

Delivering Hospital-Based Pediatric Palliative Care: The Symptoms, Interventions, and Outcomes for Children With Cancer in Bangladesh

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PURPOSE The majority of pediatric cancer deaths occur in low- and middle-income countries (LMICs). Pediatric palliative care (PPC) focuses on relieving physical, psychosocial, and spiritual suffering throughout the continuum of cancer care and is considered integral to cancer care for children in all settings. There is limited evidence from LMICs about the characteristics, symptoms, and outcomes of children with cancer who receive PPC, which is needed to define the global need and guide the development of these services.

METHODS This retrospective review of clinical records of children who received PPC was conducted during a pilot project (January 2014-August 2015) that implemented a PPC team at a tertiary hospital in Dhaka, Bangladesh. Clinical data on diagnosis, symptoms, treatment status, deaths, and key palliative care interventions were collected and analyzed using descriptive statistics.

RESULTS There were 200 children who received PPC during the pilot project. The most common diagnoses were acute lymphoblastic leukemia (62%) and acute myeloid leukemia (11%). Psychosocial support for children (n = 305; 53%) and management of physical symptoms (n = 181; 31%) were the most common types of interventions provided. The most frequently recorded symptoms were pain (n = 60; 30%), skin wounds (n = 16; 8%), and weakness (n = 9; 5%). The most common medications prescribed were morphine (n = 32) and paracetamol (n = 21).

CONCLUSION A hospital-based PPC service addresses pain and symptom concerns as well as psychosocial needs for children with cancer and their families in a setting where resources are limited. Health care facilities should incorporate palliative care into the care of children with cancer to address the needs of children and their families.

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INTRODUCTION

More than 200,000 children who live in low- or middle-income countries (LMICs) will develop cancer every year.¹ While approximately 80% of children with cancer who live in high-income countries (HICs) are expected to be cured, in LMICs, survival rates may be as much as fourfold lower.² In Bangladesh, there are an estimated 6,000-9,000 new cases of childhood cancer annually, and financial barriers and misperceptions about the incurability of cancer mean that 43% of children diagnosed with cancer do not start treatment or stop treatment prematurely.³

Pediatric palliative care (PPC) seeks to address the physical, emotional, social, and spiritual concerns of children and their families throughout the continuum of cancer treatment, including at the end of life (EOL). Establishing palliative care programs to relieve pain and other symptoms is considered integral to pediatric cancer care in all settings.^{4,5}

For children with cancer, palliative care should not be limited to the EOL period but should begin early in the course of the illness, as evidence from HICs that have shown that early integration of PPC leads to improved symptom management and quality of life.^{6,7} Studies in HICs have revealed that children treated for cancer experience a high burden of symptoms throughout treatment, although studies of children in LMICs are limited.⁸ One study that described the symptoms of children who received PPC in Malawi identified pain, cough, and diarrhea as common symptoms at the time of referral.⁹

Children treated for cancer in LMICs may receive substantial high-intensity treatment at EOL; one study from a cancer hospital in South India reported that 86% of children dying as a result of cancer received high-intensity treatment during the last 30 days of life.¹⁰ Palliative care teams provide expertise in communication, which helps families to better understand their child's complex medical condition, improves

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CONTEXT

Key Objective

To describe the symptoms, treatments, and outcomes for children with cancer who received pediatric palliative care from a specialized team at a tertiary, publicly funded hospital in Bangladesh.

Knowledge Generated

The most common palliative care interventions delivered to children with cancer were physical symptom management (31%) and psychosocial support (53%) through group counseling or play therapy. Pain was the most common physical symptom, with morphine and paracetamol being the most commonly prescribed medications.

