

Review began 09/29/2026

Review ended 10/12/2026

Published 10/18/2026

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DOI: 10.7759/cureus.118133

Quality of Life Among Mothers Caring for Children With Cancer at a Tertiary Cancer Hospital in Bangladesh: A Cross-Sectional Study

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Abstract

Background

Mothers caring for children with cancer often assume intensive clinical, emotional, and household responsibilities. Evidence on their cancer-related quality of life in Bangladesh remains limited. This study assessed caregiver quality of life and its relationships with maternal, household, and caregiving characteristics.

Methods

This hospital-based cross-sectional study was conducted among 178 mothers at the National Institute of Cancer Research and Hospital, Dhaka, from July 2018 to June 2019 using convenience sampling. Face-to-face interviews collected sociodemographic and caregiving data. Quality of life was measured using a 34-item modified Caregiver Quality of Life Index-Cancer (CQOLC)-derived score (range 0-136); under the study-specific coding, higher scores represented poorer quality of life. Descriptive statistics, Pearson correlations, and comparisons of mean scores across subgroups were used in this exploratory analysis, and all associations were unadjusted.

Results

Participants had a mean age of 30.20 years (SD 5.98); 166 (93.3%) were homemakers, and 161 (90.4%) lived in nuclear families. Mean daily caregiving time was 9.38 hours (SD 2.54). The median modified CQOLC-derived total score was 80 (range 51-108). Higher total scores were correlated with more daily caregiving hours ($r = 0.366$, $p < 0.001$), longer caregiving duration ($r = 0.192$, $p = 0.010$), and older maternal age ($r = 0.165$, $p = 0.027$), whereas monthly household income was inversely correlated with the total score ($r = -0.183$, $p = 0.014$). Mean total scores also differed by housing type ($p = 0.006$).

Conclusions

Within this sample, greater daily caregiving time showed the strongest relationship with poorer study-specific quality-of-life scores; longer caregiving duration, older maternal age, and lower household income were also weakly associated with poorer scores. The findings suggest that caregiver screening and practical and psychosocial support may be useful in pediatric oncology, but they should be interpreted cautiously because of the modified instrument without reliability testing, the cross-sectional design, and single-center sampling.

Categories: Oncology

Keywords: bangladesh, caregivers, caregiving burden, childhood cancer, cqolc, mothers, quality of life

Introduction

Childhood cancer is relatively uncommon, but its consequences are profound because treatment is prolonged, technically demanding, and embedded in family life. Global projections indicate that millions of children will develop cancer between 2020 and 2050, with most preventable deaths concentrated in low- and middle-income countries (LMICs) [1]. Survival inequities reflect delayed diagnosis, restricted access to essential medicines, treatment abandonment, and gaps in supportive care. Beyond these gaps in the health system, much of the daily work of cancer care falls on families. During repeated admissions and outpatient treatment, parents coordinate appointments, monitor symptoms, administer medicines, provide nutrition and emotional reassurance, and sustain household responsibilities [1-3].

How to cite this article

Akter F, Sultana K, Afroz R, et al. (October 18, 2026) Quality of Life Among Mothers Caring for Children With Cancer at a Tertiary Cancer Hospital in Bangladesh: A Cross-Sectional Study. Cureus 18(10): e118133. DOI 10.7759/cureus.118133

Mothers commonly become the principal caregiver, particularly where gendered family roles place daily childcare and bedside attendance on women. Studies describe anxiety, depression, sleep disturbance, social isolation, disrupted employment, and financial strain among caregivers of children with cancer [4,5]. Quality of life provides a multidimensional outcome that extends beyond distress alone; the Caregiver Quality of Life Index-Cancer (CQOLC) was developed to assess the physical, emotional, social, and financial consequences of cancer caregiving [6]. Caregiver outcomes have also been linked to family context, social support, and household resources [7,8].

