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Long-term effects of a parenting program for advanced cancer: A randomized controlled trial

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Original Article

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Abstract

Objectives. This study examines effects over time of a telephone-delivered 5-session manualized parenting education program for child-rearing parents with advanced cancer. Primary outcomes were parents' depressed mood and anxiety, parenting skills, parenting self-efficacy, and child behavioral-emotional adjustment.

Methods. A total of 84 child-rearing parents diagnosed with advanced, non-curable cancer were recruited from community and comprehensive cancer centers and service providers serving cancer patients. After obtaining signed informed consent and baseline questionnaires, parents were randomized to an experimental treatment group or to an alternative treatment control group. Data (3, 6, and 9 months) were obtained after baseline. Linear Mixed Models were used to compare baseline with 6- and 9-month follow-ups. Outcomes at 3 months were reported earlier.

Results. Of the 84 parents initially randomized, 24 participants completed all data collection time periods. Mixed model analysis showed a significant change in parenting skills over all time periods that benefited the experimental group. There was also a significant improvement in parents' self-efficacy at 6 and 9 months, which benefited the control group.

Significance of results. This is the first known longitudinal study of child and parent-reported outcomes from a randomized controlled trial of a manualized cancer parenting program for parents with advanced cancer. All results should be viewed with caution given the small sample size and the loss of 71% of the participants from baseline to 9 months. Despite these limitations, Linear Mixed Models analysis showed clinically significant improvements in parenting skills over time compared to an alternative treatment control group.

Introduction

Children impacted by parents diagnosed with cancer will reach numbers over 300,000 in the year 2026, and approximately 20% of these parents will be diagnosed with advanced disease for which there is no known cure (ACS 2026). Few programs or services exist to assist families in dealing with advanced disease and its impact on dependent children. There is only one known intervention that has been tested for efficacy in helping parents with advanced cancer improve their skills and confidence in talking to their young children about their cancer: the Enhancing Connections-Palliative Care (EC-PC) program (Lewis et al. 2026). See Table 1 for a description of the 5 intervention sessions in the experimental intervention group. The comparison group, an alternative treatment control group, received a booklet followed by a phone call from a trained nurse educator highlighting key points in the booklet. The booklet, entitled "*Having Successful Conversations with Your Child,*" focused on ways the parent could talk with and support their child about the cancer; each recommendation or "tip" in the booklet was based on published studies. Outcomes at 3 months showed that parents randomized to a 5-session, telephone-delivered parenting program significantly improved in parenting skills compared to an alternative treatment control group (Lewis et al. 2026). Still unknown are the longer-term outcomes at 6- and 9-month follow-ups.

The purpose of the current study is to examine parents' behavioral-emotional adjustment outcomes, cancer-related parenting competency outcomes, and child behavioral-emotional adjustment outcomes of the experimental group compared to the control group at 6- and 9-month follow-ups in the EC-PC program.

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Table 1. Description of experimental intervention sessions

Session 1: Anchoring yourself to help your child: Helps the diagnosed parent view the child's experience with their parent's cancer as distinct from their parent's experience and adds to the parent's skills to self-regulate their own cancer-related emotions to prevent emotionally flooding the child.
Session 2: Adding to your listening skills: Assists the ill parent in developing targeted skills to deeply listen without judgment to their child's thoughts and feelings, distinguishing it from the parent's tendency to teach or be a problem-solver.
Session 3: Building on your listening skills: Builds on Session 2 and helps parents gain skills to elicit and help the child elaborate their concerns or feelings, even when the child is not forthcoming. It is one thing to engage a talkative child (Session 2); it is another to help a child who is not talkative.
Session 4: Being a detective of your child's coping: Helps the parent gain insights and not judge their child's ways of coping with the parent's cancer and includes exercises to help parents relinquish negative assumptions about their child's behavior. The session also helps parents gain ways to better support the child's coping with the child's cancer-related concerns.
Session 5. Celebrating your success: Focuses the parent's reflection on gains they made in participating in the program. Both self-monitoring and self-reflection are key elements to enhance the parent's parenting self-efficacy. By self-reflection, the final session helps the parent internalize a new view of the self as a skilled and confident parent, not just a parent with newly acquired skills.

Methods

Study design

The study was a 2-group, randomized controlled trial with 3-, 6-, and 9-month follow-ups. See details reported earlier (Lewis et al. 2026). Briefly, study participants were child-rearing parents diagnosed with advanced, non-curable cancer who had a co-parent or surrogate parent who lived with them, a child aged 5–17, spoke English among their languages, and had access to a telephone. Diagnosis was based on a TNM (Tumor, Nodes, Metastasis) Stage IV diagnosis for solid tumors, Stage III for Ovarian cancer, or 2 or more cycles of treatment failure with relapse for nonsolid tumors. After obtaining signed informed consent, baseline data were collected, after which the diagnosed parent was randomized to the experimental treatment or alternative treatment control group. Outcome data were collected at 3, 6, and 9 months post-baseline.

Study measures

Baseline demographic, diagnosis, and treatment data, collected at baseline, included type of cancer, time since initial diagnosis, time since diagnosis with advanced cancer, and specifics about medical, surgical, and treatment care.

