



# Effectiveness of Psychosocial Intervention on Quality of Life of Mothers of Children with Cancer: A Feasibility Study

Seema S. Chavan<sup>1,2,3</sup> Theresa L. Mendonca<sup>1,2,3</sup>

<sup>1</sup> Department of Pediatric Nursing, Father Muller College of Nursing, Mangaluru, Karnataka, India

<sup>2</sup> Department of Pediatric Nursing, Laxmi Memorial College of Nursing, Mangaluru, Karnataka, India

<sup>3</sup> Rajiv Gandhi University of Health Sciences, Bengaluru, Karnataka, India

**Address for correspondence** Seema S. Chavan, MSc, Department of Pediatric Nursing, Father Muller College of Nursing, Mangaluru 575002, India (e-mail: seemachavan@fathermuller.in).

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## Abstract

**Background** Mothers of children with cancer are reported to experience stress more often. For children with cancer, parents are the primary source of social and emotional support, and they are also in charge of how successfully patients manage their illness. The degree of difficulty parents suffer after learning that their child has cancer significantly influences the child's psychological adjustment.

**Aim** The study aimed to assess the effectiveness of psychosocial intervention on quality of life (QoL) among mothers of children with cancer.

**Materials and Methods** Quasi-intervention study design was undertaken, and a purposive sampling technique was used to select the 60 mothers of children with cancer who were assigned randomly to the intervention and control groups. A pretested and validated self-administered questionnaire was used; the sociodemographic, WHOQOL-BREF scale with 26 items was studied.

**Statistical Analysis** Prevalence, demographic pro forma of mother and child was analyzed in terms of frequency, percentage, mean, and standard deviation. Two-factor repeated measures analysis of variance was used to establish the effectiveness of the psychosocial intervention on QoL. Association was done by using the chi-square test. SPSS package was used for analysis.

**Results** Psychosocial intervention was found to be effective in improving QoL scores in psychological health domain ( $p = 0.02^*$ ,  $p < 0.05$ ), social relationship domain ( $p = 0.04^*$ ,  $p < 0.05$ ), and environmental health domain ( $p = 0.001^{**}$ ,  $p < 0.05$ ). A significant association was found between the physical health domain and information on cancer ( $p = 0.01^*$ ), psychological health domain and financial status ( $p = 0.03^*$ ), social relationship domain and cost of treatment ( $p = 0.04^*$ ), Q1 and Q2 with the place of residence ( $p = 0.004^{**}$ ,  $p = 0.02^*$ ), and Q2 and financial status ( $p = 0.03^*$ ).

## Keywords

- ▶ psychosocial intervention
- ▶ cancer
- ▶ children
- ▶ mothers
- ▶ quality of life

\* is significant

\*\* highly significant

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**Conclusion** Mothers of children with cancer undergo a lot of stress and emotional turmoil and are at risk of deteriorating their QoL. Hence, they need to be provided support to address their issues. Thus, health professionals must develop and implement interventions to promote the QoL.

## Introduction

Parents of children with serious illnesses go through a lot of worry and anxiety.<sup>1</sup> In parents of cancer patients, psychological distress is common during the child's therapy, and once the course of treatment is complete, parents report higher levels of anxiety, depression, and posttraumatic stress than the general population.<sup>2-5</sup> Few programs have, to date, particularly aimed to improve parent's well-being.<sup>5</sup>

The definition of quality of life (QoL) is how people view their place in the world concerning their objectives, aspirations, standards, and worries, as well as the culture and value systems in which they live.<sup>6</sup> A study done in Sri Lanka revealed that more than 50% of parents of children with leukemia had a poor QoL.<sup>7</sup>

When parents' concern is substantial, referrals to qualified psychosocial therapists outside a pediatric hospital setting are typical forms of help. Delivering interventions at this time is challenging, despite parental support for seeking assistance when their kid first develops cancer.<sup>8</sup> Positive psychological resources are the focus of interventions with greater potential.<sup>9,10</sup> An important concept called resilience outlines how someone uses resources to maintain their physical or psychological health in the face of adversity.<sup>11</sup> Parental self-perceptions of resilience have been linked to clinically significant outcomes, such as psychological discomfort, health-related behaviors, and comfort in sharing values with the medical staff.<sup>12</sup> Promoting one's resources for resiliency, such as stress management techniques, goal-setting strategies, problem-solving techniques, cognitive restructuring techniques, and meaning-making techniques, may help improve one's QoL and health-related behaviors as well as reduce negative mental health outcomes.<sup>13-15</sup>

National organizations advise that psychosocial counseling be given to families at diagnosis as they are aware that a diagnosis of children's cancer creates distress.<sup>16</sup> Sadly, there is not much research that has been published on treatments that take place after a diagnosis and the realization that families' psychosocial needs are not being sufficiently met.<sup>17</sup> The nature of parental distress at diagnosis and the research supporting psychosocial therapies for relatives of newly diagnosed cancer patients are commonly seen.<sup>18</sup>

