



Cuddles Foundation

Childhood Cancer in India

Analysing the impact of good
nutrition on children with cancer.



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Executive Summary



Approximately 50,000 children are diagnosed with cancer every year in India. Unfortunately, childhood cancer cannot be prevented or detected through regular screening, but generic medicine and therapy, including chemotherapy and radiation, can cure most childhood cancers. Yet, in low and middle-income countries, like India, an estimated 15-45% of children are cured of cancer as compared to more than 80% in high income countries. The critical reasons for the vast difference are many, including delayed diagnosis and inaccessibility to holistic and supportive care.¹

There is yet another hurdle for children with cancer in India. Unfortunately, ~40% of them are malnourished at the time of cancer diagnosis, putting them at a greater risk of infection, side effects, complications and treatment delays.

At Cuddles Foundation, our FoodHeals® program bridges the nutrition gap in children with cancer in 35 hospitals across India. In the last financial year 2020-2021, during the Covid-19 pandemic, Cuddles Foundation provided nutrition

counselling to more than 6,000 patients. Thanks largely to our FoodHeals® App, we could assess the impact of nutrition on these patients. Despite cancer therapy like chemotherapy and radiation, 80% of patients improved or maintained their nutritional status.² Also, 94% of patients we counselled returned for a second visit or continued treatment.² We have noticed in our experience on-ground that well-nourished patients tolerate treatment better, experience primarily minor side effects, have fewer treatment delays, and have a faster recovery time.

This report highlights the crucial role nutrition plays in getting children fighting cancer closer to a cure. Hopefully, we can bring people together to support more government hospitals to have dedicated paediatric nutritionists and food aid as part of their treatment protocol. Perhaps, mandatory nutritional counselling for all childhood cancer patients is something clinicians can ask for and implement. Finally, we hope this report encourages researchers to further study the impact of nutrition on childhood cancer so that children have a better chance at a cure.

Purnota Dutta Bahl

Founder & CEO

Cuddles Foundation

Alone we can do only so much. Together, anything is possible.

Childhood Cancer: National Scenario

- ▶ In India, survival is a challenge as many children with cancer are malnourished at diagnosis. Childhood cancer is curable if a child is physically strong to take treatment.

50,000

children and adolescents ages 0 to 19 years will be diagnosed with cancer each year.
(Source: Indian Cancer Society)



80%

children abandon treatment in lower to middle income countries (LMICs) due to financial constraints, alternative medicine or the false belief that cancer is incurable.^{3,4}



~40%

children with cancer are malnourished at diagnosis.⁵



~30%-40%

5-year net survival rate for childhood cancers in India.⁶



~70%

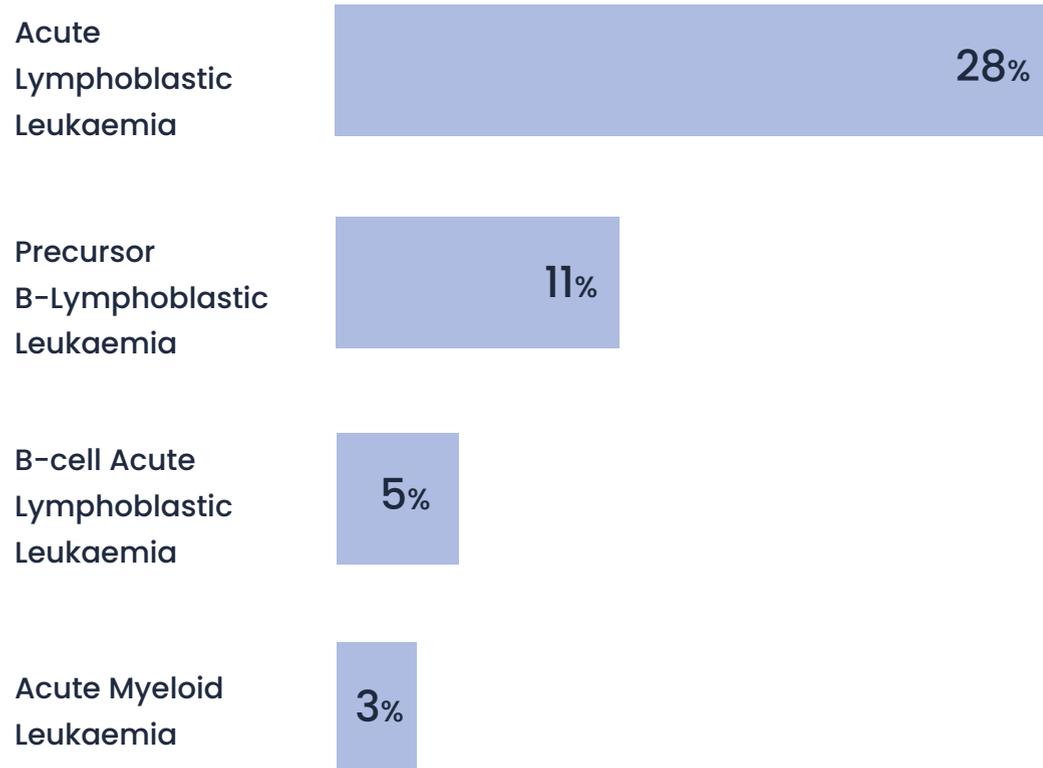
survival rate when treatment is multidisciplinary including nutrition.⁷

