Challenges in Delivering Care for Hematolymphoid Disorders during the COVID-19 Pandemic : Insights from a Tertiary Center in Kerala, India

Manju Rosy Jose[a], Anju Esthapan[a], Anu Sara[a], Brisha Hannah[a], Rohan J Mathew[a], Alice David[a], Chepsy Philip[a]

a. Believers Church Medical College Hospital, Thiruvalla, Kerala, India*

ABSTRACT

Published on 28th March 2025

Background: The COVID-19 pandemic led to significant reallocation of healthcare resources toward emergency care, often at the cost of patients with non-COVID conditions. Individuals with haemato-lymphoid diseases, many of whom are immunocompromised and require continuous, intensive therapy, were particularly at risk. This study aimed to evaluate the impact of the pandemic on the care of patients with hematological diseases in a resource-limited setting in India.

Methods: A cross-sectional study was conducted at the Regional Advanced Centre for Transplantation, Haemato-Lymphoid Oncology and Marrow Diseases (RACTHAM), Believers Church Medical College Hospital, Kerala. All patients who received care between April 1st 2020 and December 31st 2020 were included. Data were gathered through structured interviews during outpatient visits or via telephone. Information on diagnosis, care access, treatment disruptions, follow-up delays, and COVID-19-related outcomes was collected and analysed descriptively.

Results: Among the 505 patients interviewed (mean age 47.95 ± 20.5 years; 50.6% male), 74.3% had benign hematological disorders and 25.7% had malignant conditions. Care disruptions due to the pandemic were reported by 13.5%, while 31.3% reported shifting their primary treatment center. Follow-up visits were affected in 4.9% and investigations were deferred in 2.4%. Treatment modification or discontinuation occurred in only 0.6%. Transfusion services remained uninterrupted. Telemedicine was accessed by just 2.9% of patients. Eight patients (1.5%) tested positive for COVID-19, and the overall mortality was 3.9%, largely unrelated to COVID.

Conclusion: While core hematology services such as chemotherapy and transfusion were largely maintained, logistical and access-related disruptions were common during the COVID-19 pandemic. The findings underscore the importance of strengthening decentralized care models, formalizing transition systems, and expanding telemedicine in hematology to ensure continuity of care during public health crises.

Keywords: COVID-19, Hematology, Access to care, Health service disruption, India, Benign hematological disorders, Hematolymphoid malignancies, Telemedicine, Continuity of care, Pandemic impact

*See End Note for complete author details

INTRODUCTION

The COVID-19 pandemic posed an unprecedented challenge to healthcare systems globally.[1] In India, the declaration of a nationwide lockdown in March 2020 triggered an urgent and large-scale mobilization of healthcare infrastructure and manpower.[2] Hospitals across the country were rapidly reorganized to allocate resources toward managing the anticipated surge in COVID-19 cases, with a primary focus on emergency preparedness and pandemic containment efforts.[3] As the number of infections continued to rise, healthcare systems became increasingly concentrated on COVID-specific care, raising serious concerns about the neglect of routine and non-COVID medical services.[4] While significant attention and resources were allocated to managing the surge in COVID-19 cases, routine care for non-COVID patients, including those with chronic and complex conditions such as hematological diseases, faced substantial compromise.[5,6] This was especial-

Cite this article as: Jose MR, Esthapan A, Sara A, Hannah B, Mathew RJ, David A, et al. Challenges in Delivering Care for Hematolymphoid Disorders during the COVID-19 Pandemic : Insights from a Tertiary Center in Kerala, India. Kerala Medical Journal. 2025 Mar 28;18(1):9–14. | DOI: https://doi.org/10.52314/kmj.2025.v18i1.688

Corresponding Author:
Dr. Chepsy Philip MD,DM, Regional Advanced Centre for Transplant, Haemato-lymphoid Oncology & Marrow Diseases, Believers Church Medical College Hospital, Thiruvalla, Kerala, India-689103 Mobile: +918054004450
E-mail: chepsyphilip@bcmch.edu.in

ly concerning in low- and middle-income countries (LMICs) where health infrastructure and manpower are already constrained.[7-9]

This shift in focus disproportionately affected patients with chronic and complex conditions who rely on uninterrupted access to care. In particular, individuals with hematological diseases—both benign and malignant—require sustained, often intensive, treatment involving transfusions, chemotherapy, and frequent monitoring. Inability to travel, financial strain, and the breakdown of support systems during lockdown further limited access to critical care.[10,11] While international guidelines during the pandemic recommended deferral of elective procedures, postponement of transplants, reduced immunosuppression, and the use of telemedicine in place of in-person consultations[12-15] these strategies—largely designed in high-income contexts—may not be directly applicable in low- and middle-income countries (LMICs) like India, where delayed treatment may lead to rapid disease progression and worse outcomes.