For children with cancer, parents are the primary source of social and emotional support, and they are also in charge of how successfully patients manage their illness. The degree of difficulty parents suffer after learning that their child has cancer significantly influences the child's psychological adjustment. The patient's QoL and the quality of care can both be impacted by the parents' decreasing health.<sup>6</sup> To guarantee treatment

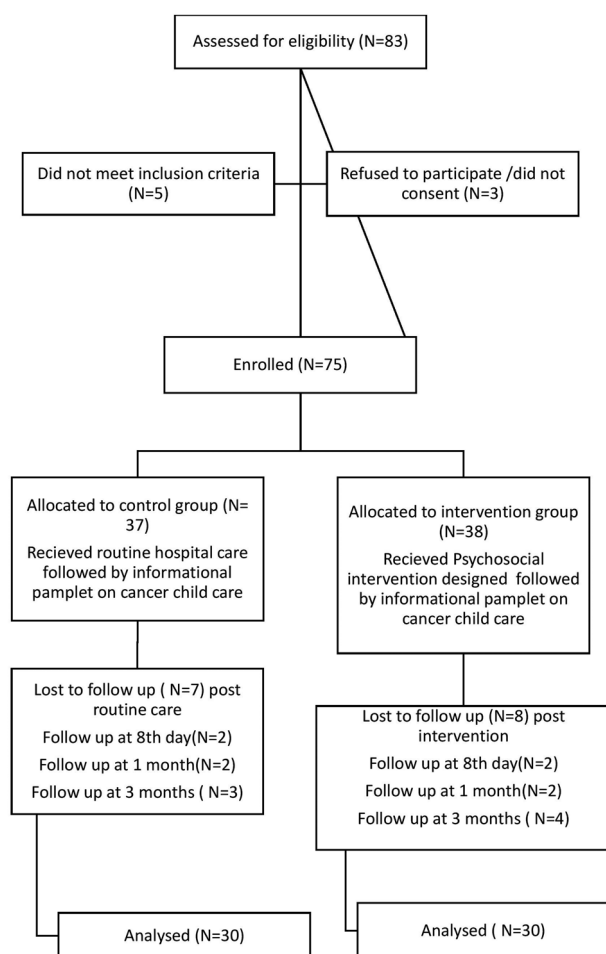
adherence and care continuity, parental engagement is crucial to the best management of cancer patients. Parents who are consistently exhausted and who have a lower QoL may delay providing the child with the necessary care, which may worsen the child's health. There are growing psychological therapies to lessen discomfort and enhance adjustment in parent child care (PCCs).<sup>1</sup> As a result, the parent's QoL must be taken into account for the benefit of both the patient's health and the parents themselves as unpaid primary caregivers.<sup>6</sup>

## Materials and Methods

Permission for the study was obtained from concerned authorities. Ethical clearance was obtained from the ethics committee (ethical clearance no. FMIEC/CCM/676/2021). The study was registered for Clinical Trials Registry-India (CTRI) (CTRI/2020/09/027774 on September 11, 2020). The subjects gave their consent after being fully informed. The survey was briefly introduced, the survey's voluntary and confidential nature was described, questions were answered, and surveys were distributed. The responders' anonymity and confidentiality were respected. A special code was supplied to each response. All of the data were password protected and only the researcher and other research employees involved in the project had access to them. Demographic pro forma, WHOQOL-BREF was collected from the mothers of children with cancer for 12 months. The questionnaires were finished by participants in ~15 minutes. The aggregate form of the combined data was reported. Data from the survey were coded before being entered into an electronic database for analysis. According to the objectives, the obtained data were recorded and then subjected to statistical analysis using descriptive statistics and inferential statistics. The study adhered to protocols that met the responsible committee on human experimentation's ethical criteria, as well as the 2017 Indian Council of Medical Research guidelines and the Helsinki recommendations. During data entry, missing data tools were discarded.

The quasi-intervention study design was undertaken. The sample consists of 60 mothers of children with cancer of all types. The purposive sampling technique was used to select the mothers who were assigned randomly to the intervention and control groups. Data were collected from the parent hospital. The sample size was determined using data from a previously published study<sup>19</sup> using the formula:

$$n = \frac{\sigma^2 (Z_{\beta} + Z_{\alpha})^2}{d^2}$$



**Fig. 1** Flowchart of subject recruitment for feasibility study.

where :

$n$  = sample size

$\sigma$  = standard deviation of difference

$d$  = Mean difference

$Z_{\beta}$  = corresponds to power (80% or 90% power)

$Z_{\alpha}$  = corresponds to level of significance (5% or 1%)

Thus, the obtained  $n = 86 + 10\%$  attrition

$= 96 (48 + 48)$

Since this was a feasibility study, a sample of  $30 + 30$  was taken (► Fig. 1).

Inclusion criteria for sample selection included all mothers of children diagnosed with cancer who were taking care of the child for at least the last 3 months, were admitted during the remission/induction phase of treatment, and were availing of inpatient, outpatient, and day-care services of the selected hospital. Mothers of children diagnosed with cancer who are intellectually and mentally challenged and who were undergoing palliative care were excluded.