In the year 2020–21, we engaged with 6,000+ children across our 30+ partner hospitals. Here's what we found:²

6,000+

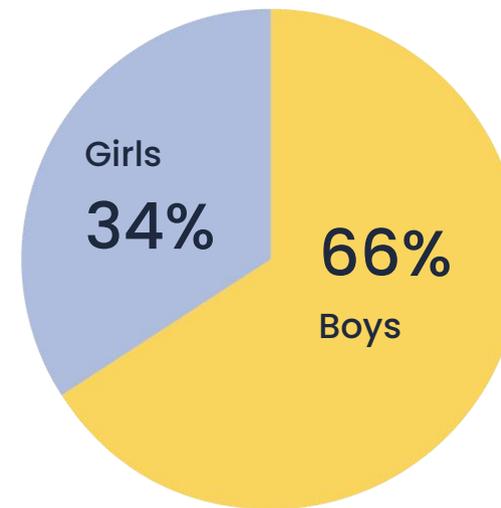
Patients engaged

Top 4 Prevalent Cancers



1,00,000+

Counselling sessions conducted



► Gender Ratio at diagnosis

The trend we see in our work seems to resonate with the ratio of cancer diagnosis amongst boys and girls in India which is 1.58.⁸ This means that for approximately every 5 boys diagnosed with cancer only 3 girls are diagnosed. This gender imbalance is largely seen in poorer countries where girls are less likely than boys to be referred to a doctor when they fall ill.

Why Nutrition Matters

Unfortunately, ~40% of Indian children with cancer are malnourished at the time of diagnosis.⁵ Cancer therapy further impacts a child's nutritional status.

The causes of malnutrition in children with cancers are multifactorial and dynamic in nature. Side-effects of treatment, complex metabolic disturbances, and changes in the inflammatory and hormonal system trigger alterations in the body. These effects are very often exacerbated by poor appetite, vomiting and nausea that hinder adequate food intake and further compromise the nutritional status. All of these factors result in a loss of adipose tissue and muscle mass resulting in malnutrition.⁹

► We address nutrition needs for childhood cancer because with the right nutrition and care, a child experiences:

- ✓ Reduced side-effects and treatment complications
- ✓ Fewer breaks or delays in treatment
- ✓ Improved chances for survival
- ✓ Better immunity against infection
- ✓ A feeling of being supported and cared for

80% caregivers do not know the proper foods to feed their child when they first receive the cancer diagnosis.^{*10}

34%

say they don't have or somewhat have the means to pay for the food, after they understood the nutrition support required.

96%

are happy to know that people beyond hospital staff also care for their children's outcomes.

88%

believe that support groups can be helpful.

59%

do not know the proper hygiene required to handle their child's food.

