort. The study was conducted at the Blood Centre of a tertiary care teaching hospital, operating in accordance with the prevailing Director General of Health Services guidelines for voluntary blood donor selection and management^{1,2}.

Operational Phases

Phase 1 comprised a retrospective audit of all eligible blood donors screened between September 2023 and June 2024 to determine the prevalence and causes of donor deferral. Among the 725 deferred donors identified, 503 (69.38%) had temporary and potentially reversible causes of deferral, whereas 222 (30.62%) presented with non-modifiable clinical conditions, chronic systemic illnesses, or requirements for lifelong medications. These were classified as permanent deferrals and were excluded from re-entry pathways due to clinical ineligibility. The

temporary deferrals (n = 503) presented with transient, modifiable conditions, predominantly low haemoglobin and elevated blood pressure, rendering them potential candidates for health optimisation and reintegration.

Phase 2 consisted of a cross-sectional needs assessment survey conducted among N = 49 key stakeholders, including active and deferred voluntary blood donors (n = 30), medical officers (n = 12), and blood bank laboratory technicians (n = 7). An investigator-developed structured questionnaire assessed perceptions regarding donor deferral, the need for post-deferral medical guidance, institutional readiness, and acceptability of an on-site Donor Wellness Clinic. Content validity was assessed by 3 subject experts before administration.

Phase 3 comprised a prospective implementation phase conducted during the active operational window of the DWC from August 2024 to June 2025. A consecutive cohort of n = 258 temporarily deferred donors with modifiable conditions was enrolled and offered structured clinical management pathways. Donors with anaemia (haemoglobin < 12.5 g/dL) received personalised consultations, dietary counselling, and oral elemental iron supplementation (100 mg daily for 60-90 days) with scheduled follow-up at 8-12 weeks based on their haematological profile²⁹. Donors with transient blood pressure variations received lifestyle counselling, rest-period re-evaluations, or primary care referrals²⁶. Re-entry eligibility was systematically evaluated through repeat pre-donation screening upon clinical resolution of the deferral cause.

Successful donor reintegration was defined as a temporarily deferred donor who subsequently returned for reassessment, fulfilled all prevailing donor eligibility criteria, and successfully completed a whole-blood donation during the study follow-up period. DWC engagement was defined as attendance for at least one clinical consultation following temporary deferral.

Statistical Analysis

Data were analysed using descriptive statistics. Continuous and categorical variables were summarised as absolute counts and percentages. Reintegration success rates were calculated relative to both the DWC consultation attendee cohort (n = 151) and the total prospective temporary deferral cohort (n = 258).

4. RESULTS

Baseline Donor Deferral Audit (N = 6,678)

Among 6,678 screened donors, 725 were deferred, yielding an overall baseline deferral rate of 10.86% (725/6,678). Males accounted for 22.76% of deferrals (165/725, 2.47% of total screened donors), while females accounted for 77.24% of deferrals (560/725, 8.38% of total screened donors). Modifiable (temporary) causes comprised 69.38% (503/725) of all deferrals, while permanent medical causes accounted for 30.62% (222/725).

Table 1: Baseline Causes of Blood Donor Deferral (N = 725)

Cause of Deferral	Classification	Frequency (n)	Percentage (%)
Low Haemoglobin (<12.5 g/dL)	Temporary	318	43.86
Elevated Blood Pressure	Temporary	149	20.55
Recent Alcohol Consumption (<24 h)	Temporary	25	3.45
Medication History	Temporary	11	1.52
Subtotal Temporary Deferrals	Temporary	503	69.38
Cardiovascular Disease	Permanent	87	12.00
Chronic Autoimmune Conditions	Permanent	58	8.00
High-Risk Behavioural History	Permanent	41	5.66
Chronic Liver / Renal Disease	Permanent	24	3.31
Severe Pulmonary Disorders	Permanent	12	1.66
Subtotal Permanent Deferrals	Permanent	222	30.62
Total Deferrals	—	725	100.00

Stakeholder Need Assessment Survey (N = 49)

Phase 2 survey results confirmed strong institutional alignment for establishing the DWC:

- 80.0% (39/49) strongly supported establishing an on-site Donor Wellness Clinic.