These pressures are especially relevant in Bangladesh, where pediatric oncology services are concentrated in tertiary centers and many families must travel, reorganize work, and absorb direct and indirect costs. Bangladeshi evidence documents income loss, debt, reduced family interaction, and interruption of siblings' education after childhood cancer [2]. Evidence from another setting also links children's physical and psychosocial symptoms with greater parental caregiver burden [9], while a South Asian tertiary-center study documented caregiver psychological distress during COVID-19-related treatment disruption [10]. Quantitative evidence focused specifically on mothers' cancer-related quality of life in Bangladesh nevertheless remains scarce. Without locally measured caregiver outcomes, services cannot readily identify families who may need additional practical or psychosocial support.

The CQOLC provides a cancer-specific framework for examining these overlapping effects. Recent validation work supports its use for assessing burden, disruptiveness, positive adaptation, and financial concerns in caregivers, although culturally adapted administration and transparent scoring remain essential [6]. Identifying correlates of poorer scores may help pediatric oncology teams target practical support rather than relying only on informal observation. Daily caregiving hours, duration of care, income, housing conditions, family structure, and the child's diagnosis are plausible markers of unequal exposure to strain, but their relationships have not been adequately described among Bangladeshi mothers. This exploratory study therefore aimed to describe cancer-related quality of life, measured as a study-specific modified CQOLC-derived score rather than the standard validated CQOLC score, among mothers caring for children with cancer at Bangladesh's national cancer referral hospital and to examine its correlations and subgroup differences with maternal sociodemographic characteristics, caregiving intensity, family context, and the child's cancer type. The analysis was intended to identify correlates rather than predictors or causal factors.

Materials And Methods

Study design and setting

A hospital-based cross-sectional study was conducted at the National Institute of Cancer Research and Hospital (NICRH), Mohakhali, Dhaka, Bangladesh, from July 2018 to June 2019. NICRH is a national tertiary referral center that receives children with hematological and solid malignancies from across Bangladesh.

Participants and sampling

The study population comprised mothers who were providing direct care to a child receiving cancer treatment at NICRH. Mothers who agreed to participate and provided written informed consent were eligible. Mothers who were too ill to complete the interview or had a documented psychiatric condition that precluded participation were excluded. Participants were recruited by convenience sampling. Mothers who were attending NICRH with their child for cancer treatment during the data collection period were approached in person by the principal investigator, who explained the purpose and procedures of the study and confirmed eligibility before the interview. No eligible mother who was approached declined to participate.

The sample size was calculated using the following formula: $n = \frac{Z_{\alpha/2}^2 p(1-p)}{d^2}$. Using a 95% confidence level ($Z_{\alpha/2} = 1.96$), an anticipated proportion of good quality of life of 52.8%, and an absolute precision of 7.5%, based on a previous study by Warapornmongkholkul et al. [11], the required sample size was calculated as: $n = \frac{(1.96)^2 \times 0.528 \times (1 - 0.528)}{(0.075)^2} = 170.20$

Accordingly, after rounding up, a minimum sample size of 171 mothers was required [11]. Eligible mothers were recruited using convenience sampling during the study period. A total of 178 mothers completed the interviews, all of whom were included in the final analysis. The proportion-based formula was used because the primary descriptive objective of the study was to assess the level of quality of life among mothers. Because one item was omitted and the scoring direction was changed, no validated cutoff could be applied, so the present analysis reports continuous scores and examines their correlations and subgroup differences as exploratory objectives. To check whether the achieved sample was adequate for the correlation analyses, a sensitivity calculation based on the Fisher z transformation was performed using the following formula, where r is the correlation coefficient to be detected and $Z\beta = 0.84$ for 80% power: $n = \left(\frac{Z_{\alpha/2} + Z_{\beta}}{r} \right)^2 + 3$,

$\quad \text{where} \quad$

$C = \frac{1}{2} \ln \left(\frac{1+r}{1-r} \right)$. With a significance level of 0.05 (two-tailed) and 80% power, a minimum of 124 mothers would be required to detect a correlation of 0.25, and the achieved sample of 178 mothers was sufficient to detect a correlation coefficient of about 0.21 or larger. The sample was therefore adequate for small to moderate correlations, whereas correlations weaker than this threshold should be interpreted with caution.