Despite these risks, there remains a striking lack of data on how the pandemic impacted patients with hematological disorders in India. Patients with hematologic diseases—both benign and malignant—require continuous, often intensive care including transfusions, chemotherapy, and close monitoring.[16] Delays or disruptions can result in significant morbidity and even mortality.[17] In India, the implications of such disruptions during the pandemic remain poorly quantified.[18] Estimating the true burden of care disruption has important implications not only for patient outcomes but also for health system resilience and preparedness in the face of future emergencies.

In light of this, we conducted a cross-sectional study to evaluate the challenges and care disruptions experienced by patients with hematological diseases during the COVID-19 pandemic. The study was carried out at the Regional Advanced Centre for Transplantation, Haemato-Lymphoid Oncology and Marrow Diseases (RACTHAM), located at Believers Church Medical College Hospital (BCMCH)—a specialized hematology center serving central Kerala.

METHODS

Study Design and Setting

This was a cross-sectional study conducted at the Believers Church Medical College Hospital, Kerala. Our center caters to patients across multiple districts and serves as the pioneer dedicated hematology service in central Kerala.[19]

Study Population

All patients who were under the care of the Regional Advanced Centre for Transplantation, Haemato-Lymphoid Oncology and Marrow Diseases between April 1st 2020 through December 31st 2020 were included. Patients were contacted via phone or interviewed during OPD visits. No sampling was done; the entire accessible population was included.

Data Collection

A structured questionnaire collected data on sociodemographic details, diagnosis, and access to care, treatment deviations, and outcomes. Both retrospective and prospective data collection was used.

Data Management and Quality Control

All responses were recorded in a digital database by trained study personnel. Data entry was monitored daily for accuracy and completeness. Missing or inconsistent responses were verified through follow-up calls when feasible. Data were anonymised using unique hospital identifiers before analysis.

Data Analysis

Descriptive statistics were computed to summarize patient characteristics and types of care disruptions. Categorical variables were presented as frequencies and percentages. Continuous variables such as age and distance to hospital were expressed as means with standard deviation (SD) or medians with interquartile ranges (IQR), depending on distribution. All statistical analyses were conducted using Microsoft Excel and SPSS version 25.0.

Ethical Considerations

The study protocol was approved by the Institutional Ethics Committee of Believers Church Medical College Hospital. Informed consent was obtained from all participants or their legal guardians prior to inclusion in the study. Data confidentiality and privacy were strictly maintained throughout the study. Participation was voluntary.

RESULTS

Patient Characteristics

A total of 505 patients were included in the study **(Table 1)**. The mean age was 47.95 years (SD: 20.5), with the youngest being a neonate and the oldest aged 90 years. Among these, 256 patients (50.6%) were male and 249 (49.3%) were female. The majority of patients (n = 300, 59.4%) provided the information themselves,

Table 1. Baseline Characteristics and COVID-19 Related Disruption

Characteristic	Value
Total patients interviewed	505
Mean age (SD)	47.95 (±20.5)
Gender - Male	256 (50.6%)
Benign hematology	375
Malignant hematology	126
Care affected by COVID	68 (13.5%)
Care transferred during COVID	156 (30.8%)
Shift in treatment centre	158 (31.3%)
Unable to travel	27 (5.3%)
Change in treatment plan	3 (0.6%)
Treatment discontinuation	2
Follow-up visits affected	25
Investigations deferred	12
Transfusions deferred	0
COVID positive	8 (1.5%)
Telemedicine services used	15 (2.9%)
Deaths recorded	20 (3.9%)

Table 2. Comparison of Outcomes in Affected vs Non-Affected Groups

Outcome	Care Affected (n=68)	Care Not Affected (n=434)
Deaths recorded	5 (7.4%)	15 (3.5%)
COVID positive	2 (2.9%)	6 (1.4%)
Telemedicine used	3 (4.4%)	12 (2.8%)
Follow-up affected	18 (26.5%)	7 (1.6%)
Treatment modified	3 (4.4%)	0 (0%)

while the rest were assisted by family members or caregivers. Most patients were from Pathanamthitta (n = 258, 51.1%), followed by Alleppey (n = 123, 24.3%) and Kottayam (n = 62, 12.3%). The median distance to the hospital was 33 km (range: 1–2548.8 km).

