Research Report

Internet-Based Self-Help Mindful Self-Compassion Intervention for Parents of Children With Cancer: A Pilot Study

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Abstract

Background: Parents of children with cancer may experience persistent psychological distress and impaired physical health throughout their children's diagnosis and treatment.

Objective: This study aimed to develop a mindful self-compassion program for parents of children with cancer and explore its effect.

Methods: This pre-post-test study without a control group was conducted with 34 Chinese parents of children with cancer, using mixed methods. Participants received a 6-week internet-based self-help mindful self-compassion intervention. Self-compassion, post-traumatic stress symptoms, depression, and sleep quality were measured at baseline and at 10 weeks post-baseline. Semi-structured interviews were conducted with 9 completers within 10 days after the intervention was completed.

Results: Significant differences were observed in self-compassion, re-experiencing, physical depressive symptoms, and sleep quality. Two participants reported feeling miserable or recalling distressing experiences, of which one withdrew from the study while the other completed the intervention.

Conclusion: The program could improve self-compassion, re-experiencing, physical depressive symptoms, and sleep quality in parents of children with cancer, which demonstrated the feasibility of delivering a self-help mindful self-compassion intervention through the internet. Increasing retention rates in future studies merits further discussion.

Keywords

pediatric oncology, parent, self-help, mindfulness, self-compassion

Every year, 400 000 children and adolescents aged 0 to 19 years are diagnosed with cancer globally.[1] The unexpected diagnosis of childhood cancer often leads to challenges for the entire family.[2] Throughout their medical journey, parents of children with cancer (PCCs) often experience ongoing psychological distress and physical health challenges resulting from the diagnosis and care obligations.[3] As a result, PCCs have a higher prevalence of post-traumatic stress symptoms,[4] depression,[3] and sleep disturbance[5,6] than parents of healthy children.

Post-traumatic stress symptoms can manifest as repeated frightening thoughts, shock, fear, and feelings of helplessness.[3] In Chinese parents whose children are undergoing treatment for cancer, the prevalence of severe post-traumatic stress symptoms reached 32.97% by 2017,[7] with higher incidence during treatment than after treatment.[8] Post-traumatic stress symptoms in PCCs have been found to be positively related to post-traumatic stress symptoms in children and negatively affect PCCs' quality of life.[4,9] Depression is a common co-existing condition,[10] with 28% of PCCs having

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moderate to high depression according to a meta-analysis.[3] A higher level of depression may predict a lower level of resilience, preventing PCCs from managing their emotions, finding meaning, or overcoming difficulties related to their child's cancer treatment.[11,12] In addition, caregivers with depression are more likely to report poor sleep quality,[13] which affects approximately 70.9% of PCCs,[14] further impairing their ability to complete critical tasks[15] and lowering their quality of life.[16]

Receiving a psychological intervention to develop a positive mindset, such as self-compassion, may benefit PCCs in adapting coping strategies to face a series of challenges.[17] Self-compassion, defined as treating oneself kindly when facing difficulties, comprises 6 components: increased self-kindness, common humanity, and mindfulness, as well as reduced self-judgment, isolation, and overidentification.[18] Research indicates that self-compassion predicts improvement in post-traumatic stress symptoms and depression,[19,20] and has a correlational and causal relationship with improved subjective sleep quality.[21] In view of the positive effect of self-compassion, various interventions have been developed to enhance self-compassion.[22] Mindful self-compassion (MSC), a structured 8-week program to develop self-compassion in the general public, is one of the most commonly used interventions.[23,24] Campo et al[25] found that the MSC program was effective at improving self-compassion, mindfulness, post-traumatic growth, and depression in young adult cancer survivors. However, there is little research exploring the effect of MSC on PCCs, despite the need for improvement in this population.