Relevance

Pediatric palliative care for children with cancer can be integrated into comprehensive oncological management in a resource-limited setting. Pediatric palliative care programs for children in such settings are urgently needed.

treatment decisions, and reduces exposure to nonbeneficial or harmful treatments.¹¹⁻¹³

There are significant gaps in the availability of palliative care for children with cancer in LMICs, with the same study from South India reporting that only 57% of children who died received any palliative care.¹⁰ Globally, > 98% of children who need palliative care live in LMICs, where very few programs exist to address their needs.¹⁴ Several reviews on the subject have identified successful comprehensive PPC programs in resource-limited settings, including Malawi and Indonesia.^{15,16}

The primary goal of our study was to describe characteristics, pain and symptom needs, palliative care interventions, and outcomes for children who received PPC from a hospital-based team in a resource-limited setting (Dhaka, Bangladesh). The aim is to improve understanding of the clinical trajectories and symptom needs of children with cancer to assist clinicians and policymakers in developing services to address these needs.

METHODS

We conducted a retrospective review of the palliative care, demographic, diagnostic, and treatment status data recorded in the online Pond4Kids database¹⁷ for all children who received care from the PPC team in the Department of Pediatric Hematology and Oncology at Bangabandhu Sheikh Mujib Medical University (BSMMU) between January 2014 and August 2015. During the specified time, palliative care data were recorded by the PPC team in Pond4Kids for all clinical encounters using a standardized template. This template was already available in the database, and it was not possible to develop new templates in Pond4Kids. The template included key areas relevant to palliative care (physical, emotional, psychosocial, and spiritual issues) with lists of common treatments and symptoms as well as space to record additional information as free text. The template had areas to document family decision making (eg, acceptance of palliative care, planning for location of death), the location

of the child's death, and additional comments. This study was approved by the institutional review board of BSMMU (approval number BSMMU/2016/344).

There was a 4-month gap in PPC data collection from September to December 2014 because of the absence of a PPC consultant. The PPC team interventions were categorized as psychosocial support for the child, play program, management of physical symptoms, psychosocial support for the parent/caregiver, and family meeting to plan EOL care. These categories were developed by reviewing the information recorded in the palliative care template without standardized assessments. One PPC encounter could include multiple types of interventions. In all cases, interventions were determined independently by 2 study team members (M.D. and L.P.), and data discrepancies were resolved by review of PPC data from the particular encounter and discussion. These categories of interventions included all the documented PPC interventions.

The PPC team recorded symptoms or concerns as elicited from interviews with children and their caregivers or from written or verbal communication with other physicians. Wherever possible, pain severity was assessed using pain scales and self-report. Efforts were made to include the children in assessments if they could self-report. Information about demographics, diagnosis, and treatment status was recorded in Pond4Kids for all children with cancer between 2012 and 2017, using standardized templates that were completed by the departmental data managers.

All patients were telephoned every 3-6 months by the departmental data managers to inquire about treatment status (alive and continuing treatment, deceased, abandoned treatment, or unable to contact), and this information was recorded in the Pond4Kids database. Follow-up phone calls were continued until August 2016 (1 year after the time period examined in this study), when follow-up was discontinued because of loss of data management funding.

Abandoned treatment was defined as clinical records or a phone call to the caregiver indicating that the child was

not continuing treatment. Unable to contact was defined as the caregiver not being reachable by phone (3 phone calls placed over a 2-week period) and the child was not documented to have returned to the hospital.

Slightly over one half of all births are registered in Bangladesh, and many parents do not have a record of the date of their child's birth.¹⁸ In Pond4Kids, parent's recollection of the child's age was used as a proxy to estimate the child's birthdate.

Setting

BSMMU is a publicly funded tertiary medical referral hospital in Dhaka, Bangladesh, and the Department of Pediatric Hematology and Oncology diagnoses 450 children with cancer annually.³ The department treats children with all types of cancer; however, children with solid tumors are most often treated at two other government tertiary hospitals in Dhaka where radiotherapy is available.³

BSMMU has a 31-bed inpatient unit for pediatric hematology/oncology and an outpatient department. Patients pay a nominal fee for clinical services and investigations, but the majority of medications (including chemotherapy) and medical supplies are not provided by the hospital and must be purchased by the family. Through a twinning partnership supported by World Child Cancer, a PPC service was initiated as a pilot project in 2014-2015, with World Child Cancer providing funding for medications and training as well as technical expertise.

