

Short Communication

Clinical insights on nutrition support in pediatric cancer care: a survey of pediatric oncologists

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ABSTRACT

Cuddles Foundation, an NGO in India providing comprehensive nutrition care to children with cancer, conducted a nationwide survey among pediatric oncology professionals to understand the perceived impact of nutrition intervention programs on clinical outcomes, treatment tolerance, and caregiver empowerment for pediatric oncology patients. Responses from 48 pediatric oncology doctors, including residents, consultants, and department heads, revealed overwhelmingly positive perceptions of nutrition in improving patient outcomes.

Keywords: Pediatric oncology, Nutrition, Supportive care

INTRODUCTION

Malnutrition in patients remains a significant barrier to effective treatment in pediatric cancer care. Poor nutritional status has been associated with increased treatment toxicity, delayed recovery, and lower survival rates.^{1,10-12} These risks are further compounded in low and middle-income countries (LMICs), where food insecurity and limited access to specialized nutrition care can exacerbate the challenges faced by children with cancer.² A recent study found significant associations of high undernutrition rates with worse survival, prompting the authors to advocate for pediatric cancer to be classified as a “high-risk” condition in nutrition policy and guidelines for LMICs.³

Despite the clear impact of malnutrition on outcomes, nutrition frequently remains under prioritized compared to other aspects of cancer therapy, compromising the care and prognosis of affected children.

Established in 2013, Cuddles Foundation is a non-profit organization dedicated to addressing this gap by integrating nutrition as a core component of pediatric oncology care currently across 46 government and charitable hospitals in India.

Guided by the vision that no child should fight cancer on an empty stomach, Cuddles Foundation provides tailored nutrition interventions that include comprehensive nutritional assessments, individualized meal planning, provision of high-quality nutrition aid such as supplements and ration and ongoing caregiver and medical staff education. These interventions are designed to support patients throughout their treatment journey and improve clinical outcomes.

To evaluate the perceived impact of this support, Cuddles Foundation conducted a structured survey with pediatric oncologists across India, capturing their insights on how nutrition interventions influence various aspects of nutritional care.

METHODS

A cross-sectional survey was conducted in December 2024 with pediatric oncologists affiliated with hospitals that partner with Cuddles Foundation. Eligible participants included pediatric oncologists affiliated with hospitals partnering with Cuddles Foundation who were directly involved in the clinical care of children with cancer. No formal exclusion criteria were applied. Responses were obtained from all clinicians approached. The survey instrument was developed by Cuddles Foundation with the primary objective of capturing pediatric oncologists'

perception of program impact. An overview of the survey is provided in Figure 1.

It consisted of multiple-choice and open-ended questions assessing the perceived impact of nutrition interventions on patient health, treatment tolerance, complications, and caregiver engagement. Demographic data including professional roles and years of experience were also collected. As the survey was conducted among healthcare professionals and did not involve patient data, patient contact, or collection of identifiable health information, ethical approval was not sought.

Instructions: Complete this short survey about nutrition support intervention.

Hospital / Institution: _____
Department: _____
Date: ____/____/____
Clinician name (optional): _____

Section 1: Background Information

Your role:
☐ Head of Department
☐ Resident
☐ Consultant
☐ Other: _____

Years of experience in pediatric oncology:
☐ Less than 1 year
☐ 1–3 years
☐ 4–6 years
☐ 7+ years

Have you worked directly with patients participating in the nutrition intervention?
☐ Yes
☐ No

Section 2: Clinical Outcomes

1. How would you rate the impact of the nutrition intervention on patients' overall health? :
☐ Significant improvement ☐ Minimal improvement
☐ Moderate improvement ☐ No improvement

2. Have you observed a difference in the ability of patients to tolerate cancer treatments (chemotherapy/radiation) since starting the nutrition program?
☐ Yes — significantly better ☐ Yes — somewhat better
☐ No difference ☐ Tolerance worsened

3. Do you feel the nutrition intervention has reduced complications related to treatment (E.g., infections, delayed recovery)?
☐ Yes
☐ Somewhat
☐ No

Section 3: Program Improvement

Have you noticed an improvement in caregivers' ability to manage their child's nutritional needs as a result of the program?
☐ Yes
☐ Somewhat
☐ No

Section 4: Additional Information

What aspect of the nutrition intervention has been most beneficial to patients, in your opinion?

Any other comments/insights:

Figure 1: Structure and content of the survey used to assess pediatric oncologists' perceptions of nutrition support interventions.

RESULTS

The survey included responses from 48 pediatric oncology doctors representing hospitals across India. Participant characteristics are summarized in Table 1. Nearly half of the respondents were consultants (45.8%), followed by heads of pediatric oncology departments (29.2%) and residents (18.8%). Half of the participants reported more than seven years of professional experience, and responses were obtained from all four geographic regions of the

country, with the highest representation from South India (31.3%) and West India (29.2%).

Pediatric oncologists' perceptions regarding the impact of nutrition support interventions across clinical and caregiver-related outcomes are summarized in Table 2. When asked about the overall impact of nutrition interventions, 94% of doctors reported significant improvement in patients' health, while 6% observed moderate gains. Regarding treatment tolerance, 77%

observed much better tolerance to chemotherapy and radiation, and 23% noted some improvement.

Doctors were also asked about treatment-related complications, such as infections and delays in recovery. Eighty-three percent of the respondents indicated that these complications had notably decreased in patients receiving nutrition interventions, whereas 17% perceived a moderate reduction.

The effect of nutrition support on caregiver empowerment was similarly positive. Eighty-five percent of doctors agreed that caregivers were noticeably better equipped to manage their child's nutrition, while 15% felt there was some improvement in this area.