The traditional MSC program is delivered in a face-to-face group format with 2-hour sessions once a week for 8 weeks. However, PCCs have varying leisure time, leading to challenges related to logistics of group meetings and time management. Thus, a long-term, group-based MSC program may not be feasible or acceptable for PCCs. A self-help intervention that allows participants to choose when to receive support may also help address logistical difficulties, and it has been confirmed to be effective in improving psychological outcomes for PCCs.[26] In addition, short-duration interventions might be more convenient for PCCs who have fragmented schedules. Brooker and colleagues[27] conducted an abbreviated 8-week MSC program lasting 105 minutes once per week among adult cancer patients and observed a small-to-medium improvement in self-compassion. Brief interventions might be compatible with the schedule of PCCs and effective in improving mental health.

Purpose

Given the limited leisure time for PCCs, we recognized the convenience of internet-based interventions and consulted with experts to develop an evidence-based self-help MSC intervention program designed specifically for PCCs called the Self-Help Mindful Self-Compassion Program for Parents of Children with Cancer. This study aimed to: (1) develop a tailored MSC program for PCCs that was characterized by self-help; (2) verify the effectiveness of the program in improving self-compassion, post-traumatic stress symptoms, depression, and sleep quality; and (3) assess the level of adherence, satisfaction, and safety of the program.

Methods

Study Design

This was a mixed-methods, pre- and post-intervention study without a control group. The quantitative data involved recruitment data and pre-post-intervention changes in psychological outcomes. Meanwhile, the qualitative phase assessed participants' experiences with the intervention in greater detail.

Participants

From July to November 2020, parents of hospitalized children with cancer were recruited from the Department of Pediatrics of 2 general hospitals in southern China. To be included in the study, parents had to meet specific criteria: (1) they were the primary caregiver (either a father or non-pregnant mother) of children aged 0 to 18 years who had been diagnosed with cancer; (2) they owned a smartphone; and (3) they could read and speak Chinese fluently. Parents were excluded if they met any of the following conditions: (1) they had experienced other traumatic events; (2) they were undergoing psychological treatment; or (3) their child was receiving palliative care.

Intervention

Program development. First, 2 researchers who had received evidence-based training conducted an overview of systematic reviews,[28] which suggested that mindfulness-based interventions were effective in reducing post-traumatic stress symptoms with minimal side effects. Based on this information, a draft of the intervention program was developed by the principal investigator, who had undergone mindfulness training. The program was based on the MSC program[24] and mindfulness-based stress reduction.[29] Furthermore, the program's reliability, safety, and feasibility were assessed by 5 specialists from the fields of psychiatry, mindfulness, pediatric oncology nursing, and health education. They evaluated the program using a self-designed 5-point Likert scale. The panel of experts consisted of 1 psychiatrist and psychology professor with 8 years of group-based mindfulness instructing experience, 1 doctorally prepared psychologist, and 1 midwife with more than 5 years of mindfulness instructing experience. All specialists had more than 10 years of work experience except the psychologist. The reliability and safety of the program received

an average score of 5 points, while the feasibility received an average score of 4.83 points. Based on previous study benchmarks[30] and specialists' suggestions, the standard of completion was set to be finishing at least 66.67% of courses within 8 weeks. We interviewed 14 PCCs, 6 health professionals, and 1 social worker and collected suggestions about the program to make it more practical. According to feedback from the experts and interviewees, the program was shortened to 6-week duration, consisting of 6 classical parts (beyond automatic pilot, allowing things to be as they already are, discovering self-compassion, practicing loving-kindness, customizing self-compassion, and embracing life). The initial 2 segments of the program were derived from mindfulness-based stress reduction,[29] while the subsequent 4 segments were sourced from MSC.[24] Each part contained 4 easily navigated curricula lasting 15 to 35 minutes, with a total of 24 curricula included in the program. The material comprised texts, audio recordings, and photos that were uploaded to a cost-free, interactive, private platform accessible to PCCs. Appendices containing introduction and guidance for each lesson allowed PCCs to practice anywhere in their leisure time.