Measures

A semi-structured questionnaire, administered face-to-face by the principal investigator, recorded maternal age, religion, education, occupation, monthly household income, family type, housing type, caregiving duration, daily caregiving hours, the child's cancer type, and treatment modalities. Caregiver quality of life was measured using a modified version of the CQOLC, the copyrighted instrument originally developed and validated by Weitzner et al. [6]. The validated instrument contains 35 items scored from 0 to 4; after reverse scoring specified items, the total ranges from 0 to 140, and higher scores indicate better quality of life [6]. The item concerning sexual life was omitted because it was considered culturally sensitive, leaving 34 administered items and a theoretical range of 0-136. In this study, the composite was coded in the adverse direction, with higher values representing poorer quality of life. Because the item omission and scoring direction differ from the validated instrument, the outcome is reported as a modified CQOLC-derived score and should not be compared directly with standard CQOLC values. The CQOLC was translated into Bangla and modified to a 34-item version with revised scoring, and both the translation and the modification were carried out with written permission from the developer, Dr. Michael Weitzner.

Subscale scores followed the original four-factor structure of the CQOLC [6]. The burden subscale comprised 10 items (theoretical range 0 to 40), the disruptiveness subscale 7 items (0 to 28), the positive adaptation subscale 7 items (0 to 28), and the financial concern subscale 3 items (0 to 12). The remaining seven administered items do not load on any of the four factors in the original instrument and contributed only to the total score. The omitted item on sexual life is also one of the items that do not load on a factor, so all four subscales retained their full item sets. Each item was scored from 0 to 4 under the study-specific coding; each subscale score was calculated as the unweighted sum of its items, and the total score was calculated as the unweighted sum of all 34 administered items.

Data collection and quality assurance

The questionnaire was administered face-to-face in Bangla by the principal investigator. It was pretested among 20 mothers at Ahsania Mission Cancer and General Hospital, Mirpur, Dhaka, to check the comprehension, wording, and cultural acceptability of the translated items, and it was revised for clarity before data collection. Formal psychometric revalidation of the modified Bangla version, including reliability testing, was not undertaken. The principal investigator reviewed completed questionnaires for completeness and internal consistency.

Statistical analysis

Data were analyzed using IBM SPSS Statistics for Windows, Version 25 (Released 2017; IBM Corp., Armonk, New York, United States). Categorical variables are presented as frequencies and percentages. Continuous variables are summarized using mean, standard deviation (SD), median, and observed range, as appropriate. Pearson correlation coefficients quantified linear relationships between maternal age, monthly household income, caregiving duration, daily caregiving hours, and the modified CQOLC-derived total and subscale scores. Mean total scores were compared across categories of maternal education, family type, housing type, and the child's cancer type using one-way analysis of variance or the independent samples t test, as appropriate. Tests were two-sided, and $p < 0.05$ was considered statistically significant. No multivariable analysis was performed; all reported associations are unadjusted.

Ethical considerations

The protocol was approved by the Institutional Review Board of the National Institute of Preventive and Social Medicine (NIPSOM), Dhaka (approval no: NIPSOM/IRB/2018/471). Administrative permission was obtained from NICRH. All participants received an explanation of the study and provided written informed consent. Participation was voluntary, and confidentiality and privacy were maintained.

Results

The mean age of the participants was 30.20 years (SD 5.98; range 20-45), and 101 (56.7%) were aged 20-30 years. Most were Muslim (167, 93.8%), married (178, 100%), homemakers (166, 93.3%), and members of nuclear families (161, 90.4%). Mean monthly household income was Bangladeshi taka (BDT) 20,269.66 (SD 11,078.83; range 7,000-60,000). Participant characteristics are summarized in Table 1.