All outcome measures and demographic data were self-reported; diagnosis and staging were self-reported and verified against physician reports. Eligibility was confirmed by screening prior to enrollment.

Depressed mood was measured by the Center for Epidemiologic Studies–Depression (CES-D) Scale (Radloff 1977; Lewis et al. 1989, 2008; Benazon and Coyne 2000). The CES-D is a self-reported 20-item questionnaire that measures the occurrence of recent depressive symptoms. Responses range from 0 to 3, with a total score ranging from 0 to 60. For each item, the respondent indicates how frequently that symptom had occurred in the past week. A higher score indicates a higher depressed mood. Previous studies by Radloff (1977) reported an internal consistency from 3 samples from the general population, which ranged from 0.84 to 0.85 (Radloff 1977; Coyne et al. 1987; Benazon and Coyne 2000; Given et al. 2004). Internal consistency reliability for the current study sample was 0.85.

Anxiety was measured using the state component of the Spielberger State-Trait Anxiety Scale (STAI) (Spielberger 1983; Spielberger and Rickman 1990; Spielberger et al. 1999). This is a 20-item self-reported questionnaire that measures how apprehensive, tense, nervous, or worried the participant is "right now." Responses range from 1 to 4, with a total anxiety score ranging from 20 to 80. A higher score indicates higher anxiety and tension in a participant. Internal consistency and reliability for the STAI scale was 0.90 for this study.

Parenting confidence was measured by the Cancer Self-efficacy (CASE) (Lewis et al. 2015, 2026). This scale measures the parent's confidence in his or her ability to talk with the child about any cancer-related concerns. The scale includes 3 subscales, Help Child (9 items), Deal and Manage (13 items), and Stay Calm (6 items). Responses ranged from 1 – "not at all confident" to 10 – "very confident." Higher scores denote higher self-efficacy. The Help Child subscale scores can range from 9 to 90 and are a measure of how confident the parent is in their ability to talk with their child about any cancer-related concerns and ways to manage any concerns. The Deal and Manage subscale scores can range from 13 to 130 and measure how confident the parent is in helping themselves and their family deal with the cancer. The Stay Calm subscale scores can range from 6 to 60 and measure the parent's confidence that they can stay calm during difficult interactions with their child about the parent's cancer. The internal consistency reliabilities for the 3 CASE subscales in this study sample were 0.95, 0.82, and 0.86, respectively.

Parenting skills were measured by the Parenting Skills Checklist (Lewis et al. 2015). The measure is a 10-item self-reported assessment of a parent's skills in assisting their child to disclose, discuss, and better manage the impact of the cancer on the child. The Parenting Skills measure was developed by the study team conducting this trial and has been tested in prior clinical trials (Lewis et al. 2015, 2017; Lewis et al. 2020). The items query the parent about specific cancer-related connecting and coping skills and are not just general parenting skills measures. Example items include "I draw out my child's concerns or questions about my cancer," "I work with my child to help my child specifically manage the child's stress related to my cancer," and "I focus on my child's response to my cancer on a regular basis." Response options range from 0 (Never) to 5 (All of the time), and the total score can range from 0 to 50. Higher scores denote greater skills. Internal consistency reliability for this study sample was 0.93.

Child behavioral-emotional adjustment was measured by the parent-reported measure of the Child Behavior Checklist (CBCL) (Achenbach and Edelbrock 1978; Achenbach and Rescorla 2001). The measure assesses a range of behavioral problems in children ages 6–18. Response options range from 0 (not true) to 2 (very true); higher scores reflect more problems. Two subscales were assessed for the current study: Internalizing and

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Externalizing Problems. Internalizing Problems is a 32-item subscale that measures a child's fearful, inhibited, and over-controlled behavior. Its internal consistency reliability was 0.90 for the study sample. Externalizing Problems is a 35-item subscale that measures a child's aggressive, anti-social, and under-controlled behavior; its internal consistency reliability was 0.94 for the study sample.

Physical and psychological symptom burden and distress were assessed by parent self-report using the Condensed Memorial Symptom Assessment Scale (CMSAS) (Chang et al. 2004). This is a 14-item self-report scale that includes 2 subscales that measure what physical and psychological symptoms a patient has experienced over the past 7 days. Higher values on these 2 subscales indicate higher symptoms. For this study, the internal consistency reliabilities were 0.82 and 0.72, respectively, for the 2 subscales.

Study aims

The purpose of the current study is to compare parents' behavioral-emotional adjustment outcomes, cancer-related parenting competency outcomes, and child behavioral-emotional adjustment outcomes of the experimental group compared to the control group at 6- and 9-month post-baseline.

Study sample

Of the initial 403 ill parents who were screened for eligibility, 306 were excluded, including 95 who were not eligible, 122 who declined to participate, 74 who could not be reached for screening, and 14 who agreed to participate but were unable to be reached to complete consent. Of the remaining 98 who were enrolled, 84 parents were randomized. See Figure 1 for participant flow sheet.