Disease Profile

Of the 505 patients, 375 (74.3%) had benign hematological conditions, while 126 (25.7%) had malignant hematological disorders **(Figure 2)**. The most common benign diagnoses included iron deficiency anemia, thrombocytopenia, and abnormal blood counts, while the common malignant conditions were acute leukaemia, lymphomas, chronic myeloid leukaemia, and multiple myeloma.

Healthcare Access and Disruptions during COVID-19

A total of 68 patients (13.5%) reported that their care was directly affected by the COVID-19 pandemic

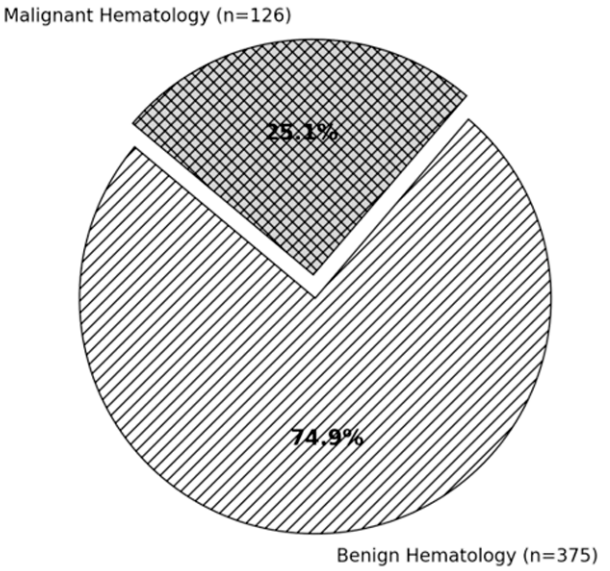

Figure 1. **Pie Chart – Distribution of Benign vs Malignant Cases. It shows the proportion of patients with benign and malignant hematological conditions in the study cohort.**

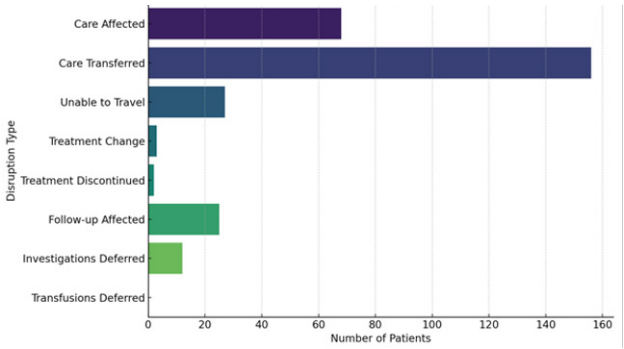

Figure 2. **Types of Care Disruptions during COVID-19. It illustrates the different categories of care disruptions experienced by patients during the COVID-19 pandemic.**

(Table 2). These disruptions were more frequently observed among patients requiring regular follow-up or transfusion support. Notably, while follow-up delays were common, transfusion services remained largely uninterrupted. Care transfer occurred in 156 patients (30.8%), indicating that nearly one-third of the cohort had to seek alternate treatment facilities due to either institutional repurposing for COVID care or limitations in accessing their regular centers. Similarly, 158 patients (31.3%) reported a complete shift in their primary treatment center, reflecting significant reorganization of care pathways during the pandemic.

In addition, 27 patients (5.3%) were unable to travel to their usual care centers due to lockdown restrictions, lack of transport, or fear of COVID exposure. Follow-up visits were missed or deferred in 25 patients (4.9%), and planned investigations were postponed in 12 patients (2.4%) **(Figure 2)**. Despite these chal-

lenges, transfusions were not reported as delayed in any patient, suggesting that blood and supportive care services were maintained effectively during this period.

Treatment Modifications

Despite the pandemic-induced strain on healthcare delivery, treatment modifications were minimal in this cohort. Only 3 patients (0.6%) had documented changes to their treatment regimen, and 2 patients discontinued treatment altogether—either due to logistical barriers or personal choice. Importantly, there were no reported deferrals in planned chemotherapy or transplant procedures, reflecting the institution's commitment to maintaining continuity of critical hematologic treatments during the crisis.