For the pilot project, a PPC service for children with cancer was selected as a model for demonstrating the feasibility of providing PPC at BSMMU. This hospital-based service focused on symptom management and psychosocial support for children and family caregivers because these areas were identified as priorities in consultation with key stakeholders (oncologists, nurses, and family caregivers).

Because of resource limitations, the PPC team focused on inpatients because more children could be seen, and the need for PPC was higher for children who were admitted. These considerations and other features of the pilot project are described in greater detail in our previous publication describing the implementation of this program.¹⁹

The team consisted of 2 physicians (1 PPC consultant, 1 medical officer) and trained volunteers. Volunteers were supervised by the physicians and provided assistance with the play program. Resource limitations and a local shortage of nurses and social workers prevented the team from having dedicated nursing or psychosocial professionals. All nurses working in pediatric oncology at BSMMU received training in basic PPC during the pilot project.

Psychosocial supports were provided individually and in group sessions to children and caregivers. There were weekly group support and information sessions on topics of common concern for parents, including the child's cancer diagnosis, prognosis, and treatment; understanding pain management; and how to care for a child with cancer

(nutrition, hygiene, infection prevention). For children, there were play program sessions using art, music, and play. Individual psychosocial supportive counseling was provided by team physicians.

Referrals

Children could be referred by their physician, nurse, or caregiver or by self-referral. In addition, the PPC team identified children through twice-weekly joint rounds with oncology.

Opioid Availability

Sustained-release oral morphine tablets (15 mg) were available throughout the pilot project, and immediate-release tablets (10 mg) and oral solution (1 mg/mL) became available during the last 4 months (April 2015). Injectable morphine (15 mg/mL) was rarely available. Oral morphine was provided free of charge for patients in the department.

Data Analysis

Data analysis was performed using Microsoft Excel (Microsoft Corporation, Redmond, WA). Data are expressed with descriptive statistics, including mean, standard deviation (SD), and range, or as a percentage of the total number of patients with a response for a particular item.

Availability of Data and Material

The data sets used and/or analyzed are available from the corresponding author upon reasonable request.

RESULTS

Patient Characteristics

During the specified time frame, 200 children received care from the PPC team, and 738 were newly diagnosed with cancer. For those who received palliative care, 128 (64.0%) were male and 70 (35.0%) were female, similar to the sex distribution of all children in the Pond4Kids database (64.5% male, 33.7% female).

The average age of children receiving palliative care was 6.4 years (range, 7 months to 16.8 years). The most common types of cancer among children receiving palliative care were acute lymphoblastic leukemia (ALL; $n = 123$; 61.5%), acute myeloid leukemia ($n = 21$; 10.5%), and non-Hodgkin lymphoma ($n = 16$; 8.0%), which was similar to the cancer diagnoses for all children diagnosed at BSMMU during the same time frame (Table 1).

There were 580 PPC team encounters. Providing psychosocial support for the child ($n = 305$; 52.6.2%) and management of physical symptoms ($n = 181$; 31.2%) were the most common components of palliative care encounters. Table 1 lists additional encounter characteristics.

Complete 1-year treatment status follow-up data were available for 83 children (41.5%), of whom 45 (54.2%) were alive and continuing cancer treatment and 38 (45.8%) had died. The average time between the initial palliative care

TABLE 1. Demographics, Diagnoses, and Characteristics of Encounters With the Palliative Care Team