Intervention implementation. The intervention working group consisted of a team of professionals, including 2 postgraduate students who had received mindfulness training, 1 pediatric nurse, 1 clinical psychologist with more than 5 years of mindfulness instructing experience, and 1 methodologist. All researchers involved in recruitment and data collection received unified training before the intervention began. When recruiting participants, the study's purpose and content were explained to PCCs. Before attending the class, they provided written informed consent and completed baseline questionnaires. In addition, an online meeting was held to strengthen trust between researchers and PCCs. A WeChat group was created for easy communication and feedback after recruitment. A group contract was also established during the meeting to improve adherence to the program. Researchers delivered the required course on schedule, but PCCs were given the freedom to decide when to complete it. Meanwhile, we encouraged PCCs to do a 30-minute homework practice every day, but PCCs had the autonomy to decide whether to engage in these practices, as well as when and how much time to devote to the practice. Parents of children with cancer were instructed to record the exercise details and duration in a mindfulness log provided by the researchers, and the platform logged usage automatically. In addition, PCCs and researchers could interact with each other through weekly telephone calls or message boards on the platform. At 10 weeks post-baseline, PCCs who had completed the program were asked to complete a post-intervention assessment. To improve adherence, PCCs who did not complete a particular activity were contacted via WeChat message during the intervention period.

Measures

Self-compassion. Self-compassion of PCCs was measured using the Chinese version of the Self-Compassion Scale (SCS).[31] The SCS comprises 26 items that measure 6 dimensions: self-kindness, self-judgment, common humanity, isolation, mindfulness, and overidentification. Items are rated from 1 (almost never) to 5 (almost always), with 13 items being reverse-scored. The total score is the sum of the average scores for each dimension, ranging from 6 to 30. Higher scores indicate greater self-compassion. The Chinese version of the SCS has demonstrated good psychometric properties in Chinese undergraduate students.[32] In this study, Cronbach's α was 0.85 for the total scale, indicating high internal consistency.

Post-traumatic stress symptoms. The Chinese version of the Post-Traumatic Stress Checklist–Civilian version (PCL-C)[33] was used to evaluate post-traumatic stress symptoms of PCCs. The scale comprises 17 items that assess 3 dimensions: re-experiencing, avoidance, and hyperarousal. Parents of children with cancer were asked to rate how much they had been bothered by each issue in the last month regarding their child's experience with cancer. Items are rated from 1 (not at all) to 5 (seriously). Scores on the PCL-C range from 17 to 85, with higher scores indicating greater stress. The Chinese version of the PCL-C has demonstrated good psychometric properties in Chinese PCCs.[7] In this study, the Cronbach's α was 0.93 for the total scale, indicating high internal consistency.

Depression. The Chinese version of the Patient Health Questionnaire Depression Scale-9 (PHQ-9)[34] was used to measure depression among PCCs. This 9-item measure evaluates both emotional and physical symptoms. Respondents rate the frequency of their symptoms experienced in the last 2 weeks on a scale from 0 (never) to 3 (almost every day). The summed score ranges from 0 to 27, with higher scores indicating greater symptom severity. The Chinese version of the PHQ-9 has been validated with Chinese PCCs and has shown good psychometric properties.[7] In this study, the Cronbach's α was 0.90 for the total scale, indicating high internal consistency.

Sleep quality. The Chinese version of the Pittsburgh Sleep Quality Index[35] was used to assess the sleep quality of PCCs in the last month. The scale consists of 18 self-reported items and 5 observer-reported items. The self-reported items evaluate various factors related to sleep, including sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, hypnotic use, and daytime function. The total score is calculated by summing the self-reported items, with higher scores indicating poorer sleep quality. The Chinese version of the Pittsburgh Sleep Quality Index has shown good reliability in family caregivers of cancer patients from Hong Kong.[36] In this study, Cronbach's α of the total scale was 0.82, indicating good internal consistency.

