

CLIMB[®] Program Evaluation of Quality of life, the Stress Response, Self Esteem in Children Whose Parent Has Cancer: Pilot Study

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Abstract

Children with a parent who has cancer express fears about cancer contagion, parental death and security of their life. CLIMB[®] (Children's Lives Include Moments of Bravery) is a support program to improve children's ability to cope with their parent's cancer. This pilot study aims to describe the emotional impact of CLIMB[®] on children with a parent who has cancer. The elementary school version of QOL (Quality of life), the SRS-C (Stress Response Scale for Children), Self Esteem, and satisfaction were evaluated.

Participants were seven children (three girls, four boys). All participants were satisfied with CLIMB[®]. The QOL scores significantly increased from 79.9 (SD, 19.1; median, 86.7) points before the intervention to 85.1 (SD, 15.7; median, 90.0) points after the intervention, indicating an improvement in the QOL ($p=0.046$). Subscale was no significant difference according to sex. In the SRS-C scores no item showed significant differences in the pre- and post-intervention scores. The total score had decreased, indicating a decrease in the stress response. The boys showed a slight increase in the scores on the physical state subscale. The self-esteem scale scores were difference between the pre- and post-intervention scores increased significantly for the total score ($p=0.028$) and the subscales of "self in relationships" ($p=0.042$) and "self-assertion and self-determination" ($p=0.038$).

During CLIMB[®], children received accurate cancer knowledge; and valued sharing their feelings among others who are in the same situation. Children were highly satisfied with the program, although small changes were seen in QOL and stress.

Keywords: Cancer, Children with a parent who has cancer, CLIMB[®] (Children's Lives Include Moments of Bravery) program, QOL

1. Introduction

In recent years, the number of children with a parent who has cancer has increased, due to an increase in the number of young parents being diagnosed affected with cancer. Cancer statistics from the US Surveillance, Epidemiology, and End Results (SEER) Program estimate that 10.4% of newly diagnosed cancer patients in the United States are aged 18–55 years, and 22.4% of all cancer patients are aged 21–55 years (Howlader, et al., 2016). This age corresponds to the childbearing and childrearing years, suggesting that the majority of these patients have minor children. In addition, in the United States, an estimated 2.85 million minor children are living with a parent diagnosed with cancer (Weaver, et al., 2010). This means that at least 18% of the parents with cancer have minor children. In Japan, every year approximately 56,000 parents with minor children are diagnosed with cancer; currently an estimated 87,000 minor children have a parent with cancer in Japan (Izumi, et al., 2015). This represents roughly 4.3% of all children under the age of 18. Further, the average age of children whose parents have cancer is reported to be 11.2 years (standard deviation, 5.2 years); as per a previous study, boys aged 7–12 years accounted for highest proportion of the minor population whose parents had cancer, at about 14,000 children,

followed by boys and girls aged 0–6 years, at about 13,000 children each, and girls aged 7–12 years, at 12,000 children; children in elementary school accounted for more than half of this population (Izumi, et al., 2015). Recent improvements in cancer survival rates have also contributed to an increase in the number of cancer patients with minor children.

Children whose parents have cancer may incorrectly understand the disease and worry that cancer is transmittable as well as be fearful of the parent's death and life stability. These children report more physical complaints (Visser, et al., 2004) and emotional problems and higher stress response symptoms (Grabiak, et al., 2007; Visser et al., 2007) than children whose parents do not have cancer. Children whose parents have cancer have also been reported to have higher anxiety and lower quality of life (QOL) than the general 8–16-year-old population (Hauken, 2018). Children of patients with breast cancer have significantly more health problems than children of patients with other types of cancers (Altun, 2019). Children of cancer patients have also been found to be more socially isolated (Vannatta, et al., 2008) than their age-matched peers, particularly at school age. Conversely, some studies outlined positive changes in children whose parents had cancer (Kissil, et al., 2010; Wong, et al., 2009). In these studies, about half of the adults whose parents had cancer when they were children experienced posttraumatic growth; due to their painful experiences that they gained an increased appreciation for life. In addition, these studies reported a deep sense of trust in relationships, increased personal strength, and positive changes in health-related behaviors among such adults. Adequate support reduces the stress levels in children and fosters communication between parents and children. It is important to support children by building on their strengths, as this will have an impact on the parents' own struggles with cancer.

Children are effectively supported when they receive support promptly after a parent's cancer diagnosis; when they meet with peers of the same age who are in a similar situation and when they are enabled to carry on as usual with their daily lives, their anxiety is reduced (Kennedy & Lloyd-Williams, 2009; Sears & Sheppard, 2004). In addition to the child's peers and school, parents and other adult family members are also important supporters (Davey, et al., 2011). However, without professional intervention, it may be difficult to provide effective support. One type of support available for children is the CLIMB[®] program. This program was developed by The Children's Treehouse Foundation (childrenstreehousefdn.org, 2022) in the United States for children whose parents have cancer. It is a program that mainly supports primary school children; the program aims to empower children and build their capacity to cope with the stresses associated with their parent's illness. In this program, children work in a group to create various objects and express their feelings. The effects of CLIMB[®] have been documented by Kobayashi et al., (2017) who suggested that participation in the CLIMB[®] program in Japan improved the quality of life (QOL) of children with posttraumatic stress symptoms as well as that of their parents, and Neill et al. (2019) found that providing families the opportunities to talk about cancer can help minimize the risk of psychological and social problems. These studies focused on QOL and stress responses; however, the aim of the CLIMB[®] program is to harness the capabilities of children, and this aspect has not been adequately explored. Therefore, in the present study, in addition to QOL and stress reactions, we examined self-esteem as a measure of children's own abilities. It has been reported that when self-esteem is enhanced, children recognize their own self-worth, learn how to build relationships with those around them, and are likely to ask for help when they are in trouble (Tokyo Metropolitan Staff Training Center, 2011).

The purpose of this study was to evaluate the QOL, stress reaction, and self-esteem of children who participated in the CLIMB[®] program. The following research questions were addressed: 1) To what extent do the QOL, stress reaction, and self-esteem change after the program, 2) do these changes differ by age and sex?, and 3) what is the level of satisfaction with the program and the acquired experiences?