## Tools

There were two instruments in the survey questionnaire. A demographic pro forma was the first tool, and a WHOQOL-BREF scale with 26 items was the second. Tool 1 had 18

demographic items which included age, sex, proximity to the hospital, family history of cancer, etc. Tool 2 WHOQOL-BREF scale with 26 items had no correct or wrong answer for QoL, a score of 1 was given for not at all and a score of 5 for extremely for 21 positively worded items, and a score of 5 was given for not at all and a score of 1 for extremely for 3 negatively worded items. Two items among the 26 items depicted overall QoL and were not included in domains. Grading of QoL was categorized into four domains namely physical, psychological, social, and environmental domains. By sending the tool to 11 experts, content validity was determined which included 2 pediatric oncologists, 2 psychologists, and 7 pediatric nursing experts. All validators accepted the tool and the obtained CVI was 100%. However, there were a few modifications in demographic variables which were modified as per suggestions. The translations of the tools from English to Kannada, Hindi, and back again were followed by further discussion with subject-matter experts. Language reliability was checked using Cronbach's  $\alpha$  and the internal consistency coefficients were 0.841 and 0.824, respectively. The tool was pretested in 15 mothers of children with cancer. There were no feasibility issues in administering the tool. Hence, we processed for the pilot study.

## Data Collection Method

The study was undertaken in two phases. Phase I involved qualitative data collection on the challenges of mothers of children with cancer using in-depth interview which led to the development of the psychosocial intervention. Phase II involved determining the effectiveness of the developed psychosocial intervention on the QoL of mothers of children with cancer. This article is on Phase II of the study; hence, the data collection involved in assessing the QoL among mothers of children with cancer was assessed using a WHOQOL-BREF scale. Mothers of children with cancer were randomly assigned to the intervention and control groups, and QoL was assessed using a WHOQOL-BREF scale. This followed the administration of psychosocial intervention to the mothers of the intervention group, whereas the mothers of the control group received routine hospital care. The psychosocial intervention was given for a duration of 2 hours as per the needs of the mothers in the hospital setting. Data on QoL for the control group were collected first and on completion, data from the intervention group were collected to prohibit the contamination. The psychosocial intervention was developed from Phase I of the study based on an in-depth interview which had four areas namely child care, psychological, financial, and spiritual areas. Psychosocial intervention included relaxation techniques, spiritual help, self-help/referral groups, referral services for financial concerns, and information on cancer child care which was provided using face-to-face, group, and individual sessions and PowerPoint presentations. The effectiveness of the psychosocial intervention on QoL among mothers of children with cancer was assessed by comparing preintervention QoL scores with postintervention QoL scores assessed on the 8th day, 1 month, and 3 months, and an informational pamphlet on cancer and its management was

given to the mothers of both the intervention and control groups. The mothers of children in the control group were given psychosocial intervention after the QoL assessment at 3 months to avail the benefit of the psychosocial intervention given to the intervention group. Collected data were subjected to analysis using SPSS 23.

## Results

### Baseline Characteristics of Mothers of Children with Cancer

The majority of mothers were older than 30 years with a mean  $\pm$  standard deviation (SD) of  $32.96 \pm 6.37$  and  $33.74 \pm 6.51$  in the intervention and control groups, and almost half of them had an education level of high school, belonged to a joint family, and had two children in both intervention and control groups, respectively. The proximity of the health care among the majority of mothers was reported to be less than 50 km with mean  $\pm$  SD of  $86.13 \pm 85.67$  and  $98.71 \pm 92.84$  km, with treatment cost less than Rs. 30,000 with mean  $\pm$  SD of  $29,100 \pm 21,660.95$  and  $30,741.94 \pm 24,516.62$  in intervention and control groups. Family monthly income was less than Rs. 29,000 with mean  $\pm$  SD of  $18,200 \pm 9,788.80$  and  $17,000 \pm 9,465.73$  and belonged to upper lower class, respectively, in both intervention and control groups ( $\rightarrow$  Table 1).

### Baseline Characteristics of Children with Cancer

The majority of children with cancer were younger than 10 years with mean  $\pm$  SD of  $5.92 \pm 4.71$  and  $7.51 \pm 5.44$  in the intervention and control groups, and more than 50% of children were male and diagnosed with acute lymphoblastic leukemia (ALL), respectively, in either of the groups. Most, more than 40% in the intervention and 50% in the control were in stage II and more than 90% received chemotherapy only in both the intervention and control groups. A majority (90%) of children also reported the time since diagnosis was made was as younger than 2 years with mean  $\pm$  SD of  $0.61 \pm 0.49$  and  $0.71 \pm 0.65$  in the intervention and control groups with no aggressive spread of disease in either of the group ( $\rightarrow$  Table 2).