COVID-19 Infection and Related Outcomes

Among the 505 patients studied, only 8 (1.5%) tested positive for COVID-19 of whom 2 required mechanical ventilation. A total of 20 patients (3.9%) died during the study period, although in the majority of cases, the cause of death was unrelated to COVID-19. These findings highlight a relatively low direct burden of COVID infection in this population but underscore the broader indirect impacts of the pandemic on care delivery and outcomes.

Use of Telemedicine and Support Systems

Telemedicine services were used by 15 patients (2.9%) accessing virtual consultations through institutional availability. Socioeconomic impact was also evident, with 30 patients reporting loss of income during the pandemic—an issue that could have influenced healthcare-seeking behavior and treatment adherence. Communication with patients remained feasible, with a median of one attempt (IQR: 1–2) needed to establish contact, demonstrating reasonable accessibility even during lockdown.

A majority of patients (317; 62.7%) reported self-referral or continuity from previous care at BCMCH. The remaining patients were referred by physicians, other hospitals, or accessed the center due to proximity during travel restrictions.

Previous Healthcare Contact and Transition

The median number of centers visited by patients prior to presenting at BCMCH was one, with a range from 0 to 8. Notably, 113 patients (22.4%) accessed BCMCH directly without prior consultation at other facilities, possibly reflecting the center's emerging role as a referral hub for hematologic care in the region during the pandemic.

DISCUSSION

The COVID-19 pandemic created unprecedented disruptions across all domains of healthcare delivery, disproportionately affecting patients with chronic and immunocompromised conditions.[20-22] This cross-sectional study, involving 505 patients under hematology care at a regional tertiary center in Kerala, offers unique insight into how the pandemic impacted individuals with haemato-lymphoid diseases in a resource-limited setting.

Our findings indicate that approximately 1 in 7 patients (13.5%) experienced some form of disruption in care during the pandemic. Although this proportion may appear modest, it is clinically significant, considering the high dependency of hematological patients on regular monitoring, chemotherapy, transfusion support, and follow-up. This burden was even more pronounced among patients requiring multidisciplinary care or support services—many of which were either repurposed for COVID management or became inaccessible due to lockdowns and logistical hurdles.[23]

Interestingly, care transfer (30.8%) and shift in treatment centers (31.3%) were noted at rates more than double the number reporting direct care disruptions. This reflects an adaptive coping strategy by patients, possibly driven by geographical constraints, local travel policies, or reduced functionality of their primary centers.[18] Such transitions, while necessary, may compromise continuity of care and clinical outcomes, especially in patients on disease-modifying therapy.

Despite concerns around chemotherapy deferral and immune suppression, very few patients in our cohort experienced treatment alteration (0.6%) or treatment discontinuation (0.4%). Notably, no transfusions were reported as missed—suggesting that core supportive services were maintained, perhaps aided by early institutional planning and prioritization of hematological care. These observations diverge from several international recommendations, which leaned toward therapy deferrals, especially in low-grade lymphomas or myelodysplastic syndromes.[13-15, 24-26] In our context, treatment continuation likely reflected the belief that progression of disease may pose a more imminent threat than COVID itself, especially in a setting with limited salvage options.[16]

The low incidence of confirmed COVID-19 infection (1.5%) among the study cohort, and the low rate of telemedicine use (2.9%), raises few considerations. The first may reflect genuine low exposure, heightened personal protection measures, or under-testing due to access barriers. The second possibly highlights the limited digital integration in hematology care in India—a gap that needs urgent attention as telehealth becomes more embedded in post-pandemic healthcare models.[27-29] It can also be argued that our patients with hematological diseases preferred a direct physician visit over telemedicine to continue their care.

Another key finding was the number of patients (31.3%) reporting a shift in treatment center, emphasizing the fragility of referral systems and the value of decentralizing hematology services. In the absence of a formal transition protocol, such shifts may result in duplication of tests, therapeutic delays, and missed opportunities for disease monitoring. Additionally, economic fallout, with reported income loss in at least 30 families, underlines the multidimensional toll of the pandemic, where financial insecurity directly intersects with healthcare access.

The fact that only 15 patients accessed telemedicine suggests a strong need to expand and standardize virtual hematology care. While remote consultation is not a replacement for in-person evaluations in many hematologic scenarios, it can serve as a crucial tool for triage, follow-up, counseling, and medication adjustments—especially during emergencies.

STRENGTHS AND LIMITATIONS

Our study highlight's the pandemic's impact on hematological care from a patient-centred perspective. The comprehensive data collection, inclusion of a diverse spectrum of hematological diseases, and focus on real-world disruptions and adaptations are notable strengths.