2. Method

2.1 Study Setting and Participants

The study design was a pre-post test single group pilot study. The participants were elementary school children aged 6–12 years whose parents were diagnosed with cancer in Japan and who were informed about their parent's cancer. Further, these children were participating in the CLIMB[®] program. Children with severe mental or intellectual disabilities were excluded since CLIMB[®] is a group program, so if a child has difficulty understanding the content of the program, that child would need individual attention.

The CLIMB[®] programs were held in August 2019 and March 2020. Before starting the program, the aims of the study were explained to the parents and children. After informed consent was obtained from the parents and children, the participants were asked to complete a questionnaire survey before and after the program.

2.2 CLIMB® Program

CLIMB® stands for Children's Lives Include Moments of Bravery. Participants are parents who have cancer and their children for elementary school students.

The purpose of CLIMB® is to help children unlock their own strengths and increase their ability to cope with the stresses associated with parental illness. CLIMB® sessions are structured programs that are conducted in closed groups in the following manner: After confirming the attendance of the participating parents and children, they are divided into separate rooms. The parents have an unstructured free discussion with health care providers, and the children are guided by the staff (Table 1). The program has three goals for children: (1) learning ways in which they can express their emotions, (2) learning ways to communicate their emotions to those around them, and (3) learning ways to cope with their emotions. Specific emotions are dealt with in each session, and the children interact with each other through crafts and cancer-related education.

The program usually consists of six sessions, with one 2-hr session held every other week. However, for the present study, the program was consolidated to four sessions, with one 2.5-hr session held every other week, considering the poor transportation access in the region and to make sure the session dates coincide with children's long vacation dates.

The CLIMB® program staff includes facilitators and assistants. The not-for-profit organization Hope Tree (2008) conducts facilitator training courses for those wishing to become facilitators; their main duties include facilitating the program, grasping the overall situation, and observing the situation empathetically. Doctors, nurses, clinical psychologists, and nursing students function as assistants; their main duties are to help the children understand the contents of the sessions, supervise the working group, and promote interactions among the children.

Table 1. Content of the CLIMB® Program for the children's group

	Activity's Goal	Feeling of the day	Activity
1	Decrease isolation by sharing cancer story with other children and learn about feeling using happy as exemplar	Happy	"All about me" To help the children self-disclose feelings about the parent's illness and make sense of the event and to build cohesion and increase trust among the children.
2	Increase the children's knowledge about cancer and its treatment	Confused	"What is Cancer" Share your feelings of confusion. Learn about cancer.
3	Normalize feelings of sad	Sad	"Feeling mask" Making masks to express sad feelings. Sharing feelings of sadness.
4	Assist the children in identifying strengths and normalizing anxiety	Scared	"Strong Box" Create a strength box that expresses your strengths. Decorate the box with a representation of what you like and your strengths to overcome fear and anxiety. Share with everyone about your strengths.
5	Assist the children in expressing and managing anger in healthy ways	Mad	"Anger cube" Share feelings of anger and write anger and stress management strategies on dice.
6	Facilitate communication with the parent who has cancer	Feelings for Parents	"Get well card" Write a get well note to parent with cancer

2.3 Questionnaire Contents

We conducted an anonymous questionnaire survey before and after the CLIMB® program. The attributes were gender, age, grade, which parent had cancer, and the type of cancer.

The Kid-KINDL® Elementary School Quality of Life Scale (Shibata, et al., 2003) was used to assess the children's own QOL. This scale asks questions about the child's state over the past one week and consists of six subscales

with a total of 24 questions. The Cronbach's alpha coefficient was 0.84, confirming internal consistency. It consists of the following subscales: physical health ($\alpha = 0.62$), emotional wellbeing ($\alpha = 0.56$), self-esteem ($\alpha = 0.71$), family ($\alpha = 0.64$), friends ($\alpha = 0.57$), and school life ($\alpha = 0.43$). The items are scored using a 5-point scale, with responses ranging from "very applicable" to "not applicable at all." The scores range from 24 to 120 points (converted to 0–100 for this study), with higher scores indicating higher QOL. The reliability and validity of the instrument in the elementary school population have been confirmed.

The Stress Response Scale for Children (SRS-C) was used to measure the stress response of children (Shimada, et al., 1994). This scale asks questions about current state and consists of four subscales with a total of 20 questions. The Cronbach's alpha coefficient was 0.92, confirming internal consistency. The subscales included physical state (Cronbach's $\alpha = .82$), depressive-anxious feeling ($\alpha = .79$), irritated-angry feeling ($\alpha = .81$), and helplessness ($\alpha = .77$). The scores ranged from 20 to 80 points, with higher scores indicating higher stress responses. The reliability and validity of the instrument have been confirmed for the fourth-to-sixth-grade population.

Rosenberg's Self-Esteem Scale (Japanese version) (2011) was used to measure self-esteem. It asks questions about one's current state and consists of three subscales with a total of 22 questions. To assess the internal validity of the scale, Pearson's correlation was employed; Pearson's r was 0.70, indicating a strong correlation (Ito & Wakamoto, 2010). This scale included the following subscales: self-evaluation and self-acceptance, self in relationships, and self-assertion and self-determination. The items were scored using a 4-point scale, ranging from "agree" to "disagree," with scores ranging from 22 to 88 points, and higher scores indicating higher self-esteem. The reliability and validity of the scale have been confirmed for the fifth- and sixth-grade populations. Although the aforementioned three scales have limited use for first-to-third-grade students, our research team examined the content of the questions and the method of answering and believed that they could be answered with some support from adults, so we decided to use them in this study.

To evaluate the level of satisfaction with the program, we used an evaluation developed by Hope Tree (2008). The questionnaire consists of 10 questions, including "I am glad to be here," "I was good talk to others about their feelings," "I think the group would help other children," and "The staff was kind and friendly." The items were scored used a 5-point response scale, with responses ranging from "very much" to "not at all." In addition, we also asked the participants to write freely about what they liked the most and about their own feelings and impressions.