- 89.8% (44/49) agreed that deferred donors require structured post-screening medical guidance.
- 75.0% (37/49) emphasised routine health evaluations as essential for retention.
- 70.0% (34/49) believed clinic interventions would increase long-term donation frequency.

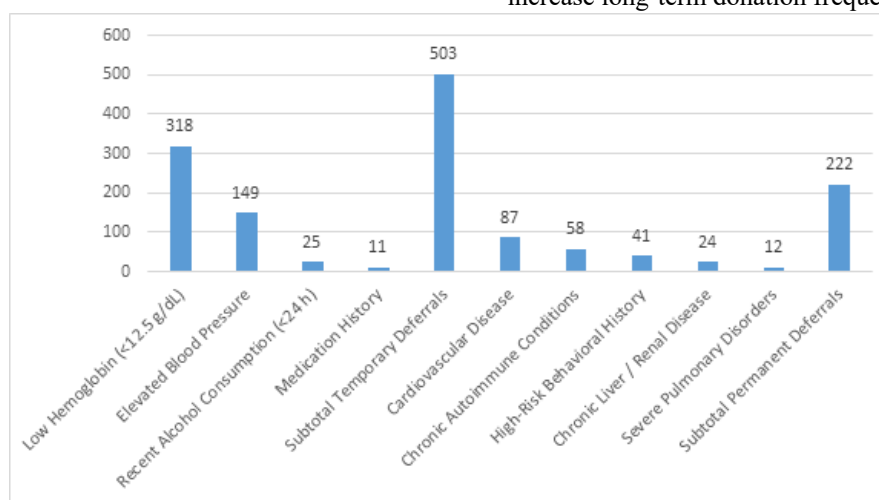


Fig 1: Frequency and Classification of Blood Donor Deferral Causes in the Screening Cohort

DWC Implementation and Reintegration Performance (Phase 3)

During Phase 3, 258 temporarily deferred donors were prospectively registered. Of these, 151 (58.53%) attended

active DWC clinical consultations. Re-entry performance was evaluated by tracking active consultations against successful re-donations per operational month:

Table 2: Monthly DWC Consultations, Re-evaluations, and Re-entry Performance

Month/Year	New Temporary Deferrals (n)	Active DWC Consultations (n)	Donors Returning for Reassessment (n)	Successfully Donated (n)	Re-donation as % of DWC Consultations
Aug-24	25	10	3	2	20.00
Sep-24	42	17	4	1	5.88
Oct-24*	11	24	5	1	4.17
Nov-24	25	18	2	0	0.00
Dec-24	20	8	1	0	0.00
Jan-25	17	14	3	1	7.14
Feb-25	28	11	5	3	27.27
Mar-25	19	12	6	4	33.33
Apr-25	25	13	3	1	7.69
May-25	23	14	4	2	14.29
Jun-25	23	10	5	3	30.00
Total	258	151	41	18	11.92

*In October 2024, consultations (n = 24) exceeded new monthly registrations (n = 11) because consultations include follow-up visits from donors deferred during prior months (August/September 2024).

Monthly re-donation/consultation rate = number of successful blood donations during the month ÷ number of active DWC consultations during the same month × 100.

Overall Reintegration Rates:

Among DWC Attendees: 18/151 = 11.92%

Across All Registered Temporary Deferrals: 18/258 = 6.98%

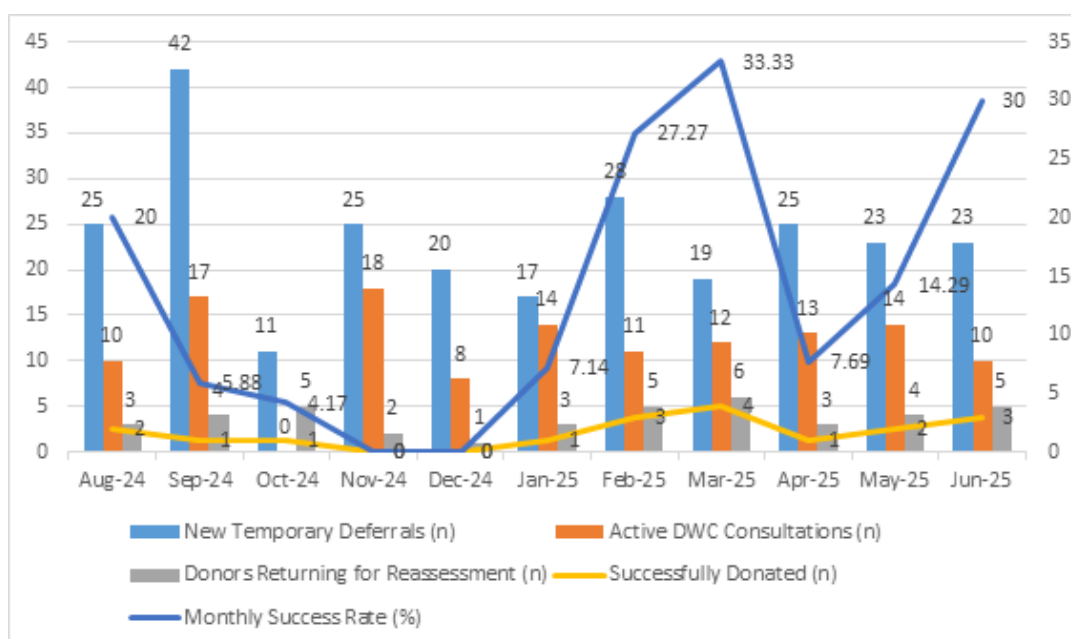


Fig 2: Monthly Trends in Temporary Deferrals, DWC Consultations, Reassessments, and Successful Blood Re-donations (August 2024 - June 2025)

5. DISCUSSION

This study demonstrates that an institutional Donor Wellness Clinic (DWC) is a feasible and clinically productive strategy for engaging temporarily deferred donors and facilitating structured re-entry into the donation pool, addressing a gap in donor retention that is well recognised across Indian and international transfusion medicine literature^{1,2}.

5.1 Deferral Burden and Comparison with Existing Literature

The overall deferral rate of 10.86% recorded in this study is broadly consistent with rates reported from other Indian tertiary-care blood centres, which have ranged between approximately 6% and 15% depending on donor demographics, screening criteria, and regional prevalence of anaemia^{4,6,7,9,12,13,14,20,22,28}. Comparable deferral trends have also been documented internationally, including in Iran⁸, Singapore¹⁸, and Malaysia²³, reflecting the universal operational challenge that pre-donation screening poses to blood collection efficiency even where DGHS-equivalent regulatory frameworks are rigorously applied^{1,2}. The predominance of female deferrals observed in the present cohort (77.24%) mirrors earlier Indian findings describing disproportionately higher deferral rates among female donors, largely attributable to iron-deficiency anaemia⁴.

5.2 Focus on Targeted Interventions and Reintegration

Unlike standard deferral audits that report epidemiological trends without an interventional component, the present study operationalised a structured clinical response. Low haemoglobin (43.86%) and elevated blood pressure (20.55%) together accounted for over 64% of all deferrals, echoing the well-documented dominance of anaemia and transient hypertension as the principal modifiable deferral causes in Indian donor populations^{19,21,26}. Ngoma and Mutombo highlighted the high prevalence of iron-deficiency anaemia among rejected donors and advocated routine referral pathways rather than passive rejection²¹, an approach directly reflected in the DWC's protocolised dietary counselling and oral iron supplementation. Similarly, Sharma and Verma demonstrated that blood-pressure-related deferral could be repurposed as an opportunistic hypertension-screening tool²⁶, consistent with the present study's practice of converting BP-related deferral into outpatient referral and lifestyle counselling rather than a terminal rejection event.