Characteristic	Category	n	%
Age, years	20-25	46	25.8
	26-30	55	30.9
	31-35	45	25.3
	36-40	25	14.0
	41-45	7	3.9
Religion	Muslim	167	93.8
	Hindu	11	6.2
	No formal schooling	14	7.9
Education	Informal education	9	5.1
	Primary	49	27.5
	Secondary	31	17.4
	SSC/equivalent	29	16.3
	HSC/equivalent	23	12.9
Occupation	Graduate	19	10.7
	Postgraduate	4	2.2
	Homemaker	166	93.3
Monthly household income, BDT	Service	12	6.7
	7,000-10,000	29	16.3
	10,001-20,000	88	49.4
	20,001-30,000	35	19.7
	30,001-40,000	16	9.0
Family type	40,001-50,000	6	3.4
	50,001-60,000	4	2.2
	Nuclear	161	90.4
Housing type	Joint	17	9.6
	Kancha	19	10.7
	Semi-pucca	78	43.8
	Pucca	81	45.5

TABLE 1: Sociodemographic and household characteristics of participating mothers (N=178)

Age: mean 30.20 years (SD 5.98), range 20-45. Monthly household income: mean BDT 20,269.66 (SD 11,078.83), range 7,000-60,000.

Housing type follows standard Bangladeshi construction categories: kancha, a dwelling built entirely of non-durable materials such as mud, unbaked earth, bamboo, thatch, or straw; semi-pucca, a dwelling combining durable elements (for example, brick or cement walls or floor) with non-durable walls or roofing such as corrugated iron sheeting; and pucca, a dwelling constructed throughout of durable materials, typically brick or cement walls with a concrete or reinforced roof.

SSC: Secondary School Certificate; HSC: Higher Secondary Certificate; BDT: Bangladeshi taka

Mothers had provided care for a mean duration of 6.19 months (SD 5.63; range 0.5-30) and for a mean of 9.38 hours per day (SD 2.54; range 4-14). More than half (96, 53.9%) reported at least 10 hours of daily caregiving. Leukemia was the most frequent diagnosis (62, 34.8%), followed by malignant bone tumors (37, 20.8%). Chemotherapy was reported for 164 (92.1%) of children; treatment categories were not mutually

exclusive (Table 2). Because 228 treatment responses were recorded for 178 children, some children received more than one modality. Based on these counts, at least 33 children (18.5%) received chemotherapy combined with surgery, and at least 100 (56.2%) received chemotherapy alone; the frequency of each specific treatment combination was not tabulated separately.

Characteristic	Category	n	%
Caregiving duration, months	0.5-10	145	81.5
	10.1-20	27	15.2
	20.1-30	6	3.4
Daily caregiving, hours	4-6	27	15.2
	7-9	55	30.9
	10-12	75	42.1
	13-15	21	11.8
Cancer type	Leukemia	62	34.8
	Malignant bone tumor	37	20.8
	Lymphoma	17	9.6
	Soft-tissue sarcoma	16	9.0
	Nephroblastoma	10	5.6
	Retinoblastoma	9	5.1
	Germ-cell/gonadal tumor	7	3.9
	CNS/nerve-cell tumor	6	3.4
	Other	14	7.9
	Chemotherapy	164	92.1
Treatment modality*	Surgery	47	26.4
	Radiotherapy	17	9.6

TABLE 2: Caregiving intensity, childhood cancer type, and treatment (N=178)

Caregiving duration: mean 6.19 months (SD 5.63), range 0.5-30. Daily caregiving: mean 9.38 hours (SD 2.54), range 4-14. *Multiple responses were permitted; based on the marginal counts, at least 33 children (18.5%) received chemotherapy with surgery, and at least 100 (56.2%) received chemotherapy alone.

CNS: central nervous system

The median modified CQOLC-derived total score was 80 (range 51-108), indicating moderate variability in caregiver quality-of-life scores. As higher scores represented poorer quality of life in the study-specific adverse-direction scoring system, greater total scores reflected a higher overall caregiving-related burden. Among the subscales, the median scores were 28 (range 14-40) for burden, 17 (range 4-26) for disruptiveness, 13 (range 3-20) for positive adaptation, and 8 (range 2-8) for financial concern (Table 3).

Scale	Items (theoretical range)	Median	Observed range
Modified CQOLC-derived total	34 (0-136)	80	51-108
Burden	10 (0-40)	28	14-40
Positive adaptation	7 (0-28)	13	3-20
Disruptiveness	7 (0-28)	17	4-26
Financial concern	3 (0-12)	8	2-8

TABLE 3: Modified CQOLC-derived total and subscale scores

The total score used 34 items (theoretical range 0-136) with study-specific adverse-direction coding; higher values indicate poorer quality of life in this dataset. The median with observed range is reported. Item allocation followed the original CQOLC factor structure; the seven administered items that do not load on any factor contribute to the total score only.