2.4 Analyses

The individual attributes were simply tabulated, and the scores of the QOL, stress reaction, and self-esteem scales were recorded at two time points, before and immediately after the program. The pre- and post-intervention scores were compared using the Wilcoxon signed rank test. The scores of the post-intervention satisfaction evaluation were recorded, and the free response items were summarized to examine the characteristics of the participants by sex and grade.

2.5 Ethical Considerations

This study was approved by the Ethics Committee of the author's University (Approval No. 2262). And, as a clinical trial registration, we registered with the University Hospital Medical Information Network (UMIN) in Japan (registration number: UMIN000043504). We explained the research to the children and their parents using informed consent documents. The contents were 1) research background and purpose, method, 2) method of protecting personal information, and 3) questionnaire is anonymous, not disclosing any personally identifiable information when disclosing the results. In addition, it also said that if physical and psychological hard are experienced, the problem will be referred to the pediatrician or pediatric clinical psychologist. After the explanation, consent was obtained from parents. If the child seemed to have difficulty understanding any part of the information, when answering the questionnaire, the CLIMB[®] staff gave a supplementary explanation verbally. Participants in the study attended CLIMB[®] free of charge and received refreshments as part of the program. No monetary incentives were given for participation in the study.

3. Results

One site (facility) participated in the study. Of the nine children who attended the sessions, seven participated in the present study. The demographics of the seven children are shown in Table 2. The sample included four boys and three girls. The mean age of the children was 9.1 (standard deviation [SD], 1.8; median, 9.0) years. In most cases, the mothers had cancer. The common types of cancers were breast, pancreatic, and rectal cancer. All eligible children lived with their parents, and their parents' medical condition was stable during the CLIMB[®] sessions. The treatment plan and hospital of treatment did not change during the study period.

Table 2. Participant characteristics and Comments about CLIMB®

ID	Gender	Age	Grade	Parental cancer	Comments	
					The best part of the program	Free Comments
1	boy	7	1 st	Mother/pancreatic	drawing	It was all fun and joyful.
2	boy	7	2 nd	Mother/ breast	Crafts were fun	It was fun. I learned for the first time that cancer is not contagious.
3	boy	9	3 rd	Mother /pancreatic	I enjoyed looking at the Intravenous drip.	I learned a lot from what I could learn about my mom’s anti-cancer infusion. I would like to do the craft again.
4	girl	9	4 th	Mother/breast	It was nice to see and talk to a friend.	I learned about my mother’s illness. I am now able to ask my mother about things I don’t understand or worry about. My mother is now able to talk to me about her illness.
5	boy	10	4 th	Mother /breast	Nice to talk to a friend.	I was able to tell my mother how I feel, which I normally can’t say.
6	girl	10	4 th	Mother/ breast	Good to hear from other friends.	It gave me courage to think that I am not alone. I want to see my friends again.
7	girl	12	6 th	Father/colorectal	It was interesting to hear other people’s work and thoughts.	It was refreshing to talk a lot.

Table 3 shows the QOL scores, and Figure. 1 shows the pre-post-intervention changes in the total QOL scores. The scores significantly increased from 79.9 (SD, 19.1; median, 86.7) points before the intervention to 85.1 (SD, 15.7; median, 90.0) points after the intervention, indicating an improvement in the QOL (p=0.046). A significant increase from 72.9(SD, 20.2; median, 75.0) points to 85.0 (SD, 19.4; median, 90.0) points was observed in the mental health subscale (p=0.046). There was no significant difference according to sex, and there were no changes in the QOL of girls in friends and school life subscales.

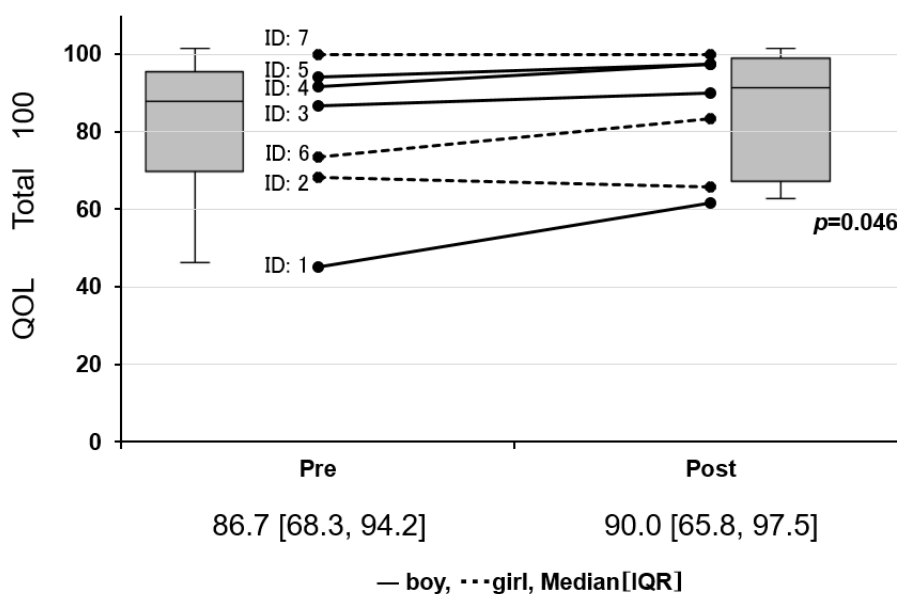


Figure 1. QOL Total score

Table 3. QOL comparison before and after CLIMB® (N = 7)