Adherence and satisfaction. To determine PCCs' adherence to the program, we calculated the proportion of the number of completed lessons to the total number of lessons. Data regarding PCCs' learning schedule on the platform were collected by a researcher who was not involved in the intervention. To evaluate satisfaction with the program, we administered a self-designed satisfaction questionnaire consisting of 8 items rated on a 5-point scale ranging from 1 to 5. The items included (1) I think the 6-week course duration is suitable; (2) I think it's appropriate to have 4 classes per week; (3) I think each course lasting 15 to 35 minutes is appropriate; (4) I can accept/insist on practicing homework for 30 minutes every day; (5) MSC helped me resist and manage stress, and increase self-love; (6) I think this program is useful for me and other parents; (7) I felt relaxed and enjoyed during learning about MSC, and I like it very much; and (8) I will recommend this program to other parents. We considered an average score of at least 3 in the latter 4 items as the benchmark for acceptability.

Safety. Participants were instructed to note any discomfort experienced during the course or practice in the mindfulness log. We assessed safety by recording the number and types of symptoms participants reported as negative experiences associated with the intervention, such as sadness and depression.

Experience. We invited completers to conduct semi-structured interviews within 10 days after the intervention ended to collect the feedback and suggestions. The semi-structured interviews were recorded with the consent of the PCCs. The interview questions included: (1) Did you find the program helpful? Which part of the program benefited you the most? (2) What was the most challenging aspect of completing the program? How did you overcome it? (3) What motivated you to continue with the program? (4) Would you recommend the program to other parents? (5) Would you be interested in continuing or reviewing the program in the future? and (6) Do you have any suggestions for the program?

Data Analysis

Quantitative data. All data analyses were conducted using IBM SPSS 20.0. First, we checked the assumption of normality and homoscedasticity. Next, descriptive statistics were calculated for demographics, dropout rate, frequency of adverse events, and satisfaction. To determine changes from baseline to post-intervention assessment in completers, we used a paired-sample *t* test or Wilcoxon-signed rank test, depending on the results of the first step. We conducted chi-square tests, independent-sample *t* tests, or Mann-Whitney *U* tests to examine differences in demographic characteristics and baseline measures between completers and non-completers. A 2-tailed significance level of .05 was used for all statistical analyses.

Qualitative data. Inductive content analysis was used for qualitative data.[37] Audio recordings were transcribed verbatim. Transcripts were coded and themes were refined according to codes, which were independently completed by 2 trained researchers. The number of parents who expressed similar statements and categories were calculated.

Ethical Considerations

The study was approved by the Biomedical Ethics Committee of Southern Medical University (approval no.: 2020-005). Each PCC provided written informed consent and voluntarily participated in the intervention and semi-structured interviews. Participants received a paper file with instructions on how to deal with negative emotions during practice. The intervention was delivered by a researcher certified by the National Psychological Consultant Division III and supervised by a clinical psychologist with more than 5 years of group-based mindfulness instruction experience.

Results

Participant Characteristics Before the Intervention

Among the 231 PCCs assessed for eligibility, 83 met the criteria and provided written informed consent. Of those, 34 PCCs started the program. Out of 34 PCCs, 20 completed between 66.7% and 100% of the courses and the post-intervention assessment, while the other 14 PCCs only completed 4.2% to 37.5% of the courses. The reasons for attrition included uncompleted baseline data, busy childcare, family conflict, health conditions, and feeling miserable while practicing, resulting in a dropout rate of 75.9% (Figure 1).

Of the 20 completers, the mean (standard deviation [SD]) age was 35.5 (4.4) years, ranging from 29 to 44 years, and most participants were mothers (75%). All participants were nonreligious (Table 1). Half of the children had been diagnosed with leukemia, and most (75%) were receiving treatment (Table 2).

No differences were found in either parents' or children's demographic characteristics between the 20 completers and 14 non-completers. Baseline measures showed that completers (mean = 3.27, SD = 0.49) scored higher than non-completers (mean = 2.86, SD = 0.49) on the *self-kindness* subscale of the SCS ($t = 2.42$, $p = .02$), but no differences were found in other subscale scores or total scores of baseline measures.