CQOLC: Caregiver Quality of Life Index-Cancer

Daily caregiving hours showed the largest observed correlation with the modified total score ($r = 0.366, p < 0.001$). Higher total scores were also weakly correlated with older maternal age ($r = 0.165, p = 0.027$) and longer caregiving duration ($r = 0.192, p = 0.010$), whereas monthly household income was inversely correlated with the total score ($r = -0.183, p = 0.014$). Daily caregiving hours were positively correlated with the burden, disruptiveness, and financial concern subscale scores. All correlations were unadjusted (Table 4).

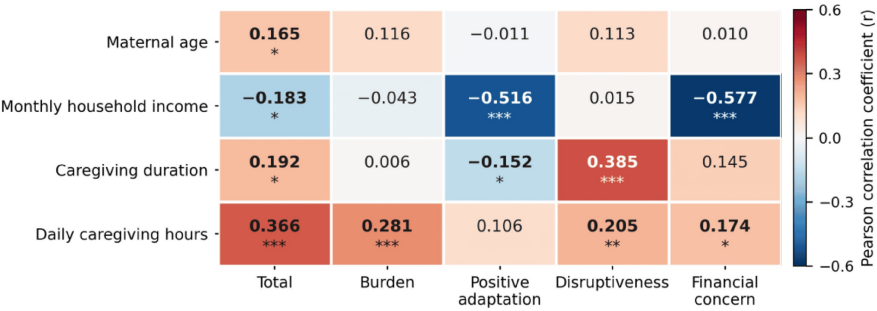
Variable	Total	Burden	Positive adaptation	Disruptiveness	Financial concern
Maternal age	0.165 (0.027)	0.116 (0.124)	-0.011 (0.884)	0.113 (0.134)	0.010 (0.890)
Monthly income	-0.183 (0.014)	-0.043 (0.568)	-0.516 (<0.001)	0.015 (0.845)	-0.577 (<0.001)
Caregiving duration	0.192 (0.010)	0.006 (0.941)	-0.152 (0.043)	0.385 (<0.001)	0.145 (0.053)
Daily caregiving hours	0.366 (<0.001)	0.281 (<0.001)	0.106 (0.160)	0.205 (0.006)	0.174 (0.020)

TABLE 4: Pearson correlations with modified CQOLC-derived total and subscale scores

Values are Pearson r (p-value). Under the study-specific coding, higher total scores represent poorer quality of life. Subscale directionality was not revalidated after modification of the instrument; subscale coefficients should therefore be interpreted cautiously

CQOLC: Caregiver Quality of Life Index-Cancer

The complete correlation matrix is displayed as a heat map in Figure 1, and the corresponding coefficients with 95% confidence intervals are shown in Figure 2.



*p < 0.05; **p < 0.01; ***p < 0.001. Values are Pearson r; bold r values are statistically significant.

FIGURE 1: Heat map of Pearson correlation coefficients between maternal and caregiving characteristics and modified CQOLC-derived total and subscale scores (N=178)

Cell color indicates the direction and magnitude of r (red, positive; blue, inverse); coefficients shown in bold are statistically significant. *p < 0.05; **p < 0.01; ***p < 0.001. Under the study-specific adverse-direction coding, higher scores indicate poorer quality of life.