		n	Pre		Post		P-value
			data		data		
Physical health							
Total	mean ± sd	7	86.4	± 16.5	92.1	± 10.4	0.066
	median [IQR]		95.0	[75.0, 100.0]	95.0	[80.0, 100.0]	
Boy	mean ± sd	4	86.3	± 21.0	92.5	± 11.9	0.180
	median [IQR]		95.0	[65.0, 98.8]	97.5	[80.0, 100.0]	
Girl	mean ± sd	3	86.7	± 12.6	91.7	± 10.4	0.180
	median [IQR]		85.0	[75.0, 100.0]	95.0	[80.0, 100.0]	
Emotional wellbeing							
Total	mean ± sd	7	72.9	± 20.2	85.0	± 19.4	0.046 *
	median [IQR]		75.0	[65.0, 85.0]	90.0	[60.0, 100.0]	
Boy	mean ± sd	4	67.5	± 22.5	86.3	± 21.4	0.068
	median [IQR]		75.0	[43.8, 83.8]	95.0	[63.8, 100.0]	
Girl	mean ± sd	3	80.0	± 18.0	83.3	± 20.8	0.655
	median [IQR]		75.0	[65.0, 100.0]	90.0	[60.0, 100.0]	
Self-esteem							
Total	mean ± sd	7	82.9	± 25.8	87.9	± 19.1	0.180
	median [IQR]		100.0	[60.0, 100.0]	100.0	[60.0, 100.0]	
Boy	mean ± sd	4	83.8	± 32.5	90.0	± 20.0	0.317
	median [IQR]		100.0	[51.3, 100.0]	100.0	[70.0, 100.0]	
Girl	mean ± sd	3	81.7	± 20.2	85.0	± 21.8	0.317
	median [IQR]		85.0	[60.0, 100.0]	95.0	[60.0, 100.0]	
Friends							
Total	mean ± sd	7	75.7	± 21.9	79.3	± 17.7	0.180
	median [IQR]		85.0	[55.0, 95.0]	85.0	[60.0, 95.0]	
Boy	mean ± sd	4	76.3	± 24.6	82.5	± 15.5	0.180
	median [IQR]		85.0	[51.3, 92.5]	87.5	[66.3, 93.8]	
Girl	mean ± sd	3	75.0	± 22.9	75.0	± 22.9	—
	median [IQR]		70.0	[55.0, 100.0]	70.0	[55.0, 100.0]	
Family							
Total	mean ± sd	7	80.7	± 21.9	84.3	± 17.9	0.414
	median [IQR]		85.0	[60.0, 100.0]	85.0	[60.0, 100.0]	
Boy	mean ± sd	4	82.5	± 26.0	86.3	± 18.9	0.317
	median [IQR]		92.5	[55.0, 100.0]	92.5	[66.3, 100.0]	
Girl	mean ± sd	3	78.3	± 20.2	81.7	± 20.2	0.655
	median [IQR]		75.0	[60.0, 100.0]	85.0	[60.0, 100.0]	
School life							
Total	mean ± sd	7	80.7	± 19.2	82.1	± 17.8	0.317
	median [IQR]		80.0	[60.0, 100.0]	80.0	[65.0, 100.0]	
Boy	mean ± sd	4	80.0	± 23.1	82.5	± 20.6	0.317
	median [IQR]		80.0	[60.0, 100.0]	85.0	[62.5, 100.0]	
Girl	mean ± sd	3	81.7	± 17.6	81.7	± 17.6	>0.999
	median [IQR]		80.0	[65.0, 100.0]	80.0	[65.0, 100.0]	

Total							
Total	mean ± sd	7	79.9	± 19.1	85.1	± 15.7	
	median [IQR]		86.7	[68.3, 94.2]	90.0	[65.8, 97.5]	0.046 *
Boy	mean ± sd	4	79.4	± 23.1	86.7	± 17.0	
	median [IQR]		89.2	[55.4, 93.5]	93.8	[68.8, 97.5]	0.066
Girl	mean ± sd	3	80.6	± 17.0	83.1	± 17.1	
	median [IQR]		73.3	[68.3, 100.0]	83.3	[65.8, 100.0]	0.655

converted to 0–100, Wilcoxon signed-rank test. * p<0.05

The scores range from 24 to 120 points (converted to 0–100 for this study), with higher scores indicating higher QOL.

The SRS-C scores are shown in Table 4. Pre-post-intervention changes in the total scores are shown in Figure 2. No item showed significant differences in the pre- and post-intervention scores. The total score had decreased, indicating a decrease in the stress response. The boys showed a slight increase in the scores on the physical state subscale. The girls showed a moderate decrease in the scores on the stress reaction subscale, but a pronounced decrease in the scores on the anger subscale.