Forty-two parents were randomized to the experimental group, and 42 were randomized to the alternative control group. Fifty-six of the initial 84 parents (26 in the experimental group, 30 in the alternative control group) completed 3-month follow-up data. Sixteen patients died or became too ill to continue the study; 5 were lost to follow-up, 6 withdrew citing that they no longer needed or wanted the study, and 1 parent became ineligible to continue.

Of the 56 parents who completed 3-month outcome data, 35 (18 experimental and 17 control group) completed 6-month follow-up data. See Figure 1 for detailed reasons for patient attrition. There were 24 participants who completed 9-month follow-up data (12 experimental and 12 control group).

Description of study sample

Eighty-four parents were enrolled and randomized to this study. Parents averaged 46.89 ± 7.24 years of age, and 57 (67.86%) were female. Eighty (95.23%) of the dyads were married for an average of 16.35 ± 3.49 years. Children had an average age of 11.29 ± 3.42 years, and the majority (57.14%) were female.

The largest proportion of enrolled patients had a diagnosis of breast (28.57%), colorectal (23.81%), lung (10.71%), or brain cancer (15.48%). Patients had been diagnosed with advanced cancer for an average of 32.02 ± 36.61 months, and over 70% of the participants had undergone surgery for their cancer. Within the last 6 months, 46.67% received chemotherapy, 4.00% received radiation, and 49.33% received both types of therapy for their cancer.

The 35 participants who completed 6-month data collection were similar in the majority of demographic variables, for example, parents' age (mean 46.14 ± 6.51), number of females (65.71%), and age of child (11.14 ± 2.91). Participants who completed 9-month data collection were on average 45.92 ± 5.64 years old, 62.50% were females, and children were a mean of 11.29 ± 3.07 years old. See Tables 2 and 3 for demographic, diagnosis, and treatment data at baseline and for those who completed 6- and 9-month follow-ups.

Results

Data analysis methods

Prior to testing efficacy, outcome measures were inspected for sampling distributions, outliers, and covariates. All outcome measures were normally distributed; no data transformation was needed.

Pretreatment equivalence between the randomization groups was examined on demographic and diagnostic measures using independent *t*-tests and chi-squared analysis. No significant differences were found between the 2 randomization groups on any of the demographic or diagnostic variables.

Randomization groups were additionally tested to assess comparability on outcome measures at baseline for participants who completed 3-month assessments. The 2 groups were comparable with 1 exception. Participants in the control group had significantly higher scores on the psychological symptoms score on the Condensed Memorial Symptoms Assessment scale compared to participants in the experimental group for those who completed 3-month assessments ($p = 0.007$, 2-tailed independent *t*-test). Additionally, baseline measures were analyzed by comparing randomization groups for participants who completed 6- and 9-month follow-up dates. As with the full sample size, the 2 groups were comparable with the exception of the Condensed Memorial Symptoms Assessment scale psychological symptoms score, which was significantly higher for participants in the alternative treatment control group. The psychological symptoms score was used as a covariate in all subsequent analyses.

Linear Mixed Models with intent-to-treat analyses were used to determine changes in outcome measures over time. Planned comparisons were made between baseline and 6 months and between baseline and 9 months follow-up.

Results

Overall results: There were significant improvements for the experimental group compared to the control group at 6- and 9-month follow-ups for all time points on parenting skills. There were significant improvements in the control group compared to the experimental group at 6- and 9-month follow-ups on the parents' self-confidence in helping their family manage the cancer. See Table 4.

Depressed mood

There were no significant differences in parents' depressed mood between the experimental and control groups at any time point. The pattern was for parents in the control group to show a steady decline in depressed mood over all time periods, while parents in the experimental group declined initially but then increased at 6 months, then decreased again at 9 months. See Figure 2.

Anxiety

There were no significant differences in parent anxiety between the experimental and control groups at any time point. Parents in both groups declined in anxiety at 3 months and showed increased