CQOLC: Caregiver Quality of Life Index-Cancer

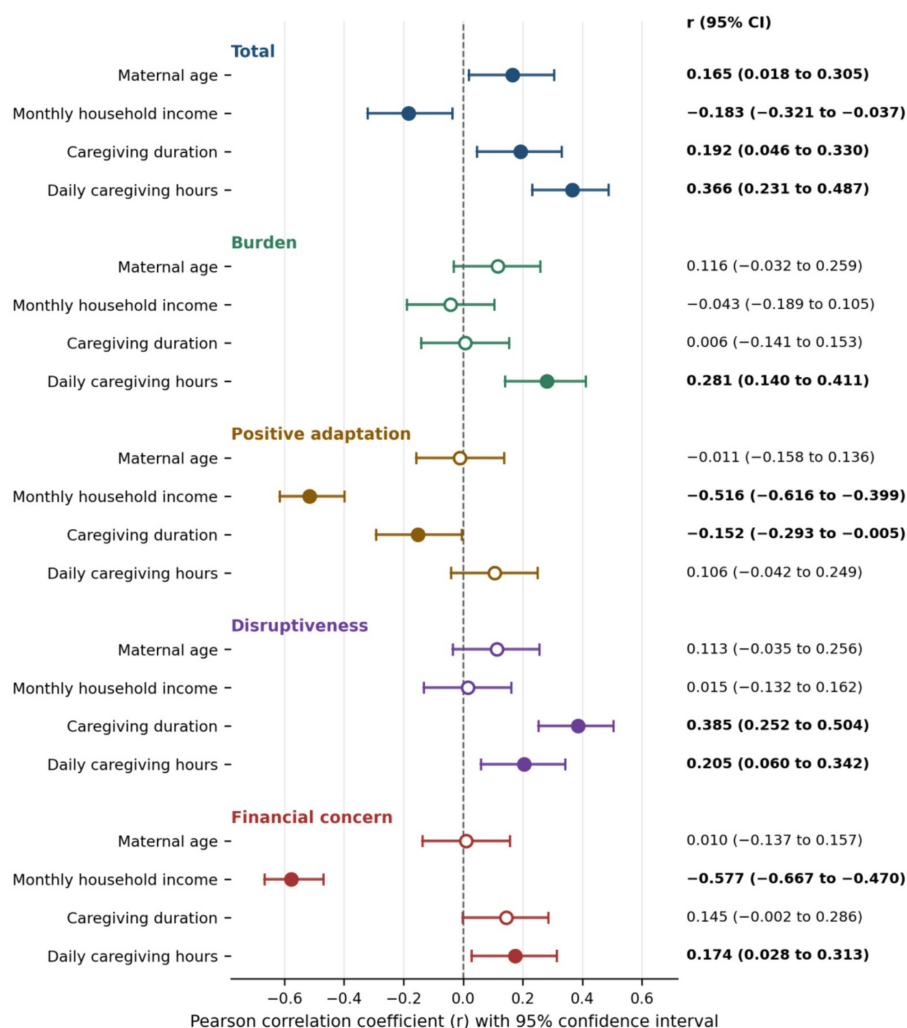


FIGURE 2: Forest plot of Pearson correlation coefficients with 95% confidence intervals for associations between maternal and caregiving characteristics and modified CQOLC-derived total and subscale scores (N=178)

Filled markers indicate $p < 0.05$; open markers indicate $p \geq 0.05$. All correlations are unadjusted.

CI: confidence interval; CQOLC: Caregiver Quality of Life Index-Cancer

Mean modified CQOLC-derived total scores differed across housing types ($F(2, 175) = 5.26, p = 0.006$), with the highest mean among mothers living in semi-pucca housing (83.10) and lower means among those in kancha (78.58) and pucca (77.44) housing. Mean total scores were lower among mothers educated above the Higher Secondary Certificate (HSC) level (74.65) than among those with no formal or only informal schooling (82.70), but the overall difference across education groups did not reach statistical significance ($F(3, 174) = 2.45, p = 0.065$). Mothers in nuclear families had a higher mean total score than those in joint families (80.43 and 76.35, respectively), although this difference was not statistically significant ($t(176) = 1.40, p = 0.163$). Differences across the child's cancer type were also not statistically significant ($F(8, 169) = 1.87, p = 0.068$), and several diagnostic groups were small. Occupation was not compared formally because only 12 mothers (6.7%) were in paid employment (Table 5).