**Responses collected on a 3-point likert scale (Yes, Somewhat, No). Sample size was 754 caregivers across 30+ partner hospitals. Data collected through a survey in March 2021.*

► Impact on treatment follow-up

94% of children are more likely to stick with their treatment plan when nutrition is a part of it.*²

**New patients who returned for a second visit or continued treatment.*



Meet 10-year-old Nandu

Nandu* was diagnosed with high-risk AML and travelled 150 km away from home to Hyderabad to seek treatment. Nandu's father was a porter, and it was tough for him to manage her treatment and live in another city. He had a young daughter back home, who also needed to be cared for. Nandu's father felt he had no choice but to discontinue her treatment.

We immediately started her on the ration program when we found out about this and urged her father to continue her treatment. The ration bundle would help the entire family. With proper counselling, supplements and ration, Nandu responded well to the treatment and her nutritional status improved from mild thinness to well-nourished.

**Patient name & photograph has been included with their guardian's consent.*

► Impact on Nutritional Status

80% of patients improved or maintained their nutritional status, despite cancer therapy like chemotherapy or radiation.²

“



"What's been strikingly evident while treating children with cancer is that whenever we had a malnourished child (underweight or overweight) their response to the treatment would be suboptimal, side-effects to treatment would be very high and overall outcome for the disease would be really poor, compared to a child with appropriate weight. Such is the impact of malnutrition on cancer therapy!"

Dr Vasudeva Bhat

Paediatric Oncologist, Kasturba Medical College, Manipal, Karnataka.



Good food makes medicine work.

RTI International India, an independent, nonprofit research institute, used a mixed method approach to evaluate the impact of nutrition on children with cancer. The study covered 13 public cancer hospitals covered by Cuddles Foundation's program. Here's what they found:¹¹

Average BMI z-score	between first and last visits improved by 16%, indicating an overall improvement in health.
Average MUAC*	increased by 12%, demonstrating improvement in nutritional status of the patients.
Average body weight*	increased by nearly 8% from their first visit to last visit.
% of patients in the underweight category	reduced by 7% from the first visit (82%) to the last visit (75%).

**Statistically significant result*

- ▶ Increase in number of hospital visits and increase in calorie intake by visit led to a statistically significant increase in both body weight and BMI z-score. These results indicate that the intervention has a positive impact on the nutritional outcome of patients.



“Because of these active interventions, we've observed a remarkable positive effect on response and tolerability to chemotherapy and outcome”

Dr Munlima Hazarika
Professor at Dept. of Paediatric Oncology,
Dr B Borooah Cancer Institute, Guwahati, Assam.

Cuddles Foundation

Changing how childhood cancer is fought in India by bridging the gap between medicine and nutrition.

Since 2013, we have been working with government and charity cancer hospitals, enabling them with trained paediatric oncology nutritionists and food aid so that more children may win the battle against cancer. With the FoodHeals® App, a first-of-its-kind tech platform that automates clinical nutritional functions, we are able to create an ecosystem that enables medical and nutrition teams to collaborate more effectively and make specialised nutritional care more accessible to children. We also freely share our breakthroughs and experience with healthcare practitioners so that they may use this knowledge to save thousands of more children.

UN Sustainable Development Goals



Our Reach

12

States

35

Hospitals

44

Nutritionists



▶ Recipient of the National Award for Child Welfare, 2015-16.

The FoodHeals[®] Program

We customise the program to every child's medical condition to provide the right nutrition needed to complete treatment successfully. Here's how:

Support

We also support patient families with the knowledge to make healthier food choices by organising parent support group meetings, videos and educational talks.

Monitor

We continuously monitor the child's nutritional status and reassess plans, if required.

Assess

We first assess and screen the nutritional status of every child seeking cancer treatment in our partner hospitals.

Evaluate

We evaluate side effects that may negatively impact the child's nutritional status.

Prescribe

We finalise the right nutrition therapy and prescribe a customised diet plan for the child.

Provide

We aid and support the child and family by providing nutritional supplements, hot meals, in-meals, eggs, bananas and monthly ration bundles for a family of four.