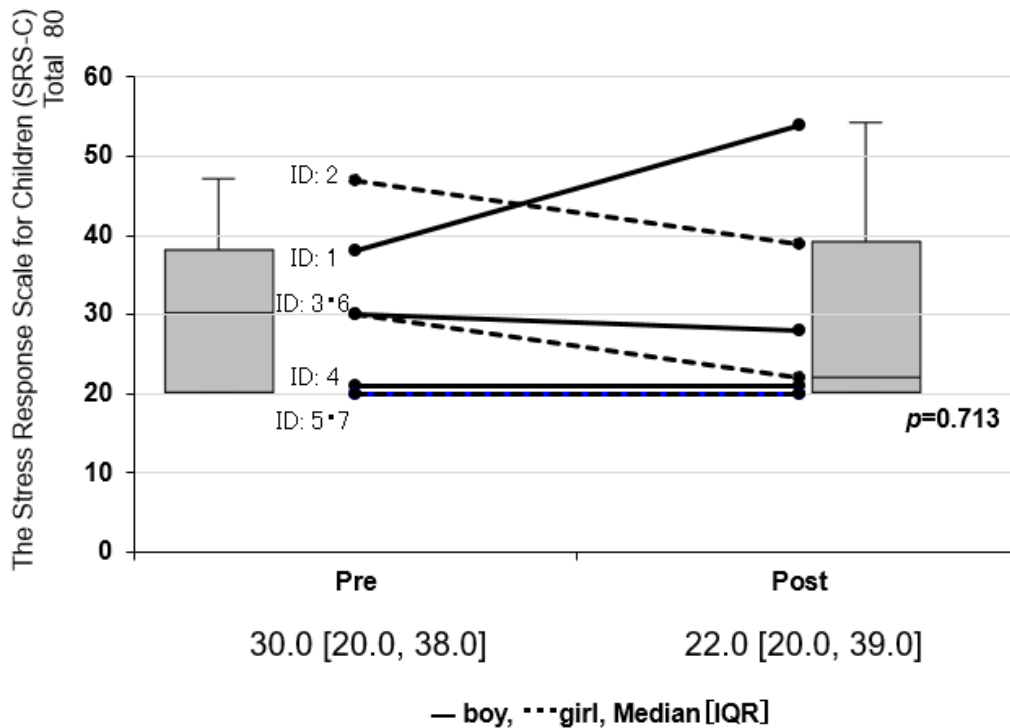


Figure 2. The Stress Response Scale for Children (SRS-C) Total Score

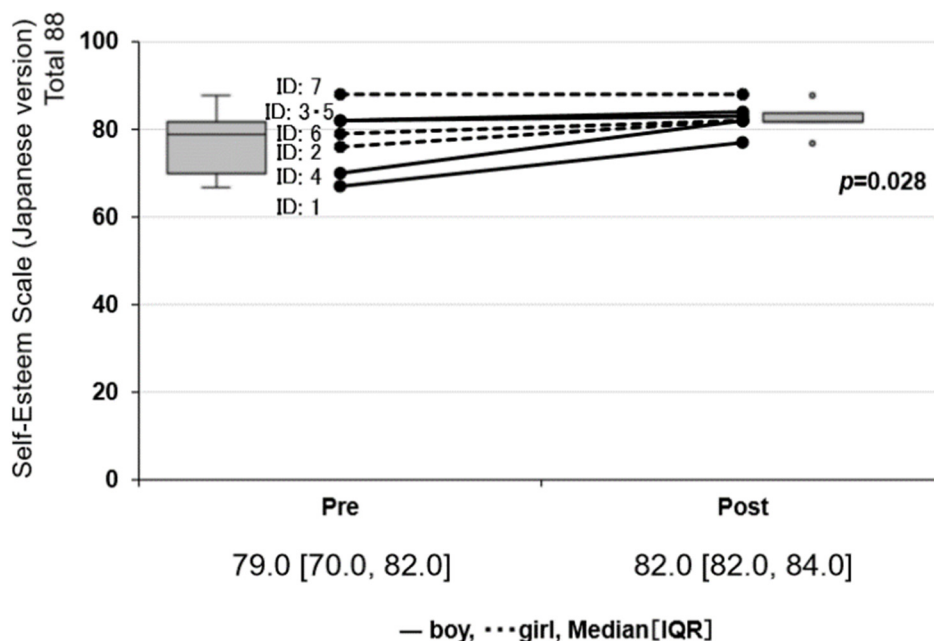
Table 4. SRS-C comparison before and after CLIMB® (N = 7)

		n	Pre		Post		P-value
			data		data		
Physical state							
Total	mean ± sd	7	8.0	± 4.0	7.4	± 3.3	0.357
	median [IQR]		6.0	[5.0, 12.0]	5.0	[5.0, 10.0]	
Boy	mean ± sd	4	7.5	± 3.3	7.3	± 2.6	0.655
	median [IQR]		6.5	[5.0, 11.0]	7.0	[5.0, 9.8]	
Girl	mean ± sd	3	8.7	± 5.5	7.7	± 4.6	0.180
	median [IQR]		6.0	[5.0, 15.0]	5.0	[5.0, 13.0]	
Depressive-anxious feeling							
Total	mean ± sd	7	6.9	± 2.9	7.1	± 3.8	0.655
	median [IQR]		5.0	[5.0, 11.0]	5.0	[5.0, 11.0]	
Boy	mean ± sd	4	6.8	± 2.9	7.3	± 4.5	0.655
	median [IQR]		5.5	[5.0, 9.8]	5.0	[5.0, 11.8]	
Girl	mean ± sd	3	7.0	± 3.5	7.0	± 3.5	>0.999
	median [IQR]		5.0	[5.0, 11.0]	5.0	[5.0, 11.0]	
Irritated-angry feeling							
Total	mean ± sd	7	7.4	± 3.4	6.4	± 2.9	0.414
	median [IQR]		5.0	[5.0, 11.0]	5.0	[5.0, 6.0]	
Boy	mean ± sd	4	5.8	± 1.5	7.0	± 4.0	0.317
	median [IQR]		5.0	[5.0, 7.3]	5.0	[5.0, 11.0]	
Girl	mean ± sd	3	9.7	± 4.2	5.7	± 0.6	0.180
	median [IQR]		11.0	[5.0, 13.0]	6.0	[5.0, 6.0]	
Helplessness							
Total	mean ± sd	7	7.1	± 2.4	8.1	± 4.3	0.285
	median [IQR]		6.0	[5.0, 10.0]	6.0	[5.0, 9.0]	
Boy	mean ± sd	4	7.3	± 2.6	9.3	± 5.4	0.180
	median [IQR]		6.5	[5.3, 10.0]	7.5	[5.3, 15.0]	
Girl	mean ± sd	3	7.0	± 2.6	6.7	± 2.1	0.423
	median [IQR]		6.0	[5.0, 10.0]	6.0	[5.0, 9.0]	
Total							
Total	mean ± sd	7	29.4	± 10.3	29.1	± 12.9	0.713
	median [IQR]		30.0	[20.0, 38.0]	22.0	[20.0, 39.0]	
Boy	mean ± sd	4	27.3	± 8.5	30.8	± 15.9	0.655
	median [IQR]		25.5	[20.3, 36.0]	24.5	[20.3, 47.5]	
Girl	mean ± sd	3	32.3	± 13.7	27.0	± 10.4	0.157
	median [IQR]		30.0	[20.0, 47.0]	22.0	[20.0, 39.0]	

Wilcoxon signed-rank test. * p<0.05

The scores ranged from 20 to 80 points, with higher scores indicating higher stress responses.

The self-esteem scale scores are shown in Table 5. Pre-post-intervention changes in the total scores are shown in Figure 3. The difference between the pre- and post-intervention scores increased significantly for the total score (p=0.028) and the subscales of “self in relationships” (p=0.042) and “self-assertion and self-determination” (p=0.038).