### Effectiveness of Psychosocial Intervention on Quality of Life of Mothers of Children Diagnosed with Cancer

#### Domain-wise within-Group Two-Factor Repeated Measures ANOVA on the Effectiveness of Psychosocial Intervention on Quality of Life among Mothers of Children with Cancer

Domain-wise within-group two-factor ANOVA was done which shows the overall QoL scores over significantly high over the period in the intervention group when compared with the control group with the calculated value ( $p = 0.001^{**}$ ,  $p < 0.05$ ). Hence, the psychosocial intervention was effective

**Table 1** Baseline characteristics of mothers of children with cancer in terms of frequency and percentage:  $n = 30 + 30$

Variables	Intervention			Control			Chi-square	p-Value
	Frequency	%	Mean ± SD	Frequency	%	Mean ± SD		
Age (y)								
< 30	13	43.3	32.96 ± 6.37	11	36.7	33.74 ± 6.51	0.278	0.598
> 30	17	56.7		19	63.3			
Religion								
Hindu	19	63.3		19	63.3		–	0.845
Christian	1	3.3		2	6.7			
Muslim	10	33.3		9	30.0			
Occupation								
Unemployed	26	86.7		23	76.7		1.002	0.317
Skilled	4	13.3		7	23.3			
Educational qualification								
Middle school	5	16.7		4	13.3		–	0.845
High school	13	43.3		15	50.0			
Intermediate/diploma	3	10.0		5	16.7			
Graduate	5	16.7		3	10.0			
Professional degree	4	13.3		3	10.0			
Family type								
Nuclear family	7	23.3		9	30.0		1.393	0.498
Joint family	13	43.3		15	50.0			
Extended family	10	33.3		6	20.0			

**Table 1** (Continued)

Variables	Intervention			Control			Chi-square	p-Value
	Frequency	%	Mean $\pm$ SD	Frequency	%	Mean $\pm$ SD		
Place of residence								
Rural	16	53.3		14	46.7		0.267	0.606
Urban	14	46.7		16	53.3			
Proximity of the health care setting (km)								
< 50	12	40.0		10	33.3	98.71 $\pm$ 92.84	0.404	0.817
51–100	10	33.3	86.13 $\pm$ 85.67	10	33.3			
> 100	8	26.7		10	33.3			
Number of children								
One	9	30.0		8	26.7		0.802	0.670
Two	15	50.0		13	43.3			
Three	6	20.0		9	30.0			
Treatment expenditure (rupees per mo)								
$\leq 30,000$	21	70.0		20	66.7	30,741.94 $\pm$ 24,516.62	0.077	0.781
> 30,000	9	30.0	29,100 $\pm$ 21,660.95	10	33.3			
Information on cancer and its management								
Yes	14	46.7		16	53.3		0.267	0.606
No	16	53.3		14	46.7			
Source of information on cancer								
Media	6	20.0		6	20.0		0.356	0.837
Health personal	14	46.7		16	53.3			
Never received any information	10	33.3		8	26.7			
Challenges experienced due to the child cancer diagnosis								
Yes	27	90.0		25	83.3		0.577	0.448
No	3	10.0		5	16.7			
Family members diagnosed with cancer								
Yes	3	10.0		2	6.7		0.218	0.640
No	27	90.0		28	93.3			
Monthly income (according to Kuppuswamy scale)								
< 10,000	2	6.7		1	3.3	17,000 $\pm$ 9,465.73	–	0.795
10,000–29,000	22	73.3	18,200 $\pm$ 9,788.80	25	83.3			
29,000–49,000	5	16.7		3	10.0			
> 50,000	1	3.3		1	3.3			
Financial status								
(According to Kuppuswamy scale)							–	0.412
Upper middle class	5	16.7		3	10.0			
Lower middle class	9	30.0		6	20.0			
Upper lower class	16	53.3		21	70.0			

Abbreviation: SD, standard deviation.

**Table 2** Baseline characteristics of children with cancer in terms of frequency and percentage:  $n = 30 + 30$ 

Variables	Intervention			Control			Chi-square	p-Value
	Frequency	%	Mean ± SD	Frequency	%	Mean ± SD		
Age (y)								
≤10	23	76.7	5.92 ± 4.71	19	63.3	7.51 ± 5.44	–	0.71
≥11	7	23.3		11	36.7			
Diagnosis								
ALL	17	56.7		19	63.3			0.94
AML	3	10.0		2	6.7			
Neuroblastoma	3	10.0		2	6.7			
Hodgkin's	2	6.7		3	10.0			
Ewing's	3	10.0		3	10.0			
LCH	1	3.3		1	3.3			
CML	1	3.3		0	0			
Gender								
Male	16	53.3		17	56.7		0.067	0.795
Female	14	46.7		13	43.3			
Stage of disease								
Stage I	9	30.0		7	23.3			0.719
Stage II	12	40.0		15	50.0			
Stage III	5	16.7		6	20.0			
Stage IV	4	13.3		2	6.7			
Time duration from the time of diagnosis (y)								
0–2	29	96.7	0.61 ± 0.49	27	90.0	0.71 ± 0.65	1.071	0.301
> 2	1	3.3		3	10.0			
Modality of treatment								
Chemotherapy	27	90.0		29	96.7		1.071	0.301
Combined	3	10.0		1	3.3			
School dropout after the child's diagnosis								
Yes	5	16.7		6	20.0		0.275	0.871
No	7	23.3		8	26.7			
NA	18	60.0		16	53.3			
Aggressive spread								
Yes	6	20.0		3	10.0		1.176	0.278
No	24	80.0		27	90.0			