Characteristic	Category	n	Mean total score	Test statistic	p value
Education	No formal or informal schooling	23	82.70	F(3, 174) = 2.45	0.065
	Primary	49	81.55		
	Secondary to HSC	83	79.92		
	Graduate or postgraduate	23	74.65		
Family type	Nuclear	161	80.43	t(176) = 1.40	0.163
	Joint	17	76.35		
Housing type	Kancha	19	78.58	F(2, 175) = 5.26	0.006
	Semi-pucca	78	83.10		
	Pucca	81	77.44		
Cancer type*	Leukemia	62	78.74	F(8, 169) = 1.87	0.068
	Malignant bone tumor	37	80.76		
	Lymphoma	17	79.00		
	Soft-tissue sarcoma	16	81.38		
	Nephroblastoma	10	85.40		
	Retinoblastoma	9	73.89		
	Germ-cell/gonadal tumor	7	73.57		
	CNS/nerve-cell tumor	6	91.00		

TABLE 5: Modified CQOLC-derived total scores across maternal, household, and clinical subgroups (N=178)

Values are the means of the modified CQOLC-derived total score (theoretical range 0-136); higher values indicate poorer quality of life under the study-specific coding. Groups were compared using one-way analysis of variance (F) or the independent-samples t test (t), and all comparisons are unadjusted.

*The other cancer category (n = 14) was included in the analysis of variance, but its mean is not shown. Occupation is not shown because only 12 mothers were in paid employment.

HSC: Higher Secondary Certificate; CNS: central nervous system; CQOLC: Caregiver Quality of Life Index-Cancer

Discussion

This study describes caregiver quality of life among 178 mothers accompanying children for cancer treatment in Bangladesh. The median modified CQOLC-derived score was 80. Because one item was omitted and the scoring direction differed from the validated CQOLC, the absolute value cannot be interpreted against standard CQOLC values or used to estimate the prevalence of poor quality of life. Interpretation therefore rests on relationships observed within this sample. The caregiving demands reported here are consistent with research describing substantial caregiver burden, psychological distress, and family strain during childhood cancer treatment in several LMIC settings [12-17].

Daily caregiving time had the strongest observed relationship with the modified total score and was also correlated with burden, disruptiveness, and financial concern. Intensive bedside care may constrain sleep, paid work, attention to other children, and opportunities for recovery. Other studies likewise report greater caregiver burden or distress in relation to demanding symptoms, longer daily care, and disrupted family roles [8,9,18]. The cross-sectional association cannot establish causality, but daily caregiving time may be a useful question in an initial caregiver needs assessment.

Longer caregiving duration and older maternal age had weaker correlations with poorer modified total scores. Caregiving duration was most strongly related to the disruptiveness subscale as coded, which may reflect accumulated interruption of daily life. Evidence on time since diagnosis is mixed because cumulative fatigue may coexist with developing coping skills. Recent studies identify resilience, illness perceptions, social support, and treatment context as relevant to parental adaptation [3,19,20]. Longitudinal research is

needed to distinguish early crisis, adaptation, and chronic strain.

Higher household income was correlated with a lower modified total score, indicating better quality of life under the study-specific coding. The strong inverse correlations with the positive-adaptation and financial-concern subscales should be interpreted cautiously because the modified subscale direction was not revalidated. The overall income finding is consistent with Bangladeshi evidence of out-of-pocket expenditure, income loss, borrowing, and household disruption [2,10,21,22], as well as studies from India and Ethiopia that identified low income or unemployment as markers of poorer caregiver outcomes [3,16,23]. Financial navigation, transport and accommodation support, and linkage to charitable or governmental assistance may therefore be relevant components of family-centered care.

Housing type was the only categorical characteristic with a statistically significant difference in mean total scores, with the highest mean among mothers in semi-pucca housing. Because this pattern was not graded across housing categories and the kancha group was small, the finding should be interpreted cautiously; housing type may reflect material insecurity or other household pressures rather than exert a direct effect. Mothers in nuclear families had a higher mean total score than those in joint families, but the difference was not statistically significant, so the possible protective role of shared caregiving within extended families remains uncertain. Qualitative evidence from Ghana and quantitative work on advanced pediatric cancer emphasize family cohesion and social support as protective resources [18,24]. Mean scores were lower among mothers educated above the HSC level, which may suggest that education contributes to household resilience, although this difference did not reach statistical significance, and employment could not be examined because few mothers were in paid employment. Differences across cancer types were also not statistically significant and were based on small diagnostic subgroups; they may reflect treatment intensity, symptoms, prognosis, or chance and should not guide diagnosis-specific conclusions.