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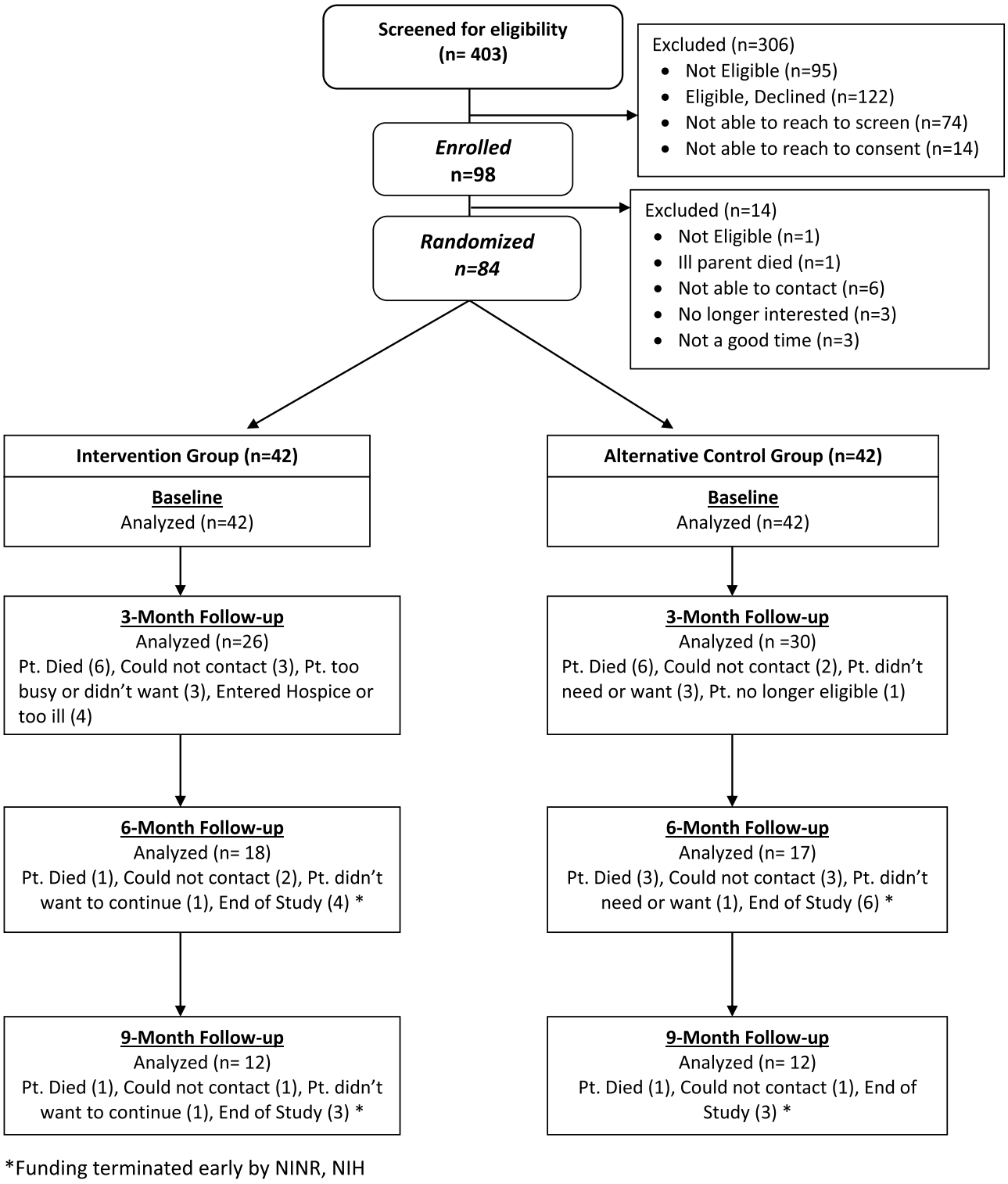


Figure 1. Flowchart of study participants.

anxiety at 6 months, which then declined slightly at 9 months. See Figure 3.

Parenting skills

Outcomes at 3 months showed a statistically significant improvement in parenting skills in the experimental group compared to the alternative treatment control group (Lewis et al. 2026). These significant differences in parenting skills were sustained at 6- and 9-month follow-ups. Effect sizes were clinically significant at all assessment periods. Effect sizes at 6 and 9 months were larger in magnitude than those at 3 months. Specifically, the d-score at 6 months was 0.89 ($p = 0.05$) and was 0.92 ($p = 0.05$) at

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Table 2. Study participants characteristics

Demographic information	Study participants at baseline $N = 84$	Study participants at 6 months $N = 35$	Study participants at 9 months $N = 24$
Age – mean ± SD (median)	46.89 ± 7.24 (47.00)	46.14 ± 6.51 (47.00)	45.92 ± 5.64 (46.50)
Gender identity			
Males	26 (30.95%)	11 (31.43%)	9 (37.50%)
Females	57 (67.86%)	23 (65.71%)	15 (62.50%)
Non-binary	1 (1.19%)	1 (2.86%)	
Highest education completed			
Some high school or high school graduate	6 (7.14%)	1 (2.86%)	1 (4.17%)
Some college or college graduate	41 (48.81%)	21 (60.00%)	15 (62.50%)
Masters/doctorate degree	37 (44.05%)	13 (37.14%)	8 (33.33%)
Parent ethnicity Hispanic	8 (9.52%)	4 (11.43%)	2 (8.33%)
Parent White	65 (77.38%)	29 (82.86%)	18 (75.00%)
Marital status – married	80 (95.23%)	34 (97.14%)	24 (100.00%)
Years in relationship with non-ill partner – mean ± SD (median)	16.35 ± 3.49 (16.50)	17.28 ± 5.03 (16.00)	18.32 ± 5.48 (17.50)
Parent employment			
Full or part-time	31 (36.90%)	14 (40.00%)	9 (37.50%)
Medical Leave of absence	18 (21.43%)	9 (25.71%)	8 (33.33%)
Staying at home full time/retired/not working	35 (41.67%)	12 (34.29%)	7 (29.17%)
Income			
<$50,000	9 (10.71%)	3 (8.57%)	1 (4.17%)
$50,000–$150,000	26 (30.95%)	7 (20.00%)	4 (16.67%)
>$150,000	43 (51.19%)	21 (60.00%)	17 (70.83%)
Don't know/prefer not to answer	6 (7.14%)	4 (11.43%)	2 (8.33%)
Child age – mean ± SD (median)	11.29 ± 3.42 (11.00)	11.14 ± 2.91 (11.00)	11.29 ± 3.07 (11.00)
Child gender identity			
Male	35 (41.67%)	18 (51.43%)	12 (50.00%)
Female	48 (57.14%)	17 (48.57%)	12 (50.00%)
Non-binary	1 (1.19%)		
Number of children in house			
1–2	66 (78.57%)	29 (82.86%)	19 (79.186%)
3 or more	18 (21.43%)	6 (17.14%)	5 (20.83%)