Figur 3. Self-Esteem Scale (Japanese version) Total Score

Table 5. Self-Esteem comparison before and after CLIMB® (N=7)

		n	Pre data		Post data		P-value
Self-acceptance							
Total	mean ± sd	7	27.7	± 4.0	29.6	± 2.1	0.109
	median [IQR]		29.0	[25.0, 32.0]	30.0	[28.0, 32.0]	
Boy	mean ± sd	4	26.8	± 4.8	30.0	± 1.6	0.109
	median [IQR]		27.0	[22.0, 31.3]	30.0	[28.5, 31.5]	
Girl	mean ± sd	3	29.0	± 3.0	29.0	± 3.0	>0.999
	median [IQR]		29.0	[26.0, 32.0]	29.0	[26.0, 32.0]	
Self in relationships							
Total	mean ± sd	7	24.9	± 2.7	26.6	± 1.5	0.042 *
	median [IQR]		25.0	[23.0, 28.0]	27.0	[25.0, 28.0]	
Boy	mean ± sd	4	24.5	± 3.1	26.3	± 1.5	0.109
	median [IQR]		24.5	[21.5, 27.5]	26.0	[25.0, 27.8]	
Girl	mean ± sd	3	25.3	± 2.5	27.0	± 1.7	0.180
	median [IQR]		25.0	[23.0, 28.0]	28.0	[25.0, 28.0]	
Self-assertion and self-determination							
Total	mean ± sd	7	25.1	± 1.8	26.4	± 1.7	0.038 *
	median [IQR]		25.0	[24.0, 27.0]	27.0	[25.0, 28.0]	
Boy	mean ± sd	4	24.0	± 0.8	25.3	± 1.3	0.102
	median [IQR]		24.0	[23.3, 24.8]	25.0	[24.3, 26.5]	
Girl	mean ± sd	3	26.7	± 1.5	28.0	± 0.0	0.180
	median [IQR]		27.0	[25.0, 28.0]	28.0	[28.0, 28.0]	

Total								
Total	mean ± sd		77.7	±	7.3	82.6	±	3.3
	median [IQR]	7	79.0		[70.0, 82.0]	82.0		[82.0, 84.0]
Boy	mean ± sd		75.3	±	7.9	81.5	±	3.1
	median [IQR]	4	76.0		[67.8, 82.0]	82.5		[78.3, 83.8]
Girl	mean ± sd		81.0	±	6.2	84.0	±	3.5
	median [IQR]	3	79.0		[76.0, 88.0]	82.0		[82.0, 88.0]

Wilcoxon signed-rank test. * p<0.05

The scores ranging from 22 to 88 points, and higher scores indicating higher self-esteem.

Most children selected response 5 of “very satisfied with the program” for all 10 questions on the evaluation. However, one first-grade boy and one second-grade boy selected response 2 of, “I don’t really think so” for the items of “I was glad to talk to others about my feelings” and “Listening to others talk about cancer reduced my feelings of being alone in the pain.” Table 2 shows the children’s impressions. The first–third graders mostly commented on the craft activities. The students in fourth grade and above described the joy of meeting friends in the same situation and being able to share their feelings.

4. Discussion

The purpose of this study was to assess whether the QOL, stress responses, and self-esteem changed after the CLIMB® program, and whether there the differences were modified by age and sex. The results showed an increase in the children’s mental health, as reflected by the increase in the total and subscale scores of QOL and in the self-assertiveness and self-determination subscales. Further, stress reactions showed a decrease. The children’s satisfaction was also high, indicating that the CLIMB® program in this study had a positive impact on children.

4.1 Changes after the CLIMB® Intervention

CLIMB® was effective in improving the children’s QOL. The pre-intervention QOL of the subjects was similar to that of children of healthy parents (Shibata, et al., 2007), indicating that parental cancer did not affect the QOL in the subjects of this study. The fact that the QOL improved may have been due to the sense of loneliness arising from the emotional burdens (Altun, 2019) of the children whose parents had cancer. In particular, children do not actively talk to their friends about their parent’s cancer, so the fact that the children in a similar situation gathered at CLIMB® and were able to share their feelings may be the reason for the improvement in their mental QOL. In terms of sex, there was no change in the QOL of girls in terms of friends and school life. It can be assumed that girls aged 9–12 years old and in the upper grades of elementary school already had enough friends in school and the neighborhood even if they were unable to talk about their parent’s cancer. Another reason may be that 9–12-year-olds are developmentally capable of acquiring multiple perspectives, and they understand how to act and behave in public places such as schools.

CLIMB® was effective in reducing the total SRS-C scores. Because pre-intervention total scores were lower than those in a previous study (Shimada, et al., 1994), it can be assumed that the original stress response was not strong, even though the parent had cancer. The lack of significant changes in the subscales of helplessness and depression may be related to the fact that the children participating in CLIMB® were originally informed about their parent’s cancer by the parents themselves. When children are not told the truth, they are more likely to hold misconceptions and feelings of remorse, such as thinking that it was their own fault that their parent had become ill, and this may negatively affect their growth and development (Siegel, et al., 1996). Because parents and children who participated in CLIMB® discuss cancer in the home and share their feelings with each other, perhaps a trusting relationship was already formed.

The boys showed a slight increase in the physical state scores. In terms of satisfaction, the boys found it difficult to share their feelings, listen to others, and relate their experiences to their peers. There are sex differences in development, and it is thought that boys face difficulties expressing their feelings in words at their age, so they express them physically. Girls showed a decrease in the scores on all subscales of the SRS-C, with a particularly pronounced decrease in anger. In upper elementary school children, exchange of positive or negative emotions have been shown to increase coping efficacy in stressful situations and reduce helplessness (Maki, 2019). Therefore, we believe that being able to share feelings with other children in the same situation provided a certain degree of support. We believe that the same reason holds true for the significant reduction in anger. In the

developmental stage, older children may not talk about their feelings as much. Iwata et al. (2020) used the Japanese version of the Strength and Difficulties Questionnaire (SDQ) with fifth- and sixth-grade students and their parents to assess their children's behavioral and emotional issues. Parents rated their children's behavioral problems (hyperactivity, inattention, etc.) similar to the ratings of their children. However, parents rated their children's emotional issues lower than their children did, indicating that the parents did not have an accurate understanding of their children's emotional issues. Therefore, an environment like CLIMB[®] where parents can discuss and share emotional problems with other parents is very important.