The findings suggest that a stepped, family-centered response may be useful, including brief screening of caregiver time, financial strain, and distress; rapid social-work referral; practical education; peer support; and scheduled respite where feasible. Empowerment and technology-supported interventions show promise, but require local adaptation and evaluation [21,25-27]. Accordingly, service planning should prioritize modifiable pressures while avoiding unsupported causal or prognostic interpretations.

This study has several strengths. To the best of our knowledge, it is among the first hospital-based studies to quantify cancer-related quality of life specifically among mothers caring for children with cancer in Bangladesh, and it was carried out at the national tertiary referral center that receives children from across the country. The achieved sample of 178 mothers exceeded the calculated requirement, and all interviews were conducted face-to-face by the principal investigator using a pretested questionnaire, which limited missing data and reduced literacy-related barriers to participation. We also reported the instrument modification and the scoring direction transparently, so that the findings are not misread as standard CQOLC values. However, this study also has several limitations. First, and most importantly, the quality-of-life instrument was modified by omitting one item and reversing the scoring direction, and the modified Bangla version was not revalidated. Its internal consistency, including Cronbach's alpha, was not estimated, no validated cutoff could be applied, and subscale directionality was not confirmed. The scores are therefore not directly comparable with those of previously published CQOLC studies, and the subscale findings in particular should be regarded as provisional. Second, the cross-sectional design cannot establish causality between caregiving exposure and quality of life, and longitudinal work is therefore needed. Third, convenience sampling at a single tertiary hospital limits generalizability, and the treatment setting at the time of interview, inpatient or outpatient, was not recorded. Fourth, the sample size was calculated for estimating a proportion rather than for correlation analysis; although the sample could detect correlations of about 0.21 or larger with 80% power, the weaker correlations with maternal age, household income, and caregiving duration fell below this threshold. In addition, multiple correlations and subgroup comparisons were examined without adjustment for multiple testing, so some of the weaker associations may be chance findings. Fifth, subgroup comparisons were unadjusted, and several categories were small; occupation could not be compared because few mothers were employed, and the specific combinations of treatment modalities were not analyzed. Finally, all associations were unadjusted, fathers and other caregivers were excluded, and the data were collected in 2018, so unmeasured confounding and changes in the service context cannot be ruled out.

Conclusions

Among mothers caring for children with cancer at a tertiary hospital in Bangladesh, greater daily caregiving time was the strongest observed correlate of poorer study-specific quality-of-life scores. Longer caregiving duration, older maternal age, and lower household income were also weakly associated with poorer scores, and mean scores differed by housing type. These weaker associations should be regarded as exploratory, and all relationships were unadjusted and cannot establish causality. Pediatric oncology services may wish to consider assessing caregiver time demands and financial strain and linking families to practical and psychosocial support. Future multicenter longitudinal studies should use a fully validated Bangla CQOLC, retain standard scoring, report its reliability, include fathers and other caregivers, compare family, socioeconomic, and clinical subgroups formally, and apply adjusted analyses.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Fahmida Akter, Khandoker Kashfia Sultana, Rumana Afroz, Fayela Sabrun Siddiquee, Tamanna Tabassum Juhee, Dilruba Yesmin Any, S. M. Sarwar Jahan Sarker, Marzana Ferdousi, Most. Sharmin Rejowana, Tasnia Jahan Siddiqua

Acquisition, analysis, or interpretation of data: Fahmida Akter

Drafting of the manuscript: Fahmida Akter

Critical review of the manuscript for important intellectual content: Fahmida Akter, Khandoker Kashfia Sultana, Rumana Afroz, Fayela Sabrun Siddiquee, Tamanna Tabassum Juhee, Dilruba Yesmin Any, S. M. Sarwar Jahan Sarker, Marzana Ferdousi, Most. Sharmin Rejowana, Tasnia Jahan Siddiqua

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. The Institutional Review Board of the National Institute of Preventive and Social Medicine (NIPSOM) issued approval NIPSOM/IRB/2018/471. **Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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