Characteristic	All Patients Registered in Pond4Kids	
	(n = 738), No. (%)	Patients of the Palliative Care Team (n = 200), No. (%)
Sex (n = 200)		
Male		128 (64.0)
Female		70 (35.0)
Missing		2 (1.0)
Age, years (n = 144) ^a		
Mean		6.4
SD		3.9
Range		0.6-16.8
Type of cancer		
Acute lymphoblastic leukemia	407 (55.1)	123 (61.5)
Acute myeloid leukemia	82 (11.1)	21 (10.5)
Non-Hodgkin lymphoma	74 (10.0)	16 (8.0)
Hepatoblastoma	29 (3.9)	4 (2.0)
Neuroblastoma	26 (3.5)	11 (5.5)
Hodgkin lymphoma	19 (2.6)	1 (0.5)
Chronic myeloid leukemia	19 (2.6)	0 (0.0)
Wilms tumor	17 (2.3)	2 (1.0)
Germ cell tumor	14 (1.9)	6 (3.0)
Ewing sarcoma	14 (1.9)	5 (2.5)
Rhabdomyosarcoma	10 (1.4)	5 (2.5)
Histiocytic tumor	7 (0.9)	1 (0.5)
Osteosarcoma	6 (0.8)	4 (2.0)
Brain tumor ^b	4 (0.5)	1 (0.5)
Retinoblastoma	1 (0.1)	0 (0.0)
Lymphoma, type not specified	1 (0.1)	0 (0.0)
Other solid tumors ^c	4 (0.5)	0 (0.0)
Missing	2 (0.3)	0 (0.0)
Encounters with the palliative care team (n = 580) ^d		
Type of intervention		
Group or individual psychosocial support for child		305 (52.6)
Play program		299 (51.6)
Management of physical symptoms		181 (31.2)
Group or individual psychosocial support for parent/caregiver		152 (26.2)
Family meeting to plan home-based end-of-life care		15 (2.6)

Abbreviation: SD, standard deviation.

^aData about age were missing in 56 patients.

^bIncludes CNS cancers, ependymoma, and medulloblastoma.

^cIncludes teratoma, embryonal carcinoma, and nonrhabdomyosarcoma soft tissue sarcoma.

^dA single encounter could feature multiple forms of intervention.

encounter and the last follow-up was 295 days (SD, 275 days; range, 0-961 days), excluding children who died. Table 2 lists additional information related to treatment status.

Physical Symptom Management

Eighty-two children (40.8%) received physical symptom management during 181 encounters. The most commonly recorded physical symptoms were pain (n = 60; 73.2%), skin problems (n = 16; 19.5%), and weakness (n = 9; 11.0%). Pharmacological and/or nonpharmacological treatments were prescribed in all encounters for physical symptom management. The most commonly prescribed medications were morphine (n = 32; 39.0%), paracetamol (n = 21; 25.6%), and lactulose (n = 14; 17.1%). The route of morphine administration was not documented. The most nonpharmacological strategies were physiotherapy (n = 7; 11.0%) and wound care (n = 14; 17.1%). Additional details on physical symptom management are listed in Table 3.

EOL Care

In total, 44 children were known to have died at the time of the last follow-up (August 29, 2016). Nine deaths (20.4%) occurred in the hospital and 35 (79.6%) at home. Of the children who died in the hospital, 3 (33.3%) were referred in the last 7 days of life and 1 (11.1%) on the day of death. For children who died in the hospital, the mean time between referral and death was 34 days (SD, 39 days; range, 0-111 days).

For 15 of the 44 children who died, the PPC team provided EOL care planning. This occurred in clinical situations where the focus of care was comfort, with no additional potentially curative treatments being provided. For these children, the PPC team developed symptom care plans to enable discharge from the hospital. Ultimately, 14 children (93%) received EOL care at home; 1 child had a rapid clinical deterioration and died in the hospital.

DISCUSSION

We describe the characteristics, patterns of care, outcomes, and palliative care support received by children with cancer who received hospital-based PPC in

a resource-limited setting. The most common interventions were psychosocial support, including therapeutic play, and management of physical symptoms. Opioids were the most commonly prescribed medication.