Abbreviations: ALL, acute lymphoblastic leukemia; AML, acute myeloid leukemia; CML, chronic myeloid leukemia; LCH, Langerhans cell histiocytosis; NA, not applicable; SD, standard deviation.

in improving QoL scores in psychological health domain ( $p = 0.02^*$ ,  $p < 0.05$ ), social relationship domain ( $p = 0.04^*$ ,  $p < 0.05$ ), and environmental health domain ( $p = 0.001^{**}$ ,  $p < 0.05$ ) (► **Table 3**).

#### Post Hoc Analysis of the Effectiveness of Psychosocial Intervention on Quality of Life among Mothers of Children with Cancer

Post hoc analysis using the Bonferroni's test which gives us within-group significant changes in QoL as measured by WHOQOL-BREF which found that psychosocial intervention among mothers of children with cancer was effective in the psychological health domain, social relationship domain, and

environmental health domain with a calculated value ( $p = 0.02^*$ ,  $p = 0.003^*$ ,  $p = 0.001^{**}$ ,  $p < 0.05$ ) assessed before intervention and 8th day of postintervention, before intervention and 1 month of postintervention, and before intervention and 3 months of postintervention, respectively (► **Table 4**).

#### Two-Factor Repeated Measures ANOVA on the Effectiveness of Psychosocial Intervention on Overall Quality of Life (Q1 and Q2) among Mothers of Children with Cancer

Overall QoL as measured by WHOQOL-BREF showed that psychosocial intervention among mothers of children with cancer was effective in Q1 and Q2 with a calculated value

**Table 3** Domain-wise descriptive of within-group and between-group two-factor repeated measures ANOVA on effectiveness of psychosocial intervention on quality of life among mothers of children with cancer:  $n = 30 + 30$ 

Parameter	Group	Observation				F-value	df	p-Value	Partial eta square
		Before	8th d	1 mo	3 mo				
Physical health domain	Intervention	22.43 $\pm$ 3.90	23.67 $\pm$ 1.40	23.33 $\pm$ 1.61	23.33 $\pm$ 1.49	1.530	3 and 174	0.208	0.03
	Control	21.37 $\pm$ 3.35	21.37 $\pm$ 3.35	21.37 $\pm$ 3.35	21.37 $\pm$ 3.35	7.943	1 and 58	0.208	0.12
Psychological health domain	Intervention	18.03 $\pm$ 2.68	22.10 $\pm$ 1.32	21.80 $\pm$ 1.54	22.10 $\pm$ 1.61	35.227	3 and 174	0.02 <sup>a</sup>	0.39
	Control	18.33 $\pm$ 2.80	18.33 $\pm$ 2.80	18.33 $\pm$ 2.80	18.33 $\pm$ 2.80	24.488	1 and 58	0.02 <sup>a</sup>	0.30
Social relationship domain	Intervention	9.37 $\pm$ 1.90	11.77 $\pm$ 1.04	11.77 $\pm$ 1.07	11.80 $\pm$ 0.96	24.100	3 and 174	0.04 <sup>a</sup>	0.29
	Control	9.33 $\pm$ 2.80	9.33 $\pm$ 2.80	9.33 $\pm$ 2.80	9.33 $\pm$ 2.80	12.480	1 and 58	0.04 <sup>a</sup>	0.18
Environmental health domain	Intervention	24.37 $\pm$ 4.33	30.90 $\pm$ 1.97	31.47 $\pm$ 1.50	30.53 $\pm$ 1.74	46.156	3 and 174	0.001 <sup>b</sup>	0.44
	Control	25.17 $\pm$ 3.72	25.17 $\pm$ 3.72	25.17 $\pm$ 3.72	25.17 $\pm$ 3.72	33.574	1 and 58	0.001 <sup>b</sup>	0.37
Total QoL	Intervention	74.20 $\pm$ 8.01	88.43 $\pm$ 2.79	88.37 $\pm$ 3.17	87.77 $\pm$ 2.80	65.111	3 and 174	0.001 <sup>b</sup>	0.53
	Control	74.20 $\pm$ 9.47	74.20 $\pm$ 9.47	74.20 $\pm$ 9.47	74.20 $\pm$ 9.47	34.663	1 and 58	0.001 <sup>b</sup>	0.37
Two-factor repeated measures ANOVA									
Parameter	Source	F	df		p-Value		Partial eta squared		
Physical health domain	Within group	1.530	3 and 174		0.208		0.026		
	Between group	7.943	1 and 58		0.208		0.120		
Psychological health domain	Within group	35.227	3 and 174		0.001 <sup>b</sup>		0.378		
	Between group	24.488	1 and 58		0.001 <sup>b</sup>		0.297		
Social relationship domain	Within group	24.100	3 and 174		0.002 <sup>b</sup>		0.294		
	Between group	12.480	1 and 58		0.002 <sup>b</sup>		0.177		
Environmental health domain	Within group	46.156	3 and 174		0.001 <sup>b</sup>		0.443		
	Between group	33.574	1 and 58		0.001 <sup>b</sup>		0.367		
Total QoL	Within group	65.111	3 and 174		0.002 <sup>b</sup>		0.529		
	Between group	34.663	1 and 58		0.002 <sup>b</sup>		0.374		