However, we acknowledge its limitations .We present data from a single center, and though BCMCH is a referral center, findings may not be generalizable to all parts of Kerala or India.

Recall bias could affect accuracy, especially for retrospective questions about care disruptions. Additionally, causality cannot be inferred due to the cross-sectional design, and certain outcomes such as disease progression or survival differences were not evaluated.

Implications for Policy and Practice

The study highlights key areas for strengthening hematology care during future health emergencies. There is a pressing need for resilient healthcare systems that can sustain non-COVID services like transfusions and chemotherapy during crises. Decentralizing hematology services by establishing regional hubs can reduce dependence on single centers and improve access. The findings also call for structured referral and transition protocols to support continuity of care when patients are displaced. The limited use of virtual care emphasizes the need for integrating telemedicine into routine hematology practice. Finally, financial and logistical support systems must be developed to protect vulnerable families from care disruptions during public health emergencies.

CONCLUSION

The COVID-19 pandemic disrupted the care of patients with hematological diseases in complex ways—forcing treatment shifts, care transfers, and missed follow-ups—though treatment abandonment remained low. This experience offers a compelling case for system-wide preparedness strategies to ensure that future health emergencies do not undermine ongoing care for vulnerable, high-need tpopulations like those with haemato-lymphoid disorders.

END NOTE

Author Information

1. Dr. Manju Rosy Jose, Clinical Pharmacist, Believers Church Medical College Hospital, Thiruvalla, Kerala, India
2. Dr. Anju Esthapan, Clinical Pharmacist, Believers Church Medical College Hospital, Thiruvalla, Kerala, India
3. Dr. Anu Sara, Clinical Pharmacist, Believers Church Medical College Hospital, Thiruvalla, Kerala, India
4. Dr. Brisha Hannah, Clinical Pharmacist, Believers Church Medical College Hospital, Thiruvalla, Kerala, India
5. Dr. Rohan J Mathew, Clinical Pharmacist, Believers Church Medical College Hospital, Thiruvalla, Kerala, India

6. Dr. Alice David, Head of Research & Biostatistics, Believers Church Medical College Hospital, Thiruvalla, Kerala, India

7. Dr. Chepsy Philip, MD, DM, Professor & Head, Regional Advanced Centre for Transplant, Haemato-lymphoid Oncology & Marrow Diseases, Believers Church Medical College Hospital, Thiruvalla, Kerala, India