Tumors of the CNS are the second most common pediatric cancer; however, in our study few children had CNS or other types of solid tumors²⁰ likely because children with solid tumors are typically treated at other tertiary hospitals in Dhaka, as BSMMU does not have radiotherapy capabilities.³ There were proportionally more children with ALL in the palliative care sample than the whole cohort of children with cancer at BSMMU, which may represent the higher use of inpatient care for this group, where the PPC team focused its activities.¹⁹

Psychosocial support was frequently provided to both children and parents. For children, this support was often in the form of therapeutic play. These supports were often provided in a group format because this structure allowed the PPC team to reach more individuals than would otherwise have been possible. A systematic review of the availability of core elements of PPC in LMICs identified only 13 countries where psychosocial care was reported to be available, and in most of these countries, the structure of psychosocial care was not described in detail.¹⁶ One study from Uganda, described the use of play therapy facilitated by volunteers, similar to the structure of our program.²¹ Our play program was low cost and easily implemented with limited resources because it used donated toys and inexpensive locally available art materials. Previous authors described play as an effective nonpharmacological strategy for treating physical symptoms, which could be explored in future studies to evaluate the impact of these supports.²²

We found that pain, skin problems, and weakness were the most common physical symptoms, similar to findings from HICs where pain and weakness are among the most common symptoms in children who have cancer.^{8,23,24} The common symptoms in our study differed from those of children referred to a PPC team in Malawi, where weight

TABLE 2. Patient Status (n = 200)

Patient Status ^a	Days After Initial PPC Consultation, No. (%)				Final Data Update, ^b No. (%)
	30	90	180	365	
Confirmed to be alive	111 (55.5)	94 (47.0)	71 (35.5)	45 (22.5)	156 (78.0)
Confirmed to have died	10 (5.0)	21 (10.5)	27 (13.5)	38 (19.0)	44 (22.0)
Unable to determine ^c	79 (39.5)	85 (42.5)	102 (51.0)	117 (58.5)	0 (0.0)

Abbreviation: PPC, pediatric palliative care.

^aPatient status was determined by combining information gathered from the dates of clinical encounters and regular status updates from scheduled follow-up phone calls. This information was used to calculate the range of the patients' possible lifespans in all cases in which this was possible.

^bAll patients are accounted for by the time of the final data update (August 29, 2016) because the last known status of each patient is used in this category.

^cPatient status for particular time frames was indeterminable in cases in which the patient was only seen once and had not been contacted as part of the regular follow-up program, the patient's status had not been updated beyond a particular time frame, or insufficient time had passed since the initial encounter with the PPC team to determine status for a particular interval.

TABLE 3. Physical Symptoms and Treatments (n = 82)

Variable	Frequency, No. (%)	Encounters to Address Symptom Per Patient	
		Mean (SD)	Range
Physical symptoms			
Pain	60 (73.2)	1.7 (1.3)	1-8
Skin problems or wounds	16 (19.5)	3.4 (3.0)	1-13
Weakness	9 (11.0)	1.2 (0.7)	1-3
Constipation	7 (8.5)	1.5 (1.0)	1-3
Respiratory symptoms			
Itching	2 (2.4)	1.0 (0.0)	1-1
Bleeding	2 (2.4)	1.0 (0.0)	1-1
Seizures	2 (2.4)	1.0 (0.0)	1-1
Weight loss	2 (2.4)	1.0 (0.0)	1-1
Vomiting	1 (1.2)	1.0	1-1
Incontinence	1 (1.2)	2.0	2-2
Spasticity	1 (1.2)	1.0	1-1
Ear problems	1 (1.2)	2.0	2-2
Burn care	1 (1.2)	2.0	2-2
Feeding issues	1 (1.2)	1.0	1-1
Frequency of specific treatments prescribed by PPC ^a			
Morphine	32 (39.0)		
Paracetamol	21 (25.6)		
Stool softeners	14 (17.1)		
Wound care	14 (17.1)		
Topical analgesics	11 (13.4)		
Midazolam	9 (11.0)		
Physiotherapy	7 (8.5)		
Anticipatory symptom kit for home ^b	7 (8.5)		
Antispasmodics and muscle relaxants ^c	5 (6.1)		
Antihistamines	4 (4.9)		
Antibiotics	3 (3.7)		
Gabapentin	2 (2.4)		
Tranexamic acid	2 (2.4)		
PEG 3350	2 (2.4)		
Nasogastric tube	1 (1.2)		
Ear care	1 (1.2)		
Ibuprofen	1 (1.2)		

NOTE. Table lists the number of patients who were documented to have a physical symptom concern.