Abbreviations: ANOVA, analysis of variance; QoL, quality of life.

<sup>a</sup> $p < 0.05$ —significant.<sup>b</sup>Highly significant.



**Table 4** Post hoc analysis effectiveness of psychosocial intervention on quality of life among mothers of children with cancer:  $n = 30 + 30$ 

Parameter	Observation	Group	Mean difference	Standard deviation of difference	Change (%)	p-Value	Bonferroni p-value
Physical health domain	Before–8th d	Intervention	–1.23	4.38	5.50	0.402	0.129
		Control	0.00	0.00	0.00	1.000	
	Before–1 mo	Intervention	–0.90	3.84	4.01	0.630	0.205
		Control	0.00	0.00	0.00	1.000	
	Before–3 mo	Intervention	–0.90	4.31	4.01	0.786	0.257
		Control	0.00	0.00	0.00	1.000	
Psychological health domain	Before–8th d	Intervention	–4.07	2.95	22.55	0.000	0.000 <sup>a</sup>
		Control	0.00	0.00	0.00	1.000	
	Before–1 mo	Intervention	–3.77	3.17	20.89	0.000	0.02 <sup>b</sup>
		Control	0.00	0.00	0.00	1.000	
	Before–3 mo	Intervention	–4.07	3.48	22.55	0.000	0.02 <sup>b</sup>
		Control	0.00	0.00	0.00	1.000	
Social relationship domain	Before–8th d	Intervention	–2.40	2.18	25.62	0.000	0.000 <sup>a</sup>
		Control	0.00	0.00	0.00	1.000	
	Before–1 mo	Intervention	–2.40	2.21	25.62	0.000	0.03 <sup>b</sup>
		Control	0.00	0.00	0.00	1.000	
	Before–3 mo	Intervention	–2.43	2.22	25.98	0.000	0.03 <sup>b</sup>
		Control	0.00	0.00	0.00	1.000	
Environmental health domain	Before–8th d	Intervention	–6.53	4.83	26.81	0.000	0.001 <sup>a</sup>
		Control	0.00	0.00	0.00	1.000	
	Before–1 mo	Intervention	–7.10	4.85	29.14	0.000	0.001 <sup>a</sup>
		Control	0.00	0.00	0.00	1.000	
	Before–3 mo	Intervention	–6.17	4.84	25.31	0.000	0.001 <sup>a</sup>
		Control	0.00	0.00	0.00	1.000	
Total QoL	Before–8th d	Intervention	–14.23	8.61	19.18	0.000	0.001 <sup>a</sup>
		Control	0.00	0.00	0.00	1.000	
	Before–1 mo	Intervention	–14.17	9.20	19.09	0.000	0.02 <sup>b</sup>
		Control	0.00	0.00	0.00	1.000	
	Before–3 mo	Intervention	–13.57	8.72	18.28	0.000	0.02 <sup>b</sup>
		Control	0.00	0.00	0.00	1.000	

Abbreviation: QoL, quality of life.

( $p = 0.001^{**}$ ,  $p < 0.05$ ) assessed before intervention and 8th day of postintervention, before intervention and 1 month of postintervention, and before intervention and 3 months of postintervention, respectively.

#### Post Hoc Analysis on the Effectiveness of Psychosocial Intervention on Overall Quality of Life (Q1 and Q2) among Mothers of Children with Cancer

Post hoc analysis using the Bonferroni's test which gives us within the group and between group significant changes in QoL as measured by WHOQOL-BREF for Q1 and Q2 areas found that psychosocial intervention among mothers of

children with cancer was effective in Q1 and Q2 with a calculated value ( $p = 0.03^{*}$ ,  $p < 0.05$ ) assessed before intervention and 8th day of postintervention, before intervention and 1 month of postintervention, and before intervention and 3 months of postintervention, respectively.

#### Association between the Quality of Life among Mothers of Children with Cancer and Selected Baseline Variables

Multivariate ANOVA was used to find an association between QoL of mothers of children with cancer and selected baseline variables which revealed that there was a significant



association found between the physical health domain and information on cancer ( $p=0.01^*$ ), psychological health domain and financial status ( $p=0.03^*$ ), social relationship domain and cost of treatment ( $p=0.04^*$ ), Q1 and place of residence ( $p=0.004^{**}$ ), Q2 and place of residence ( $p=0.02^*$ ), and Q2 and financial status ( $p=0.03^*$ ).