9 months, both of which were larger in magnitude than the *d*-score at 3 months. See Table 5. The pattern in the experimental group was for parenting skills to increase at 3 months, then decrease at 6 months, but then increase at 9 months. Scores in the control group increased at 3 months but steadily decreased at 6 and 9 months. See Figure 4 and Table 4.

Parenting self-efficacy

In contrast to results on the measure of parenting skills, improvements in parents' self-confidence benefited the alternative treatment control group. More specifically, there were significant improvements in scores on the Deal and Manage subscale of the CASE at 6 and 9 months in the control group. The pattern was for the control group to improve continually at each assessment period, while the experimental group improved at 3 months but then declined at the 6-month follow-up. There was improvement in the experimental group at 9 months, but not to the level of improvement observed at 3 months. See Figure 6. The effect size at 3 months for this subscale was only $d = 0.09$. Scores at 6 and 9 months were statistically significant, with a moderate effect size at 6 months ($d = 0.48$) and a small effect size at 9 months ($d = 0.32$). Analysis of the other 2 parenting self-efficacy subscales, the Help Child subscale and the Stay Calm subscale, showed no significant changes over time. The pattern for the Stay Calm subscale mirrored that of the Deal and Manage subscale. See Figures 5 and 7.

Child behavioral and emotional (CBCL) adjustment

There were no significant changes over time between the experimental and control groups on Internalizing or Externalizing

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Table 3. Description of diagnosis, type of cancer, and medical treatment

Demographic information	Study participants at baseline $N = 84$	Study participants at 6 months $N = 35$	Study participants at 9 months $N = 24$
Months since initial cancer diagnosis – mean ± SD (median)	51.03 ± 54.98 (37.58)	46.40 ± 59.40 (23.03)	44.30 ± 66.22 (18.87)
Length of time modal	2.00 months	1.84 months	1.84 months
Months since adv cancer diagnosis – mean ± SD (median)	32.02 ± 36.61 (15.85)	27.36 ± 29.46 (15.28)	23.38 ± 24.59 (13.11)
Length of time modal	2.37 months	0.46 months	0.46 months
Type of cancer			
Breast	24 (28.57%)	10 (28.57 %)	7 (29.17%)
Colorectal	20 (23.81%)	11 (31.43%)	8 (33.33%)
Lung	9 (10.71%)	6 (17.14%)	4 (16.67%)
Stomach	2 (2.38%)	1 (2.86%)	1 (4.17%)
Brain	13 (15.48%)	3 (8.57%)	2 (8.33%)
Esophageal	2 (2.38%)	1 (2.86%)	1 (4.17%)
Melanoma	1 (1.19%)		
Lymphoma	1 (1.19%)		
Uterine	1 (1.19%)		
Bone	1 (1.19%)	1 (2.86%)	
Pancreatic	1 (1.19%)		
Appendix	1 (1.19%)	1 (2.86%)	1 (4.17%)
Ocular melanoma	1 (1.19%)		
Thymus carcinoma	1 (1.19%)		
RET genetic mutation	1 (1.19%)	1 (2.86%)	
Paraganglioma	1 (1.19%)		
Sarcoma	1 (1.19%)		
Neuroendocrine carcinoma	1 (1.19%)		
Chondrosarcoma	1 (1.19%)		
Bile duct cancer	1 (1.19%)		
Surgery for cancer	59 (70.24%)	25 (71.43%)	17(70.83%)
Received chemo or radiation in last 6 months	75 (88.10%)	31 (88.57%)	21 (87.50%)
Radiation	3 (4.00%)	2 (6.45%)	2 (9.52%)
Chemotherapy	35 (46.67 %)	16 (51.61%)	12 (57.14%)
Both	37 (49.33%)	13 (41.94%)	7 (33.33%)

Problems. Although Child Behavioral and Emotional adjustment improved slightly at 3 months on both Internalizing and Externalizing Problems for both randomization groups, the scores stabilized at 6 and 9 months. See Figures 8 and 9. Recall that lower scores on these measures denote better adjustment.

Discussion

A telephone-delivered manualized cancer parenting counseling program for child-rearing parents with advanced cancer significantly improved parenting skills at 3, 6, and 9 months. Results from the current study demonstrated that the early significant gains in skills at 3 months were not just significantly sustained at 6 and 9 months, but the differences between groups steadily increased. More specifically, parenting skills in the experimental group remained significantly higher than controls at all 3 assessment periods: 3, 6, and 9 months. The magnitude of the effect sizes at 6 and 9 months was even larger than the effect sizes achieved at 3 months. Once parents gained skills, they retained them.