Abbreviations: PEG, polyethylene glycol; PPC, pediatric palliative care; SD, standard deviation.

^aIncludes all encounters where this treatment was prescribed.

^bKit included morphine, midazolam, paracetamol, and antibiotics.

^cIncludes trihexyphenidyl, baclofen, diazepam, valproic acid, and oxybutynin.

loss, fever, and mouth sores were most common.⁹ These differences may reflect the child's underlying medical condition because in the study in Malawi, 77% had HIV/AIDS and 17% had cancer, while we studied only children with cancer.⁹ Studies from LMICs are essential

to define the global need for PPC because the demographics of suffering and death may differ as a result of reduced access to treatments such as chemotherapy, surgery, and radiation and the presence of other conditions such as malnutrition and HIV/AIDS.

We found that morphine and paracetamol were the most commonly prescribed medications, which is similar to a study of children in the United States and Canada who received hospital-based PPC, where paracetamol (38%) and morphine (15%) were frequently used.²⁵ There are no comparable studies of medication use in LMICs.

Despite being an essential pain medication, oral morphine can be difficult for patients in LMICs to access.²⁶ In Bangladesh, both intravenous and oral (immediate-release tablet and liquid and sustained-release tablet) morphine are included on the national Essential Drug List, but only oral morphine is available in most situations, and no other opioids have been included on the list.^{27,28} The International Narcotics Control Board reported that only 18 kg of morphine was consumed in Bangladesh in 2017, which represents < 1% of the anticipated medical demand for opioids.^{27,29} Overly restrictive opioid policies are a common barrier, and appropriately balanced opioid control policies that provide for medical needs while addressing the risk of nonmedical use must be implemented.^{30,31} The frequent use of opioids, which we observed, may be related to the availability of oral morphine within the department.

Although we did not interview health care providers directly, fear and misinformation among health care providers have been identified as significant barriers to pain management in resource-limited settings and may limit the use of opioids.^{32,33} In a study of adult oncologists in Bangladesh, Khan et al³³ found that few had received any formal training in pain management, and many perceived the delivery of palliative care and pain management as a threat to their career and income. Pediatric oncologists may also be hesitant to prescribe opioids, as a study of children who died as a result of cancer in India found that only those seen by PPC received opioids at EOL.¹⁰ Targeted training for

health care providers about the safe use of opioids for pain management has been shown to improve the use of opioids in these settings.^{4,31}

A limitation of our study is that data collection was done by retrospective review of medical records and did not include any information gathered directly from patients or families. Despite regular telephone calls, many patients were lost to follow-up, which is a common problem in resource-limited settings where large geographical distance and treatment-related costs represent significant barriers to continuing medical treatment.³⁴ We were unable to assess the impact of PPC on patient outcomes because there is no cancer registry in Bangladesh to provide a group for comparison. The inclusion of all children with cancer who received PPC at BSMMU limited comparison with a historical cohort. Accurate estimations of mortality as a result of cancer in Bangladesh are limited; 1 study estimated that 50%-60% of children treated for ALL are cured but did not provide any data to support this estimate.³

Additional research should evaluate the effects of PPC for children with cancer in resource-limited settings and aim to better understand the knowledge, skills, and attitudes of pediatric clinicians toward opioids and palliative care. Efforts to further explore the prevalence of pain and other symptoms among children with cancer and other life-limiting illnesses, particularly for children who may receive limited cure-directed treatment, are needed.

In conclusion, our findings provide evidence of the activities that a hospital-based PPC team may provide to support children with cancer in a resource-limited setting. These include managing symptoms, providing psychosocial support for children and their parents, and facilitating discharge from the hospital for children nearing EOL.

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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

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