### Association between the Quality of Life among Mothers of Children with Cancer and Selected Baseline Variables of the Child

Multivariate ANOVA was used to find an association between the QoL of mothers of children with cancer and selected child baseline variables. The table reveals that there was a significant association found between the physical health domain and diagnosis of a child ( $p=0.04^*$ ), psychological health domain and diagnosis of a child ( $p=0.04^*$ ), social relationship domain and school dropout ( $p=0.01^*$ ), and total QoL and school dropout ( $p=0.04^*$ ).

## Discussion

Our study found that the majority of children with cancer were younger than 10 years, male, and diagnosed with ALL. The majority of children also reported the time since diagnosis was made less than 2 years with no aggressive spread of disease in both the intervention and control groups. The majority of mothers were older than 30 years with their education level being high school, belonging to a joint family, and having two children in both groups. The proximity of the health care among a majority of mothers was reported to be less than 50 km, with treatment cost less than Rs. 30,000, with family income less than Rs. 29,000 and belonged to upper lower class, respectively, in both groups which were similar to findings by Rosenberg et al found that the participants in all three groups were married mothers with a median age of 35 to 38 (31–44) years and at least some college degree. Leukemia or lymphoma was the most common diagnosis in all three groups of children with cancer, who had a median (interquartile range) age of 5 to 8 (3–14) years. Slightly more than half of the children were male.<sup>12,20,21</sup>

Our findings were also supported by study findings of Robinson et al who reported that child's age was  $12.02 \pm 2.51$ , mother's age was  $38.59 \pm 7.31$ , mother's education was  $13.32 \pm 2.22$ , and father's education was  $13.27 \pm 3.22$  and Sahler et al who found that the mother's age was (mean  $\pm$  SD)  $36.3 \pm 8.1$  years. The child's age was (mean  $\pm$  SD)  $8.2 \pm 5.7$  years; 50.6% of children were male with 50% diagnosed with leukemia, 13% with solid tumors, and 10.8% with brain tumors.<sup>1,9</sup> Study findings of Rosenberg et al and Rosenberg et al revealed that participant mean age was  $16.2 \pm 2.8$  years, 58% female, duration of disease  $2.3 \pm 3.8$  years, and 40% were diagnosed with acute leukemia; 21% of parent's age was less than 38 years, 86% were married or living with a partner of which 31% had high school education, and 14% had an annual income of  $<\$25,000$ .<sup>2,20</sup> Results indicated that the length of a child's illness was connected to the eventual level of parental distress; parents of children

with cancer who had cancer for less than 6 months or more than 18 months had less success adjusting to their child's disease. Predictive grieving was inversely connected to aberrant grief responses, and prior loss was linked to worse outcomes.<sup>3</sup>

In the present study, a significant difference was noticed in the impact of psychosocial intervention on the overall QoL scores significantly high over the period in the intervention group when compared with the control group with a calculated value ( $p=0.001^{**}$ ,  $p<0.05$ ). Psychosocial intervention was effective in improving QoL scores in psychological health domain ( $p=0.02^*$ ,  $p<0.05$ ), social relationship domain ( $p=0.04^*$ ,  $p<0.05$ ), and environmental health domain ( $p=0.001^{**}$ ,  $p<0.05$ ). Similar findings were reported with high psychological distress (odds ratio [OR]: 3.71, 95% confidence interval [CI]: 1.17, 11.72), frequent sleep issues (OR: 5.19, 95% CI: 1.74, 15.45), and lower health satisfaction all associated with parents who had "low resilience resources" (OR: 5.71, 95% CI: 2.05, 15.92). These parents also stated that they found it more difficult to communicate their wishes and concerns to their medical staff (OR: 3.08, 95% CI: 1.12, 8.49 and OR: 4.00, 95% CI: 1.43, 11.18, respectively).<sup>12</sup> This was also supported by a systematic review by Rosenberg et al reported that high rates of anxiety, depression, protracted grieving, poor psychological well-being, poor physical health, and low QoL are experienced by parents of children who pass away from cancer. Additionally, parents were said to be at higher risk for poor life quality and low psychological well-being (risk ratio [RR]: 1.4; 95% CI: 1.2–1.7) (RR 1.3, 95% CI: 1.1–1.5) and findings of Rosenberg et al which reported that both the patients' and the parents' high regard for the Promoting Resilience in Stress Management (PRISM) intervention. Qualitative feedback advised that the PRISM or comparable interventions be created to promote coping and adjustment. Improved benefit finding and hope were linked to PRISM, with moderate to large impact sizes: hope: +3.6 points; 95% CI: 0.7, 6.4;  $d=0.6$ ;  $p=0.01.18$  and benefit finding: +3.1 points; 95% CI: 0.0, 6.2;  $d=0.4$ ;  $p=0.05$ .<sup>3,20,21</sup> Kearney et al revealed that the QoL for parents, aspects of their mental and physical health, how their family functions, and marital difficulties are all negatively impacted by parental distress. Long-term psychosocial outcomes are predicted by parental psychosocial functioning 6 months after diagnosis.<sup>5</sup> Sahler et al's study found that only the (PSST) Problem solving skills training intervention group showed a substantial improvement in problem solving at time 2 (T2), which was to be expected since these skills were particularly taught in PSST. Additionally, the PSST group at T2 had much better problem-solving abilities. Interestingly, mothers in the PSST group had improved even after the treatment ended (T2), resulting in significant between-group differences at the 3-month follow-up (T3).<sup>9</sup> On the contrary, a randomized controlled trial conducted by Stehl et al found that based on independent *t*-tests, neither main nor secondary caregivers' (STAI) State-Trait Anxiety Inventory scores at T1 showed any differences between the groups. However, on average, for both primary and secondary carers, both groups demonstrated a substantial decline in state anxiety from T1