5.3 Contextualising with Recent Literature (2022-2026)

Recent literature underscores the necessity of active, rather than passive, deferral management. Khurram and Chaudhary reported that passive deferral without medical follow-up leads to permanent donor loss, particularly among young anaemic donors¹⁵, a risk this DWC model was specifically designed to mitigate. Uner and Kotsavitou demonstrated, in a randomised controlled study, that structured iron supplementation combined with scheduled follow-up significantly improves haemoglobin recovery compared with passive dietary advice alone²⁹, lending direct support to the protocolised 60-90-day elemental iron regimen and 8-12-week reassessment

window adopted in Phase 3 of this study. Malhotra and Negi emphasised that community-level anaemia burden directly impacts blood bank inventory and advocated for hospital-attached counselling clinics¹⁹, a model that this DWC operationalises within a tertiary-care transfusion setting. Soundharya et al. further observed that temporarily deferred donors represent a highly motivated subgroup who are receptive to targeted health interventions when clear re-entry pathways exist³⁰, a finding corroborated by the 58.53% consultation attendance rate recorded in the present cohort.

The 11.92% reintegration rate achieved among counselled DWC attendees aligns with, and in several instances compares favourably to, reintegration outcomes reported in donor-retention literature. Custer et al., in the large-scale REDS-II donor return study, and Lawson-Ayayi and Salmi both identified structured predictors of donor return following temporary deferral, reinforcing the value of organised follow-up systems^{10,17}. Farrales and Banson's systematic review of interventions to improve donor retention after pre-donation deferral similarly concluded that structured counselling and re-contact strategies meaningfully improve return rates compared with no intervention¹¹, a conclusion mirrored by Spearman and Slot's systematic review of strategies to sustain donor motivation after temporary deferral²⁷. Kouao et al. likewise proposed operational strategies for blood centres to manage and follow up temporarily deferred donors¹⁶, several of which - individualised counselling, scheduled reassessment, and protocolised medical management - form the operational backbone of the DWC described here.

5.4 Physiological Recovery and Re-entry Timing

Re-entry peaks observed in February, March, and June 2025 (monthly success rates of 27.27%-33.33%) may partly reflect the physiological time required for correction of low haemoglobin following iron supplementation, consistent with the recovery timelines described by Uner and Kotsavitou²⁹, although differences in donor composition, adherence, and seasonal attendance patterns may also have contributed. Ranney and Mello's broader conceptualisation of preventive health screening supports reframing donor deferral as an opportunistic health-engagement touchpoint rather than a terminal administrative outcome²⁴, a philosophy underlying the DWC's dual role in donor recovery and incidental health screening.

5.5 Programmatic and Policy Implications

Raturi and Shastry, reviewing deferral management challenges among Indian blood donors, called for structured institutional pathways to convert deferral into an opportunity for donor engagement rather than attrition²⁵; the present findings offer prospective, empirical evidence in support of that recommendation. Given that modifiable causes accounted for nearly 70% of all deferrals in this cohort, consistent with earlier Indian audits^{4,5,6,7,9,12,13,14,20,22,28}, institutional adoption of DWC-

type frameworks may represent a scalable strategy for narrowing the gap between temporary deferral and permanent donor loss, particularly within regionally high-anaemia-burden settings^{3,19}.

Future implementation research should evaluate automated reminder systems, tele-counselling, standardised referral pathways, and structured nutritional interventions as strategies to further improve DWC attendance and successful donor return, building on the technological and behavioural strategies proposed in the broader donor-retention literature^{11,27}.

5.6 Study Limitations

This was a single-centre, non-randomised design without a contemporaneous control group, limiting causal inference regarding the specific effect of the DWC on donor return. Only 58.53% of registered temporarily deferred donors attended DWC consultations, introducing potential self-selection bias, as donors who attended may have been inherently more motivated to return. Additionally, the small absolute number of successful re-donations (n = 18) limited statistical subgroup comparison and predictor analysis.

6. CONCLUSION

The Donor Wellness Clinic framework provides a feasible, structured model for converting temporary blood donor deferrals into voluntary donations. Addressing modifiable barriers, principally low haemoglobin and elevated blood pressure, through clinical counselling, nutritional support, and scheduled reassessments achieved an 11.92% reintegration rate among DWC attendees. These findings support further evaluation of the DWC model in larger multicentre studies to determine whether structured post-deferral follow-up can improve donor retention and blood-supply sustainability.

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