Self-acceptance an increasing trend. The total score had increased significantly after the intervention, and the scores on the "self in relationships" and "self-assertion and self-determination" subscales had also showed an increase. The reason for this may be related to the fact that the children felt accepted in the environment. Furthermore, the children's temperament and daily interactions with their parents and surroundings may also be related, but this could not be clarified in this study. Children with high self-acceptance have lower social anxiety and better relationships with others than those with low self-acceptance (Zahals, 2001). We infer that after participating in CLIMB[®], the children continued to live positively with their own strengths and with the help of those around them. Regarding the changes observed in self-acceptance, it can be assumed that the children were able to learn about role models by participating in CLIMB[®] and were able to view themselves positively with the help of external factors. In addition, being connected with children of the same age's generation who have the same problems is also important for being able to depict one's future self-image.

4.2 CLIMB[®] for Children

The participants had high satisfaction scores for CLIMB[®], and they enjoyed the program. CLIMB[®] programs gather groups of children whose parents have cancer; some children may have been reluctant to participate because they may have thought it focused on grief and fear related to their parent's cancer. However, we believe that we were able to promote continued participation by making the program enjoyable. The target participant this time included lower-to-upper elementary school students, and they were able to learn and understand the characteristics, treatments, and side-effects of cancer.

The younger boys were not very satisfied with talking about their feelings to others and listening to other people's experiences and feelings; however, they enjoyed the drawing and crafts programs. In addition, they learned for the first time that cancer is not contagious. This indicates that these children were previously living with the idea that they might get cancer from their parents. A previous study showed that compared with having no knowledge, having correct information about their parent's cancer can help reduce the stress levels in children (Siegel, et al., 1996). We believe that CLIMB[®] was able to relieve the anxieties that children have when they imagine that cancer can be transmitted to them. CLIMB[®] also provided enjoyable hands-on activities such as crafts. From the viewpoint of language development, younger children may have difficulty expressing and sharing their feelings. Boys are less likely to express their feelings than girls, and younger children are less likely to express their feelings than older ones (Watanabe & Fujino, 2016). Therefore, it is advisable to engage with younger children in a way that allows them to express their feelings through activities that require less language and tap into unconscious feelings. They can also be told what older children have said, using expressions that are easy to understand, while asking them questions to determine their understanding. In addition, opportunities for children to express their feelings non-verbally are also important.

4.3 Implications

CLIMB[®] targets elementary school students, and the purposes and procedures are the same for both younger and older students. However, younger children have immature linguistic skills and may have difficulty communicating their feelings and fully understanding what others say. Therefore, it is necessary to devise ways to help these children understand the content of CLIMB[®]. For example, when asking children to express their feelings, we suggest preparing pictures of various facial expressions and asking them to choose the one that matches their feelings. In addition, it is also a good idea to encourage children to express their feelings not only in words but also by means of arts and crafts and other activities.

Further, parents' wishes and desires must also be taken into account. Mothers diagnosed with breast cancer while parenting a young child (3–12 years old) valued communication with their child and wanted useful, practical, and easily accessible resources (Sinclair, et al., 2019). Therefore, it is important to promote communication between mothers and children through CLIMB[®]. However, some regions do not have easy access to CLIMB[®] owing to transportation difficulties. Another problem is the aforementioned coronavirus pandemic, making it necessary to conduct CLIMB[®] in a hybrid format that utilizes online meetings and resources. The effectiveness of the hybrid format also needs to be examined in the future.

5. Limitations

Although the number of subjects in this study was small, the data were valuable for pilot validation. The physical and psychological states of the parents in this study were stable, so there were no drastic changes in the children's lives. In addition, because the number of subjects was small, we were not able to analyze the impact of different types of cancers; this aspect must be studied in the future.

At the start of this study, the novel coronavirus (COVID-19) pandemic had started in Japan. At many sites, the CLIMB® sessions were cancelled or postponed. Since then, it has been difficult to have face-to-face CLIMB® sessions. In a previous study, adolescents and young adults with cancer found social media and online communities to be useful sources of information (Cheung & Zebrack, 2017) and community (Kaal et al., 2018), respectively. However, elementary school students may find it difficult to utilize social media until they are in their higher grades, but it is necessary to consider creating age-appropriate resources to help younger children interact with others.

6. Conclusion

During CLIMB®, children received accurate knowledge about cancer and valued sharing their feelings among others in the same situation. Children were highly satisfied with the program, although only small changes were seen in QOL and stress.

The coronavirus pandemic is an issue that necessitates CLIMB® to be conducted in a hybrid format that utilizes online meetings and resources. The effectiveness of the hybrid format also needs to be examined in the future.

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Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

References

- Altun, H. (2019). Evaluation of emotional and behavioral problems in school-age children of patients with breast cancer. *Turkish Journal of Oncology*, *34*, 12-20. <https://doi.org/10.5505/tjo.2018.1824>
- Cheung, C. K., & Zebrack, B. (2017). What do adolescents and young adults want from cancer resources? Insights from a Delphi panel of AYA patients. *Support Care Cancer*, *25*, 119-126. <https://doi.org/10.1007/s00520-016-3396-7>
- Children's Treehouse Foundation. (2022). Retrieved from <https://childrenstreehousefdn.org/who-we-are/>
- Davey, M. P., Tubbs, C. Y., Kissil, K., & Nino, A. (2011). 'We are survivors too': African-American youths' experiences of coping with parental breast cancer. *Psycho-oncology*, *20*, 77-87. <https://doi.org/10.1002/pon.1712>
- Grabiak, B. R., Bender, C. M., & Puskar, K. R. (2007). The impact of parental cancer on the adolescent: an analysis of the literature. *Psycho-oncology*, *16*, 127-137. <https://doi.org/10.1002/pon.1083>
- Hauken, M. A., Senneseth, M., Dyregrov, A., & Dyregrov, K. (2018). Anxiety and the quality of life of children living with parental cancer. *Cancer Nursing*, *41*, E19-E27. <https://doi.org/10.1097/NCC.0000000000000467>
- Howlader, N., Noone, A. M., Krapcho, M., Miller, D., Bishop, K., Altekruse, S. F., ... Cronin, K. A. (Eds). (2016) *SEER Cancer Statistics Review, 1975-2013*, National Cancer Institute. Retrieved from http://seer.cancer.gov/csr/1975_2013/ (based on November 2015 SEER data submission).
- HopeTree. (2008). <https://hope-tree.jp/> (In Japanese)
- Inoue, I., Higashi, T., Iwamoto, M., Heiney, S. P., Tamaki, T., Osawa, K., ... & Matoba, M. (2015). A national profile of the impact of parental cancer on their children in Japan. *Cancer Epidemiology*, *39*, 838-841. <https://doi.org/10.1016/j.canep.2015.10.005>
- Ito, M., & Wakamoto, J. (2010). An attempt to create a scale to measure self-esteem required at school, 52nd Annual Convention of the Japanese Association of Educational Psychology, Collected Papers. (In Japanese)
- Iwata, N., Kumagai, R., & Saeki, I. (2020). Do mothers and fathers assess their children's behavioral problems in the same way as do their children? An IRT investigation on the strengths and difficulties questionnaire. *Japanese Psychological Research*, *62*, 87-100. <https://doi.org/10.1111/jpr.12268> (In Japanese)