Nutrition aid is as crucial as counselling.

Considering that a large majority of Cuddles' beneficiaries earn less than Rs. 10,000 per month, distribution of nutrition aid is essential.*¹²

▶ Aid distributed in the year 2020-21²

11.5k

Ration bundles distributed

4,400

Average kilocalories given per day with the ration program

₹3,200

Savings added to caregiver incomes per month

266k

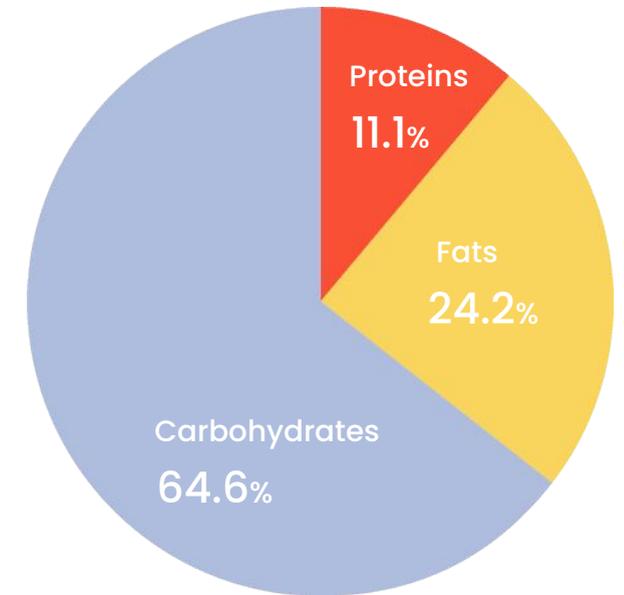
In-meals

14.4k

Hot meals

28.4k

Nutritional supplements



Nutritional composition of ration bundles disbursed

Our monthly ration bundles help feed a family of four. Each bundle contains cereals, pulses, millets, nuts and oilseeds, ghee, oil, spices, condiments and basic personal hygiene products.

At 4,400 kcal/day the ration bundle fulfills 100% of the total calorie requirement for the child per day and contributes to the nutritional requirements of the family members as well.

*Responses were collected from 1,015 beneficiaries at over 30+ partner hospitals in June 2021.

The Way Forward

A future full of possibilities starts with a meal full of goodness.

This report aims to spotlight the urgent need for good nutrition for children battling cancer in India. Several studies indicate that children face a lower risk of infections, fewer treatment delays, reduced side effects and recover more quickly with adequate nutrition.^{13,14} We have observed similar findings at Cuddles Foundation. With the help of our digitised data, we also found that with the support of nutrition counselling and nutrition aid, 80% of our patient's nutritional status improved or maintained despite cancer therapy.

Cuddles Foundation will continue its commitment to work around the clock to bridge the nutrition gap in children fighting cancer in hospitals across the country, giving them a better chance at survival. We hope that more people will join us in this mission to feed the fight, including government hospitals, clinicians, researchers, and citizens. Let us work together to give these children a chance at a cure.



Meet 5-year-old Swara

When 5-year-old Swara* was diagnosed with cancer, her family moved to a rented apartment in Pune from Baramati for her treatment. Her father had spent all of his savings on her medical tests and travel. When we met Swara, she weighed less than what she was supposed to at her age and consumed only 23% of her energy requirements. She also experienced side effects of chemotherapy, including loss of appetite.

Her family was then immediately enrolled in the monthly ration program and counselled about enriching her diet given her condition. Her father was relieved that he did not have to worry about feeding his family - the lockdown had just begun, and getting resources was difficult. After a year of regular counselling and nutrition support, Swara has entered the maintenance phase of treatment and is back home in Baramati.

**Patient name & photograph has been included with their guardian's consent.*

Research Methodology:

What We Measured

Cases

Patients engaged at the partner hospital(s) are noted on a rolling basis, and the gathered data is analysed for the annual time period.