Analysis over time revealed another result that benefited the control group. Parenting self-efficacy improved in the control group on the Deal and Manage subscale of the CASE. An inspection of items on that subscale raises a question which we are unable to answer. We do not know why self-efficacy improved on that subscale whose items read, "I am able to deal with the feelings of

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Table 4. Outcome measures over time by randomization group[a]

	Baseline				3 Months Post-baseline						6 Months Post-baseline						9 Months Post-baseline					
	Control		Experimental		Control		Experimental				Control		Experimental				Control		Experimental			
	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	d[b]	p-Value[b]	Mean	(SE)	Mean	(SE)	d[c]	p-Value[c]	Mean	(SE)	Mean	(SE)	d[d]	p-Value[d]
Depressed mood	15.86	1.06	17.41	1.05	14.96	1.48	15.07	1.57	0.28	0.502	14.24	2.19	17.07	2.15	0.04	0.695	10.92	1.94	17.67	1.96	0.14	0.098
Anxiety	37.93	1.36	36.77	1.35	36.55	1.92	36.39	2.02	0.06	0.686	36.68	2.70	38.94	2.67	0.44	0.376	33.41	2.48	36.13	2.50	0.54	0.314
Parenting skills	26.64	2.02	25.01	2.00	30.45	1.93	34.67	2.01	0.54	0.016	28.49	2.14	33.35	2.13	0.89	0.050	28.41	2.59	34.98	2.60	0.92	0.050
Parenting confidence (CASE)																						
Help Child	61.26	2.84	59.72	2.83	69.09	2.13	72.06	2.23	0.29	0.171	71.56	2.66	67.88	2.65	0.52	0.633	72.52	2.93	70.37	2.96	0.19	0.908
Deal and Manage	95.08	2.91	95.49	2.89	102.93	2.68	102.24	2.80	0.09	0.768	106.04	3.04	96.13	3.00	0.48	0.040	110.69	3.40	98.84	3.43	0.32	0.038
Stay Calm	48.90	1.48	47.99	1.47	52.60	1.21	51.00	1.28	0.16	0.715	53.41	1.55	48.72	1.53	0.60	0.149	53.23	1.48	49.10	1.51	0.36	0.250
CBCL																						
Internalizing	57.81	1.45	58.48	1.44	55.11	1.71	56.09	1.75	0.01	0.874	55.91	2.17	55.67	2.12	0.02	0.755	55.75	1.88	57.84	1.90	0.24	0.631
Externalizing	50.83	1.49	52.49	1.48	48.20	1.75	49.93	1.78	0.02	0.962	49.14	2.02	49.15	2.00	0.38	0.509	49.88	2.08	49.85	2.08	0.14	0.566

[a]Analysis controlled for differences between experimental and control groups on psychological symptoms at baseline.
[b]Cohen's d/p-value = Effect size and p-value for change from baseline to 3 months by randomization group.
[c]Cohen's d /p-value = Effect size and p-value for change from baseline to 6 months by randomization group.
[d]Cohen's d /p-value = Effect size and p-value for change from baseline to 9 months by randomization group.

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Table 5. Effect sizes for parenting skills for experimental and control groups at 6- and 9-month post-baseline

Randomization group		Parenting skills baseline	Parenting skills 3 months	Difference baseline to 3 months	Parenting skills baseline	Parenting skills 6 months	Difference baseline to 6 months	Parenting skills baseline	Parenting skills 9 months	Difference baseline to 9 months
Control group	Mean	27.17	31.01	3.85	28.00	29.76	1.76	27.00	28.67	1.67
	Std. deviation	13.00	11.48	9.85	12.68	12.09	5.68	11.73	12.12	8.95
	N	30	30	30	17	17	17	12	12	12
Experimental group	Mean	24.08	33.75	9.68	21.89	32.11	10.22	19.92	32.50	12.58
	Std. deviation	11.67	10.43	11.13	11.13	10.64	10.59	12.00	11.32	12.18
	N	26	26	26	18	18	18	12	12	12
Total	Mean	25.73	32.28	6.56	24.86	30.97	6.11	23.46	30.58	7.13
	Std. deviation	12.39	10.99	10.77	12.13	11.26	9.47	12.16	11.64	11.85
	N	56	56	56	35	35	35	24	24	24
Effect size				0.54			0.89			0.92

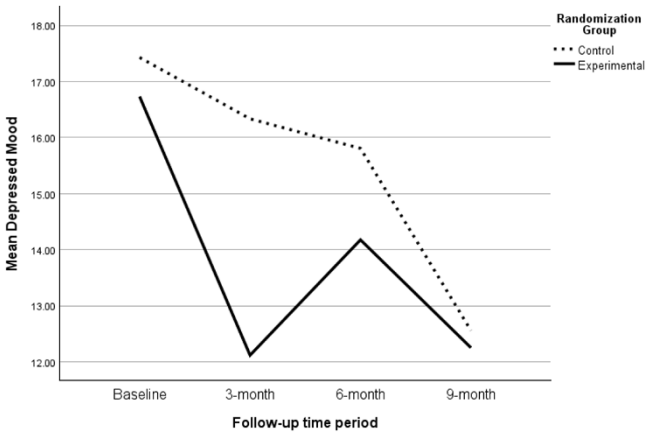


Figure 2. Parent depressed mood by randomization group at 3, 6, and 9 months.