- Kaal, S. E., Husson, O., van Dartel, F., Hermans, K., Jansen, R., Manten-Horst, E., ... & van der Graaf, W. T. (2018). Online support community for adolescents and young adults (AYAs) with cancer: user statistics, evaluation, and content analysis. *Patient Prefer Adherence*, *12*, 2615-2622. <https://doi.org/10.2147/PPA.S171892> (In Japanese)
- Kennedy, V. L., & Lloyd-Williams, M. (2009). How children cope when a parent has advanced cancer. *Psycho-oncology*, *18*, 886-892. <https://doi.org/10.1002/pon.1455>
- Kissil, K., Nino, A., Jacobs, S., Davey, M., & Tubbs, C. Y. (2010). "It has been a good growing experience for me": Growth experiences among African American youth coping with parental cancer. *Families, Systems and Health*, *28*, 274-289. <https://doi.org/10.1037/a0020001>
- Kobayashi, M., Heiney, S. P., Osawa, K., Ozawa, M., & Matsushima, E. (2017). Effect of a group intervention for children and their parents who have cancer. *Palliative Support Care*, *15*, 575-586. <https://doi.org/10.1017/S1478951516001115>
- Maki, I. (2019). Influences of emotional exchanges with guardians on elementary school students' helplessness: analysis by structural equation modeling. *Japanese Journal of Educational Psychology*, *67*, 223-235. <https://doi.org/10.5926/jjep.67.223> (In Japanese)
- O'Neill, C., O'Neill, C. S., & Semple, C. (2020). Children navigating parental cancer: outcomes of a psychosocial intervention. *Comprehensive Child and Adolescent Nursing*, *43*, 111-127. <https://doi.org/10.1080/24694193.2019.1582727>
- Sears, H. A., & Sheppard, H. M. (2004). "I just wanted to be the kid": adolescent girls' experiences of having a parent with cancer. *Canadian Oncology Nursing Journal*, *14*, 18-25.
- Shibata, R., Nemoto, Y., Matsuzaki, K., et al. (2003). A study of the Kid-KINDL Questionnaire for measuring quality of life in elementary school children in Japan. *Journal of the Japan Pediatric Society*, *107*, 1514-1520. (In Japanese)
- Shimada, N., Togasaki, Y., & Sakano, Y. (1994). *Development of Stress Response Scale for Children*. *The Japanese Journal of Health Psychology*, *7*, 46-58. https://doi.org/10.11560/jahp.7.2_46 (In Japanese)
- Siegel, K., Karus, D., & Raveis, V. H. (1996). Adjustment of children facing the death of a parent due to cancer. *Journal of the American Academy of Child and Adolescent Psychiatry*, *35*, 442-450. <https://doi.org/10.1097/00004583-199604000-00010>
- Sinclair, M., Schofield, P., Turner, J., Rauch, P., Wakefield, C., Mann, G. B., ... Stafford, L. (2019). Maternal breast cancer and communicating with children: a qualitative exploration of what resources mothers want and what health professionals provide. *European Journal of Cancer Care*, *28*, e13153. <https://doi.org/10.1111/ecc.13153>
- Tokyo Metropolitan Staff Training Center. (2011). *Research on self-esteem and self-affirmation*. Retrieved from <https://www.kyoiku-kensyu.metro.tokyo.lg.jp/09seika/reports/bulletin/h23.html> (In Japanese)
- Vannatta, K., Grollman, J. A., Noll, R. B., & Gerhardt, C. A. (2008). Impact of maternal breast cancer on the peer interactions of children at school. *Psycho-oncology*, *17*, 252-259. <https://doi.org/10.1002/pon.1232>
- Visser, A., Huizinga, G. A., van der Graaf, W. T. A., Hoekstra, H. J., & Hoekstra-Weebers, J. (2004). The impact of parental cancer on children and the family: a review of the literature. *Cancer Treatment Reviews*, *30*, 683-694. <https://doi.org/10.1016/j.ctrv.2004.06.001>
- Visser, A., Huizinga, G.A., Hoekstra, H. J., van der Graaf, W. T., Gazendam-Donofrio, S. M., & Hoekstra-Weebers, J. (2007). Emotional and behavioral problems in children of parents recently diagnosed with cancer: a longitudinal study. *Acta Oncologica*, *46*, 67-76. <https://doi.org/10.1080/02841860600949560>
- Watanabe, Y., & Fujino, S. (2016). The development of emotional literacy on children; focusing on emotional expressions 2016. *Hose University Bulletin* *73*, 83-97. (In Japanese)
- Weaver, K. E., Rowland, J. H., Alfano, C. M., & McNeel, T. S. (2010). Parental cancer and the family: a population-based estimate of the number of US cancer survivors residing with their minor children. *Cancer*, *116*, 4395-4401. <https://doi.org/10.1002/cncr.25368>
- Wong, M. L., Cavanaugh, C. E., Macleamy, J. B., Sojourner-Nelson, A., & Koopman, C. (2009). Posttraumatic growth and adverse long-term effects of parental cancer in children. *Families, Systems and Health*, *27*, 53-63. <https://doi.org/10.1037/a0014771>

Zahals, E. (2001). The child's worries about the mother's breast cancer sources of distress in school age children. *Oncology Nursing Forum*, 28, 1019-1025.

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