Pediatric oncologists also provided qualitative feedback and highlighted nutritional counselling, especially at diagnosis, as the most impactful aspect of the intervention, improving patient and caregiver understanding ("nutritional counselling has played a pivotal role at the outset of diagnosis, and has been the most beneficial for the patients"). Guidance on nasogastric feeds, reinforcement of feeding practices, and one-on-one

discussions built caregiver confidence and adherence. Regular involvement of trained nutritionists during rounds and follow-ups further strengthened care delivery.

Table 1: Demographic characteristics of participating pediatric oncology doctors (n=48).

Characteristic	N (%)
Professional role	
Consultant	22 (45.8)
Head of department	14 (29.2)
Resident	9 (18.8)
Others	3 (6.2)
Years of professional experience	
<1	2 (4.2)
1–6	22 (45.8)
>7	24 (50.0)
Geographical region	
North India	10 (20.8)
West India	14 (29.2)
East India	9 (18.8)
South India	15 (31.3)

Table 2: Clinician-reported perceptions of the impact of nutrition support interventions on patient and caregiver outcomes in pediatric oncology (n=48).

Outcome	Response category	N (%)	95% CI
Overall patient health	Significant improvement	45 (93.8)	82.8–98.7
	Moderate improvement	3 (6.2)	2.2–16.4
	Minimal improvement	0 (0.0)	0.0–7.4
	No improvement	0 (0.0)	0.0–7.4
Tolerance to chemotherapy and radiation	Significantly better	37 (77.1)	63.2–86.9
	Somewhat better	11 (22.9)	13.1–36.8
	No difference	0 (0.0)	0.0–7.4
	Worse	0 (0.0)	0.0–7.4
Treatment-related complications	Yes (reduced)	40 (83.3)	70.4–91.3
	Somewhat	8 (16.7)	8.7–29.6
	No	0 (0.0)	0.0–7.4
Caregiver ability to manage nutritional needs	Yes (improved)	41 (85.4)	72.8–92.8
	Somewhat	7 (14.6)	7.2–27.2
	No	0 (0.0)	0.0–7.4

Confidence intervals were calculated using the Wilson binomial method

Respondents also emphasized the provision of enteral and parenteral nutrition, particularly for severely malnourished patients or those unable to consume food orally due to treatment related side effects like mucositis. Early initiation of enteral feeding and access to TPN bags, often unaffordable for low-income families, helped maintain nutrition, prevented treatment interruptions, and improved tolerance to chemotherapy. ("Total parenteral nutrition in the meal program has been very useful to patients, and the ration program has helped lower treatment abandonment"). Furthermore, access to nutrient-dense supplements and free meal support further stabilized or improved patients' weight and overall health.

Additionally, doctors appreciated individualized diet plans tailored to patient condition, tolerability, and regional food preferences.

Continuous monitoring made possible through the FoodHeals™ app, timely interventions, and caregiver education improved outcomes. Importantly, doctors noted that educating families enhanced intake during treatment and fostered long-term, sustainable dietary habits into survivorship ("Educating patients about nutrition not only helps them understand why certain foods are beneficial but also empowers them to make healthier choices independently. This builds lifelong habits, reducing the need for ongoing interventions").

DISCUSSION

Pediatric oncologists strongly agreed on the critical role of nutrition in cancer care, echoing global evidence that malnutrition worsens treatment tolerance and survival, especially in LMICs.^{4,10-12} In this study, 94% reported improved patient health and 83% noted fewer treatment-related complications, consistent with literature showing reduced toxicity and infections with nutrition support.

The emphasis on tailored nutrition education and sustained dietary support reinforces the need to integrate these services as a core component of pediatric oncology care. Oncologists reported that dedicated nutritionists, individualized dietary plans, and frequent counselling stabilized nutritional status, improved engagement, reduced complications, and lowered abandonment risk. Longitudinal follow-up enabled timely interventions, aligning with literature that calls for ongoing monitoring and adaptive care.⁵

Oncologists reported tangible improvements in the ability of caregivers to understand and manage their child's nutritional needs. Caregiver empowerment, often overlooked in clinical outcomes, emerged as a key driver of adherence to nutritional guidelines and continuity of care.

Oncologists also emphasized that early counselling, individualized dietary plans, and access to high-quality supplements—including enteral and parenteral nutrition—were critical. This aligns with international evidence from programs like International Initiative for Pediatrics and Nutrition (Latin America), WHO/Pan American Health Organization, Italian AIEOP and Alliance Against Cancer, the Polish Society for Clinical Nutrition of Children and the Polish Society of Pediatric Oncology and Hematology and the Indian Association for Parenteral and Enteral Nutrition all of which stress early, multidisciplinary nutrition integration into oncology care.⁵⁻⁹

Key strengths of the survey are its nationwide scope, focus on frontline clinical experience, and robust qualitative insights. A key limitation of this survey is that the survey instrument was not formally validated. As the tool was developed for program feedback, the findings reflect perceived impact and should be interpreted accordingly. However, the consistency of responses across different outcomes and senior clinicians suggests face validity and supports the relevance of the findings. Other limitations include reliance on self-reported data, lack of direct clinical outcomes, and a small, non-random sample, which may limit generalizability.

Despite this, the findings of this study and its implications are clear. Respondents consistently viewed nutrition as essential to treatment tolerance and overall well-being in children with cancer. Therefore, pediatric oncology programs should integrate routine nutrition assessment,

counselling, and follow-up into standard care, supported by trained nutritionists and structured programs.

CONCLUSION

Pediatric oncologists from India report that comprehensive nutrition interventions greatly improve treatment tolerance, reduce complications, and empower families. These findings align with global evidence and reinforce that nutrition support must be a foundational component of childhood cancer care. Clinicians' strong endorsement emphasizes the urgent need for sustained commitment to nutritional care in pediatric cancer programs.

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