Effectiveness on Self-Compassion, Post-Traumatic Stress Symptoms, Depression, and Sleep Quality

We observed significant improvements in various outcome measures between baseline and post-intervention surveys. Improvements were observed in the total score of the SCS (*t*

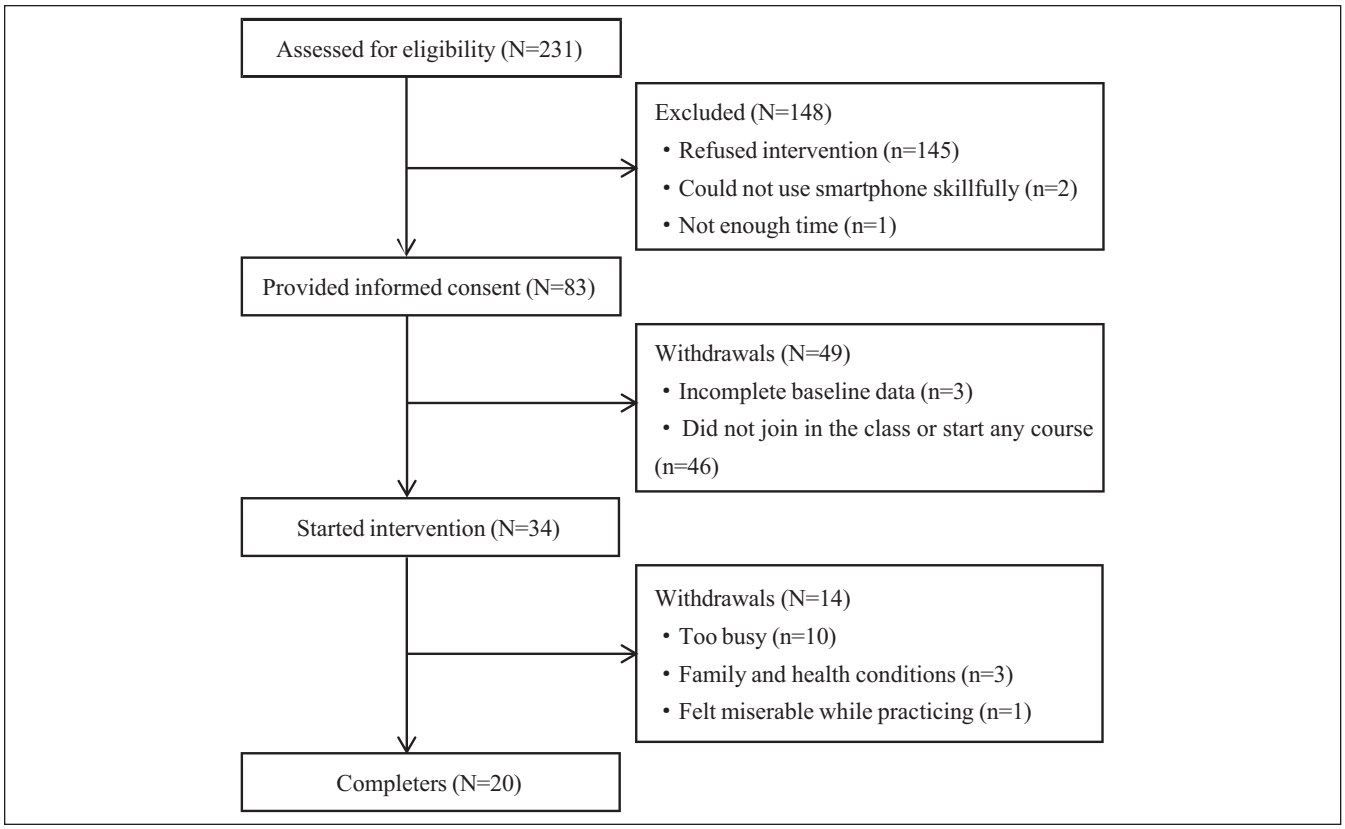

Figure 1. Flowchart of participants and dropouts.