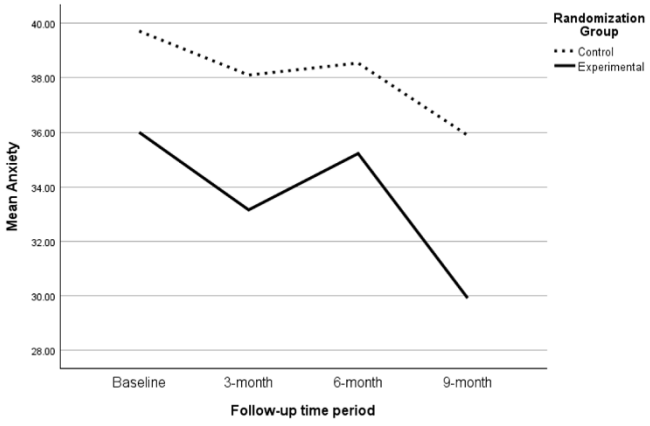


Figure 3. Parent anxiety by randomization group at 3, 6, and 9 months.

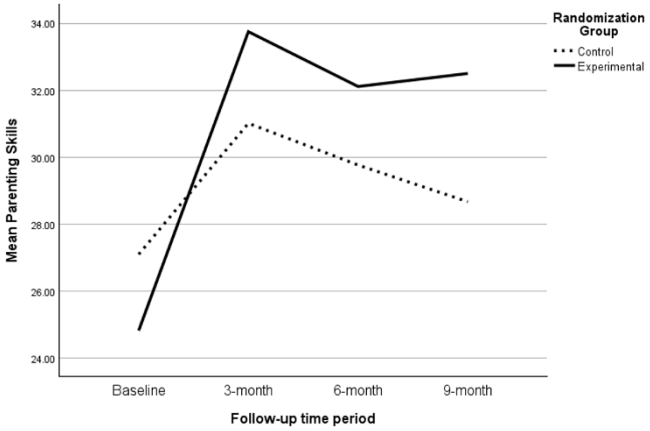


Figure 4. Parenting skills by randomization group at 3, 6, and 9 months.

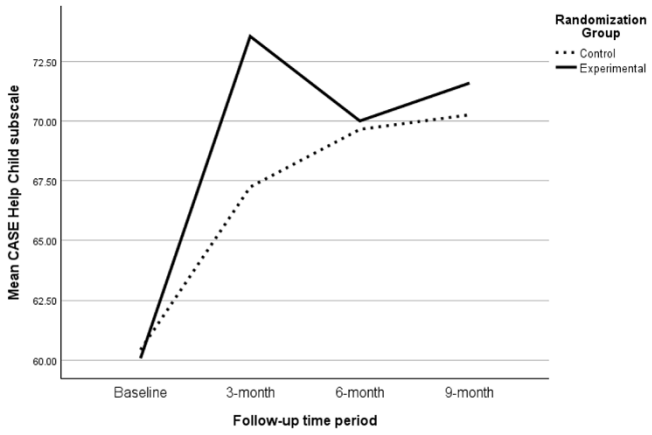


Figure 5. CASE – Help Child subscale by randomization group at 3, 6, and 9 months.

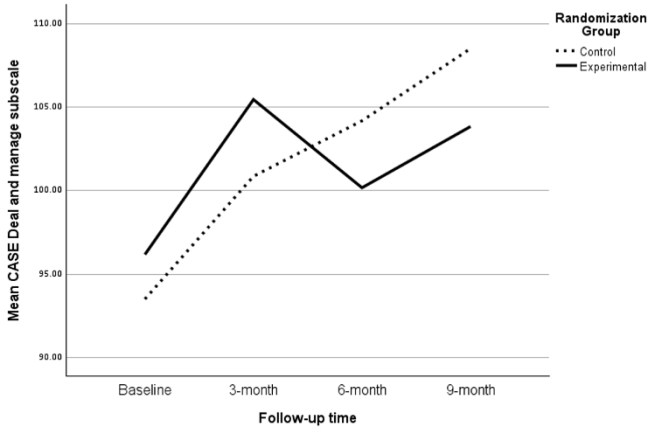


Figure 6. CASE – Deal and Manage subscale by randomization group at 3, 6, and 9 months.