Conflict of Interest: None declared

REFERENCES

1. Philip CC, Devasia AJ. Treating hematolymphoid malignancies during COVID-19 in India: Challenges and potential approaches. Cancer Res Stat Treat. 2020 Apr;3(Suppl 1):S59.
2. PM Modi announces 21-day lockdown as COVID-19 toll touches 12. The Hindu [Internet]. [cited 2025 Apr 21].
3. Challenges faced by the Private Healthcare sector due to COVID-19. BW Healthcare World [Internet]. [cited 2025 Apr 21].
4. Rosenbaum L. The Untold Toll — The Pandemic's Effects on Patients without Covid-19. N Engl J Med. 2020 Jun 11;382(24):2368–71.
5. Jain A, Nayak L, Kulkarni UP, Mehra N, Yanamandra U, Kayal S, et al. Covid-19 Infection in Hematological Malignancies: Registry Data from India. Blood. 2021 Nov 5;138(Suppl 1):1938.
6. Wu TY, Tsai WT, Chen KH, Huang ST, Huang CF, Kuo PH, et al. Clinical manifestations and risk factors for COVID-19 and its severity in patients with hematological malignancies. J Microbiol Immunol Infect. 2024 Jun 1;57(3):403–13.
7. Jain A, Singh C, Dhawan R, Jindal N, Mohindra R, Lad D, et al. How to Use a Prioritised Approach for Treating Hematological Disorders During the COVID-19 Pandemic in India? Indian J Hematol Blood Transfus. 2020 Oct 1;36(4):605–15.
8. Philip CC, Selvarajan S, Nayak L, Jain H, Kulkarni UP, Samuel P, et al. Acute Myeloid Leukemia during the COVID Pandemic: Impact and the Indian Experience. Blood. 2022 Nov 15;140:8127–8.
9. Pramesh CS, Badwe RA. Cancer Management in India during Covid-19. N Engl J Med. 2020 May 14;382(20):e61.
10. COVID-19 continues to disrupt essential health services in 90% of countries. World Health Organization [Internet]. [cited 2025 Apr 21].
11. How Covid war is hurting India's non-Covid patients. Times of India [Internet]. [cited 2025 Apr 21].
12. COVID-19 Resources. American Society of Hematology [Internet]. [cited 2025 Apr 21].
13. Burki TK. Cancer guidelines during the COVID-19 pandemic. Lancet Oncol. 2020 May 1;21(5):629–30.
14. Grever M, Andritsos L, Banerji V, Barrientos JC, Bhat S, Blachly JS, et al. Hairy cell leukemia and COVID-19 adaptation of treatment guidelines. Leukemia. 2021 Jul;35(7):1864–72.
15. Brissot E, Labopin M, Baron F, Bazarbachi A, Bug G, Ciceri F, et al. Management of patients with acute leukemia during the COVID-19 outbreak: practical guidelines from the acute leukemia working party of the European Society for Blood and Marrow Transplantation. Bone Marrow Transplant. 2021 Mar;56(3):532–5.
16. Bhat S, Bonda A, Sengar M, Thorat J, Bagal B, Nayak L, et al. CANCER Care in COVID-19 ERA: A Prospective Survey to Study the Preferences and Perspectives of Patients with Hematological Malignancies in a Tertiary Cancer Care Setting in India. Indian J Hematol Blood Transfus. 2024 Oct 1;40(4):725–7
17. Aggarwal M, Amjad MS, Khandelwal A, Kumar P, Dhawan R, Dass J, et al. COVID-19 infection in patients with haematological disease - A tertiary centre experience from north India. Indian J Med Res. 2022;155(5–6):570–4.
18. Philip C, Selvarajan S, Nayak L, Jain H, Kulkarni U, Samuel P, et al. Impact of the COVID-19 pandemic on treatment of patients with acute myeloid leukaemia in India. Br J Haematol. 2024 Sep 16.
19. Philip C, Abraham B, George B, Jacob A, Raju N, Abraham S, et al. Pioneering clinical hematology and bone marrow transplant services in Central Travancore, Kerala: a transformative journey. Believers Med J. 2023 Dec;6(1):20–7.
20. Gavillet M, Carr Klappert J, Spertini O, Blum S. Acute leukemia in the time of COVID-19. Leuk Res. 2020 May;92:106353.
21. Kakavandi S, Hajikhani B, Azizi P, Aziziyan F, Nabi-Afjadi M, Farani MR, et al. COVID-19 in patients with anemia and haematological malignancies: risk factors, clinical guidelines, and emerging therapeutic approaches. Cell Commun Signal. 2024 Feb 15;22(1):126.
22. Wang LQ, Tan SYE, Wei GQ, Hu YX, Nagler A, Huang H. Weathering the storm: COVID-19 infection in patients with hematological malignancies. J Zhejiang Univ Sci B. 2020 Dec 1;21(12):921–39.
23. Senapati J, Aggarwal M, Louis L, Mirza SA, Kumar P, Dhawan R, et al. Transfusion practices during the COVID-19 pandemic: An experience from a hematology daycare in India. Transfus Apher Sci. 2021 Apr;60(2):103025.
24. Sahu KK, Cerny J. A review on how to do hematology consults during COVID-19 pandemic. Blood Rev. 2021 May 1;47:100777.
25. Buske C, Dreyling M, Alvarez-Larrán A, Apperley J, Arcaini L, Besson C, et al. Managing hematological cancer patients during the COVID-19 pandemic: an ESMO-EHA Interdisciplinary Expert Consensus. ESMO Open. 2022 Apr 1;7(2):100403.
26. Cesaro S, Ljungman P, Mikulska M, Hirsch HH, von Lilienfeld-Toal M, Cordonnier C, et al. Recommendations for the management of COVID-19 in patients with haematological malignancies or haematopoietic cell transplantation, from the 2021 European Conference on Infections in Leukaemia (ECIL 9). Leukemia. 2022 Jun;36(6):1467–80.
27. Dash S, Aarthy R, Mohan V. Telemedicine during COVID-19 in India—a new policy and its challenges. J Public Health Policy. 2021 Sep;42(3):501–9.
28. Mahajan V, Singh T, Azad C. Using Telemedicine During the COVID-19 Pandemic. Indian Pediatr. 2020 Jul 1;57(7):658–61.
29. Mishra V. Factors Affecting the Adoption of Telemedicine during COVID-19 in India. Indian J Public Health [Internet]. 2020 [cited 2025 Apr 21];64(6):234–6.