$= -2.62$; $p = .02$), as well as the subscales of mindfulness ($t = -2.88$; $p = .01$) and overidentification ($t = -2.83$; $p = .01$). We also found significant improvements in PCL-C-re-experiencing ($t = 2.31$; $p = .03$) and PHQ-9-physical ($t = 2.39$; $p = .03$) scores. Significant decreases were noted in overall Pittsburgh Sleep Quality Index scores ($Z = -3.63$; $p < .001$), as well as the subscales of sleep quality ($Z = -4.12$; $p < .001$), sleep latency ($Z = -1.999$; $p = .046$), sleep duration ($Z = -3.473$; $p = .001$), sleep disturbances ($Z = -2.95$; $p = .003$), and daytime dysfunction ($Z = -3.79$; $p < .001$). No significant differences were found in other outcome measures (Table 3).

Adherence and Satisfaction

Of the 34 parents who started in the program, the retention rate was 54.4%. The mean score on the satisfaction questionnaire was 28, while the average scores on the latter 4 items were 3.6, 3.7, 3.5, and 3.6, respectively, all exceeding our goal of 3.

Safety

Two PCCs reported adverse effects associated with the intervention in the current study. One of them was at the early stage of their child's cancer diagnosis and withdrew after completing 3 courses due to feeling miserable about their child's diagnosis while practicing. The other reported that the content of the courses reminded her of the distressing experience at the early stage of diagnosis but was able to recover and continue practicing. There were no referrals to mental health specialists due to the timely relief.

Experience

All 20 completers were invited to participate in semi-structured interviews, with 9 consenting to participate. Seven PCCs reported feeling relaxed during practice and found the program helpful in relieving stress, adjusting negative emotions, and calming down. Some participants also reported that the program reminded them to seize the day and practice self-care, as well as seeking improved sleep quality and family ties. Four PCCs found it accessible and convenient to access resources using a smartphone. In addition, 7 PCCs expressed a strong willingness to recommend the program to others in need and to review the courses when needed in the future. In terms of suggestions for improvement, 2 PCCs suggested more in-depth explanations for each lesson, while 1 PCC suggested revising the program to make it easier to understand.

Table 1. Parents' Demographic Characteristics of Completers (N = 20).

Variable	n (%) or mean ± SD
Age, y, (mean ± SD)	35.50 ± 4.41
Relationship with children	
Father	5 (25.0)
Mother	15 (75.0)
Education level	
Junior high school	6 (30.0)
Senior high school/secondary specialized school	5 (25.0)
Junior college/college	8 (40.0)
Postgraduate or higher	1 (5.0)
Occupation	
Farmer	5 (25.0)
Civil servant/employees of enterprises and public institutions	3 (15.0)
Self-employed entrepreneurs/freelance	4 (20.0)
Unemployed	4 (20.0)
Other	4 (20.0)
Residence	
Rural	8 (40.0)
Counties and towns	5 (25.0)
City	7 (35.0)
Marital status	
Married	19 (95.0)
Single/divorced/widowed	1 (5.0)
Number of children	
1	5 (25.0)
2	12 (60.0)
≥3	3 (15.0)
Combined annual household income, RMB yuan	
<1500	3 (15.0)
1500-3000	5 (25.0)
3001-4500	4 (20.0)
4501-6000	3 (15.0)
6001-8000	1 (5.0)
>8000	4 (20.0)

Table 2. Children's Demographic Characteristics of Completers (N = 20).

Variable	*n* (%) or mean ± SD
Gender	
Male	11 (55.0)
Female	9 (45.0)
Age, y, (mean ± SD)	7.1 ± 0.77
Diagnosis	
Acute lymphocytic leukemia	5 (25.0)
Other leukemia	5 (25.0)
CNS tumors	2 (10.0)
Malignant neoplasm of the kidney	1 (5.0)
Neuroblastoma	1 (5.0)
Soft-tissue sarcomas and osteosarcoma	3 (15.0)
Other solid tumors	3 (15.0)
Time since diagnosis, mo	
<6	11 (55.0)
6-12	5 (25.0)
>12	4 (20.0)
Treatment stage	
Early stage of diagnosis	2 (10.0)
Treatment period	15 (75.0)
Relapsed and returned	2 (10.0)
Follow-up stage	1 (5.0)
Relapse status	
Yes	2 (10.0)
No	18 (90.0)

Abbreviation: CNS: central nervous system.