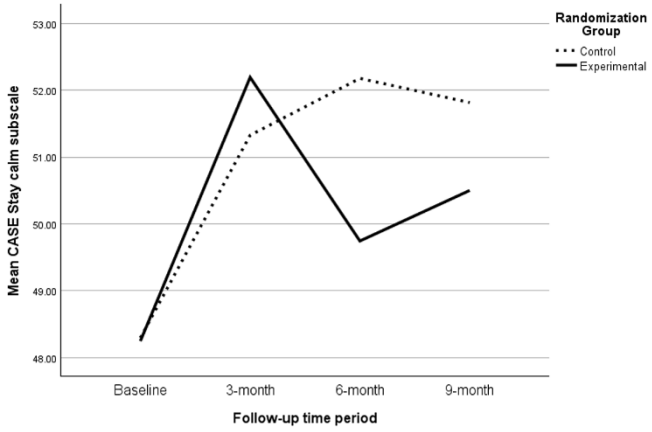


Figure 7. CASE – Stay Calm subscale by randomization group at 3, 6, and 9 months.

loss brought on by the cancer" and "I have ways to manage the uncertainty brought on by the cancer." The EC-PC program did not directly target those areas. We speculate that improvements in this subscale reflected a generalized diffusion of benefit but not an alternative treatment effect. Content of the subscale had nothing to do with the content in the alternative treatment control group booklet.

Attrition from the experimental and control groups was high. See Figure 1. A total of 25 study participants were lost to follow-up at 6 months in the control group and 24 in the experimental group; a total of 30 participants were lost at 9 months in the control group and 30 in the experimental group. Between 6 and 9 months of follow-up, 2 participants died because of illness-related reasons

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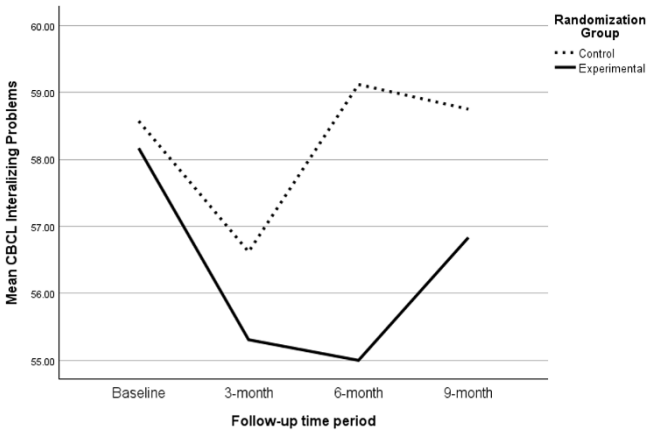


Figure 8. Child Behavioral Checklist – Internalizing Problems subscale by randomization group at 3, 6, and 9 months.

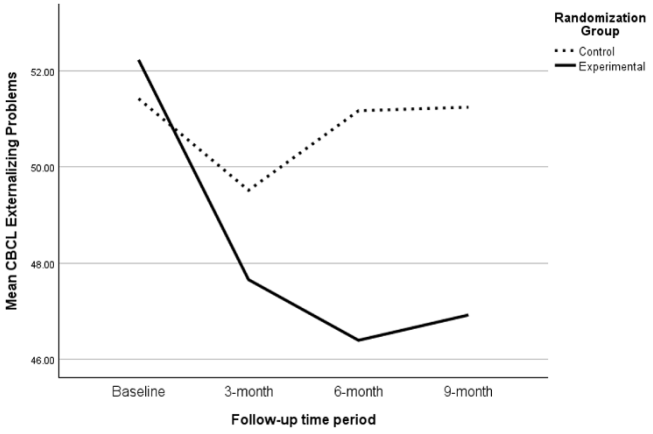


Figure 9. Child Behavioral Checklist – Externalizing Problems subscale by randomization group at 3, 6, and 9 months.

in the experimental group. Four participants died for the same reasons in the alternative control group. This high attrition due to death and illness-related causes at both the primary endpoint and end of study is high compared to studies of palliative care patients; Hui's team reported a 28% attrition for primary endpoint and 44% for end of study (Hui et al. 2013).

Estimates in the current study should be considered statistically biased. It is always possible that results in a future study with a different sample from this population would be different than those reported from the current study. We do not know the direction of that bias; one possibility is self-enhancement bias. However, the lack of improvement in parents' report of their child's Internalizing and Externalizing Problems in both the experimental and control groups does not support a self-enhancement bias. If such an enhancement bias existed, scores on Externalizing and Internalizing Problems would have improved in both groups. See Figures 8 and 9. Instead of a self-enhancement bias, we suggest that results at both 6 and 9 months are valid and come from highly motivated and accurate reporters who, despite their negative prognosis, were committed to being the best parent they could be (Zahlis et al. 2020). Less committed and motivated parents would not likely improve to the same extent as did parents in the current study.

Study limitations

Results reported in the current study should be viewed with caution. Outcomes are based on a small sample of parents on whom data were collected at 6 and 9 months. The magnitude of effect sizes (Cohen's *d*) for the outcomes should be viewed as preliminary estimates. Recall that effect sizes are calculated on raw data and are a function of sampling variability between occasions and sample size. We are optimistically cautious that the increased magnitude of statistically significant differences between baseline and 6 months and baseline and 9 months represents a true differential benefit of the experimental compared to control group. However, a study with a larger sample size is needed to further examine effects over time.

The current study was statistically underpowered. The target enrollment that would have provided sufficient statistical power was not realized despite best efforts. (See details in the 3-month outcome publication (Lewis et al. 2026)).

Data availability statement. The data sets analyzed and used in this current study can be made available from the corresponding author upon reasonable request with limitations.

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Ethics and consents. NCT05477784.

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