to T2 (all  $p$ -values 0.05). A nonsignificant effect was also revealed by the combined analysis using a linear mixed model ( $p=0.22$ ; the difference between (SCCIP-ND) Surviving Cancer Competently Intervention Program-Newly Diagnosed and (TAU) standard psychosocial care/treatment as usual was 5.30 points, 95% CI: 3.34–14.17).<sup>8</sup>

In the present study with multivariate ANOVA, we found an association between QoL of mothers of children with cancer with physical health domain and information on cancer ( $p=0.01$ ), psychological health domain and financial status ( $p=0.03$ ), social relationship domain and cost of treatment ( $p=0.04$ ), Q1 and place of residence ( $p=0.004^{**}$ ) and Q2 and place of residence ( $p=0.02$ ), and Q2 and financial status ( $p=0.03$ ). However, study by Kim and Knight and a systematic review by Rosenberg et al found that only among spouses who provided care, did openness to experience have a direct positive correlation with life satisfaction ( $B=0.50$ , standard error [SE] = 0.22, 95% CI = 0.06, 0.93 and among parents who provide care, emotion control was directly correlated with life satisfaction ( $B=0.14$ , SE = 0.07, 95% CI = 0.002, 0.27). They also discovered that the severity of the parents' posttraumatic stress disorder was positively connected with avoiding disease- and treatment-related stimuli around the time of their child's diagnosis ( $r=0.52$ ,  $p=0.001$ ) and early in therapy ( $r=0.36$ – $0.47$ ,  $p=0.05$ ).<sup>3,15</sup> Robinson et al reported that Pearson's correlations showed that mothers' distress ( $r=14.43$ ,  $p=0.001$ ) and mothers' socioeconomic factors ( $r=14.26$ ,  $p=0.05$ ), such as lower household income, lesser education, and unemployment, as well as a pediatric disease factors such as relapse and severity of treatment, as well as a child's poor physical symptoms or functional impairment, were significantly correlated with fathers' and mothers' reports of internalizing symptoms in children. According to several studies, parental caregiving stress and load as well as poorer adjustment are all related to earlier traumatic life events and parent mental therapy.<sup>1</sup> On the contrary, no demographic factors such as caregiver sex, age, income, education, religiousness, child sex, age, cancer kind, or time since the end of therapy/death were linked to resilience resources.<sup>12</sup>

Our enrollment and the successful assessment completion rate were 79% for mothers of children with cancer in the intervention group and 81% for mothers of children with cancer in the control group. This may be due to the prolonged period of 3 months to complete the follow-up. However, our results reflected the difficulty in retaining the participants which is one of the limitations of the study. Another limitation is the restriction of mothers only in the selected hospitals. Wider coverage of mothers could have added varied information which can be undertaken in the main study. Three follow-ups were done on the 8th day, 1 month, and 3 months. A longer duration of follow-up of 6 to 12 months could have given the trend pattern of QoL which is our third limitation. However, the benefit of longer duration also has to be balanced with the issues with the retention of participants. Self-reporting questionnaire was used to assess the QoL which carries the risk of participants over- and underreporting which is another limitation of our study. Despite the above limitations, we

are confident with our findings due to (1) enrollment of an equal number of participants in the intervention and control groups. (2) On average 80% of mothers in both groups completed the second and third follow-ups. Thus, data obtained from either group reflect stability confirming the findings of the study. Our findings showed psychosocial intervention was effective on QoL of mothers of children with cancer in psychological, environmental, and social domains however did not have much impact on the physical domain in 3 months. However, our study supports a long-term follow-up of 6 months to identify the QoL over a while.

## Conclusion

In all QoL subdimensions, it was determined that the mothers of cancer patients had a mediocre to poor QoL. As a result, it is advised that nurses provide comprehensive nursing care for both families and children. A family support group should be created by health care facilities exclusively for family caregivers so that they can help one another and exchange information about how they have treated cancer.

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### Conflict of Interest

None declared.

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