Discussion

Parents of children with cancer face challenges, as childhood cancer is a significant life stressor[38] and there is little research on the effectiveness of mindfulness and self-compassion-based interventions specifically for PCCs. Given the limited leisure time available to PCCs, it is worth designing intervention programs that are suitable and accessible to them. In this study, we developed a 6-week, evidence-based, internet-delivered self-help intervention program for PCCs and examined its effectiveness, adherence, satisfaction, and safety.

Consistent with a prior study on the effects of a cognitive behavioral therapy intervention for PCCs,[26] we found a positive effect on self-compassion in this study. Meanwhile, we have observed a positive effect on sleep quality resulting from the internet-based self-help MSC intervention. Improving sleep quality among PCCs can reduce their caregiver burden and distress.[14,16] The reason might be that mindfulness meditation targets multiple cognitive and emotional processes that contribute to poor sleep quality.[39] In relation to post-traumatic stress symptoms and depression, we demonstrated a significant improvement in the subscale scores of re-experiencing and physical depressive symptoms; no differences were observed in other subscale scores or the total score. Nevertheless, Shakiba et al[40] have found that cognitive-emotional interventions could significantly reduce post-traumatic stress disorder symptoms in mothers of children with cancer, while Luo et al[41] have conducted an 8-week mobile device-based resilience training in PCCs and observed a significant decrease in depressive symptoms. It is possible that the duration of our intervention was too short to produce significant results in these areas. Qualitative feedback from participants indicated that the program helped them to calm down, decrease self-judgment, and strengthen family ties. The internet-based self-help format was also well-received, as it provided convenience and avoided exposure. These findings suggest that the intervention program we developed is acceptable and effective for PCCs.

The enrollment rate for this study was 35.9%, with 62.8% of PCCs declining to participate due to reasons such as busyness, lack of interest, no demand, and inconvenience.

Table 3. Score Changes at Baseline and Post-Intervention (N = 20).

Variable	Score (mean ± SD/median [IQR])		t/Z	p
	Baseline	Post-assessment		
SCS scores				
Self-kindness	3.27 ± 0.49	3.33 ± 0.57	−0.809	.428
Common humanity	3.46 ± 0.52	3.61 ± 0.59	−1.674	.110
Mindfulness	3.44 ± 0.37	3.73 ± 0.49	−2.881	.010
Self-judgment	2.90 ± 0.50	2.89 ± 0.58	0.078	.938
Isolation	3.04 ± 0.67	3.10 ± 0.82	−0.418	.680
Overidentification	2.80 ± 0.58	3.14 ± 0.61	−2.829	.011
Total	18.91 ± 1.97	19.79 ± 2.36	−2.620	.017
PCL-C scores				
Re-experiencing	9.95 ± 2.87	8.80 ± 2.42	2.305	.033
Avoidance/numbing	12.70 ± 3.91	11.30 ± 3.37	1.510	.148
Hyperarousal	9.10 ± 3.06	9.20 ± 2.93	−0.170	.867
Total	31.75 ± 8.81	29.30 ± 7.52	1.438	.167
PHQ-9 scores				
Emotional	4.30 ± 3.44	3.20 ± 3.99	1.627	.120
Physical	2.80 ± 2.35	1.90 ± 1.80	2.392	.027
Total	7.10 ± 5.51	5.10 ± 5.56	2.084	.051
PSQI scores				
Sleep quality	1.0 (1.0)	0.0 (1.0)	$Z = -4.117$	$< .001$
Sleep latency	1.0 (1.0)	1.0 (0.7)	$Z = -1.999$	.046
Sleep duration	2.0 (2.0)	0.0 (1.0)	$Z = -3.473$	.001
Sleep efficiency	0.0 (0.0)	0.0 (2.0)	$Z = -0.726$	.468
Sleep disturbances	1.0 (1.0)	0.0 (1.0)	$Z = -2.952$	.003
Use of sleep medication	0.0 (0.0)	0.0 (0.0)	$Z = -0.000$	1.000
Daytime dysfunction	2.0 (1.0)	0.0 (1.0)	$Z = -3.787$	$<.001$
Total	8.0 (3.7)	3.0 (3.0)	$Z = -3.632$	$<.001$

Abbreviations: IQR: interquartile range; SCS: Self-Compassion Scale; PLC-C: Post-Traumatic Stress Checklist–Civilian; PHQ-9: Patient Health Questionnaire Depression Scale-9; PSQI: Pittsburgh Sleep Quality Index.