- # of patients engaged
- # of counselling sessions
- # of cases by ratios (male/female)*
- # of cases by types of prevalent cancers*

Rate of Follow-up

This includes the percentage of new patients who return for a second visit and/or continue treatment. This determinant is a reversal of the failure to start treatment, which is a subset of the standard measure of treatment abandonment.

- % of new patients who did follow-up*

Nutrition Aid

We assess the nutritional support provided in two ways: in terms of value i.e., average kilocalories given per day; and average price of aid as savings to caregiver income; and in terms of physical quantities i.e., ration bundles, in-meals, nutritional supplements and hot meals disbursed and nutritional composition of the ration bundle.

- Average kilocalories per day
- Average savings added to caregiver incomes
- # of nutritional supplements distributed
- # of hot meals distributed
- # of in-meals distributed
- # of ration bundles distributed
- Nutritional composition per ration bundle

- ▶ In consultation with cancer and nutrition specialists and multidisciplinary experts, the following metrics were determined as appropriate to help us demonstrate the effectiveness and impact of the FoodHeals® program:

Impact on Nutritional Status

At every visit, nutritionists note patient MUAC or Body Mass Index (BMI), which is required to determine the patient's nutritional status. Impact on nutritional status covers change in patient's nutritional status from their first to last visit.

- % increased or no change*

Case Stories

This notes the qualitative impact of the FoodHeals® program. Case stories highlight patients who have been engaged as part of the FoodHeals® program, adhered to their treatment schedule and have benefited from the program.

*For these analyses, we've only included data from partner hospitals who've shared a minimum of six months of program data with us either via the app or registry. Please refer to the next page for the list of hospitals.

Thank you!

Our heartfelt gratitude to all those who've been a part of our journey since 2013 to make this report a reality.

Thank you to our doctors, nurses and the support staff we work with at all our partner hospitals across India. Above all, to the entire team at Cuddles Foundation including our nutritionists, back office team, consultants and volunteers for working tirelessly to serve our patients and their families.

And finally, our donors for believing in us and supporting our mission to give every child fighting cancer a chance at a cure.

Hospitals part of the research

1. Nil Ratan Sircar Medical College and Hospital (NRSMC), Kolkata
2. Saroj Gupta Cancer Centre & Research Institute, Kolkata
3. Dr. B Borooah Cancer Institute (BBCI), Guwahati
4. Assam Medical College & Hospital (AMC), Dibrugarh
5. All India Institute of Medical Sciences (AIIMS) A, Delhi
6. All India Institute of Medical Sciences (AIIMS) B, Delhi
7. Sanjay Gandhi Postgraduate Institute of Medical Sciences (SGPGI), Lucknow
8. Bhagwan Mahaveer Cancer Hospital & Research Centre (BMCHRC), Jaipur
9. Sher-I-Kashmir Institute of Medical Sciences (SKIMS), Srinagar
10. Homi Bhabha Cancer Hospital (HBCH), Varanasi
11. St John's Medical College Hospital, Bengaluru
12. Mazumdar Shaw Cancer Centre (MSCC), Bengaluru
13. Sri Shankara Cancer Hospital and Research Centre, Bengaluru
14. Mehdi Nawaz Jung Institute of Oncology & Regional Cancer Centre (MNJ), Hyderabad
15. Meenakshi Mission Hospital & Research Centre (MMRCH), Hyderabad
16. Malabar Cancer Centre (MCC), Thalassery
17. Kasturba Medical College & Hospital (KMCH), Manipal
18. KLES Dr Prabhakar Kore Hospital & Medical Research Centre, Belgaum
19. Bai Jerbai Wadia Hospital for Children, Mumbai
20. Lokmanya Tilak Municipal General Hospital, Mumbai
21. Topiwala National Medical College & B.Y.L. Nair Charitable Hospital, Mumbai
22. King Edward Memorial Hospital (KEM), Mumbai
23. Deenanath Mangeshkar Hospital and Research Center, Pune
24. Bharati Vidyapeeth Hospital, Pune
25. KEM Hospital, Pune
26. Regional Cancer Centre (RCC), Raipur

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Published in August 2021.

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Feed a child. Starve cancer.

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