However, Ringnér et al[42] revealed that all Swedish parents require information about emotional management for themselves. To increase enrollment rates in future studies, it may be beneficial to further emphasize the benefit of MSC for emotional management in recruitment. Of the enrolled PCCs, 75.9% dropped out of the intervention overall, which was higher than the 64.5% in a study on the effect of a videoconference-based online group intervention for parents of children with life-threatening illness.[43] Meanwhile, the retention rate was 54.4% in this study. Our retention rate might be related to the lack of interaction between PCCs, which could have encouraged PCCs to continue receiving intervention with the support of peers. Further analysis revealed that noncompleters scored significantly lower than completers in subscale scores of self-kindness, suggesting that higher levels of self-kindness were linked to greater relaxation and persistence in participating in the intervention. Parents of children with cancer with higher levels of self-kindness were more likely to soothe and comfort themselves in times of distress.[44] Conversely, lower levels of self-kindness predicted lower happiness and higher anxiety,[45] indicating a greater need for intervention in these individuals.

Despite the dropout rate, participants who completed the program reported high satisfaction and acceptability, with average scores in the latter 4 items of the satisfaction questionnaire meeting criteria. Participants also expressed a willingness to recommend the program to other PCCs, indicating good satisfaction and acceptability of the program. Regarding safety, one PCC reported feeling miserable while practicing and withdrawal, which was characterized by being at the early stage of the diagnosis, and there was an ill child who died of cancer in the same unit. Another PCC recalled their experience at the early stage of diagnosis while practicing at the hospital but found it better with at-home practice. In prior studies on the compassion-focused theory-based self-help intervention[45] and the MSC program,[27] no adverse events have been observed. The characteristics of PCCs who reported adverse effects suggest that unfavorable environmental conditions may affect PCCs and lead to adverse events.

Although we delivered the intervention fully online to take advantage of the internet, the retention rate was unsatisfactory due to the time constraints faced by PCCs. Furthermore, we did not conduct follow-up assessments after the intervention,

which limits our ability to confirm its long-term effects. In addition, this study lacked a control group and relied on pre- and post-intervention measurements, making it difficult to determine whether observed effects were due to the intervention or the passage of time alone. Finally, we only recorded adverse effects when participants mentioned them weekly, which may have delayed detection and treatment. Future research is encouraged to: (1) combine online courses with offline family activities to enhance engagement and participation; (2) involve medical staff in delivering the interventions, which could potentially have increased motivation and encourage PCCs to receive the intervention; (3) involve both children and parents in the intervention, which could further motivate parents to participate; (4) conduct a randomized controlled trial with larger sample sizes and implementing frequent assessments throughout the intervention to monitor potential adverse effects and ensure timely interventions; and (5) conduct follow-up assessment to investigate the long-term effects of the intervention.

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Author Contributions

Conceptualization and design: Xiangyi Tan, Yiling Yang, and Lei Shi; Acquisition of data: Xiangyi Tan, Yuwei Zhang, and Yiling Yang; Analysis and interpretation of data: Xiangyi Tan and Yuwei Zhang; Project administration: Jinlu Chen, Ruiqing Cai, Jiangnan Meng, and Xiaofeng He; Supervision: Jiubo Zhao; Writing—original draft: Yuwei Zhang; Writing—review and editing: Xiangyi Tan, Yuwei Zhang, Yiling Yang, Lei Shi, Jiaying Huang, Jing Zhang, and Weijie Wang.

Data Availability Statement

Data are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethical Approval

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Ethics Committee of Southern Medical University (Approval No. 2020-005).

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