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RESEARCH

Effectiveness of a family-management program for family having children with acute lymphoblastic leukemia: a quasi-experimental study

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Abstract

Purpose To examine the impact of a family-management program (FMP) on family management, family, and child quality of life (QOL) among parents of children with acute lymphoblastic leukemia (ALL).

Methods Participants included 46 parents of children aged 2–5 years with ALL. Participants were recruited via a convenience sampling method at a tertiary hospital in Thailand. Twenty-three intervention participants received a 3-weekly FMP and routine care while the other 23 control participants received only routine cancer care. Data was collected in the hospital setting and/or via telephone follow-up calls. Study outcomes were evaluated at 3 time points (i.e., baseline, post-intervention, and follow-up) using the following: Family Management Measure, Beach Center Family Quality of Life Scale, and Quality of Life of Children with cancer module. Data were analyzed using two-way repeated-measures analysis of variance (ANOVA).

Results The findings revealed that family management and child QOL in the intervention group was higher than the control group at follow-up ($p < .05$), but not for family QOL. Within the intervention group, there was significant improvement in family management, family QOL and child QOL at post-intervention and follow-up.

Conclusions The FMP was effective in fostering improved outcomes among enrolled parents that received the FMP compared to parents in the control group. Healthcare providers, especially nurses that work with parents of children with ALL, can easily offer the FMP to parents to help foster optimal family management, family QOL, and child QOL.

Keywords Acute lymphoblastic leukemia · Children's quality of life · Family management · Family quality of life · Parents · Preschool children · Smart phone

Introduction

Acute lymphoblastic leukemia (ALL) is the most prevalent cancer in preschool children [1]. In Thailand, between 1000 and 1200 new cases of pediatric cancer are identified each year, with ALL accounting for more than half of all pediatric cancer cases [2]. Children with ALL are usually treated with chemotherapy which is the first choice among effective cancer treatments [3]. While undergoing cancer treatments and for everyday care needs, impacted children with an ALL diagnosis require continuous support from their parents. Parents may experience simultaneous difficulties with balancing work commitments and the care needs of a child with cancer and other dependent family members [4, 5]. The continuous chemotherapy and hospitalization needs of children with ALL often lead to increased family management of the affected child, the

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parents, and their families, which also can affect the family's quality of life (QOL) and the child's QOL.

Family QOL focuses on parents' perceptions about the level of satisfaction and comfort in their families when children are diagnosed with a potentially life-threatening severe chronic disease, like cancer. Furthermore, parents may find it very challenging to adapt to the difficult situations that their child faces during cancer progression and its associated therapies. Previous studies have provided evidence that enhancing family resources through a nursing intervention can help improve a family's QOL [6, 7]. Effective family management was also positively correlated to various aspects of a family's QOL and well-being, including emotional and physical health, and overall life satisfaction [8–10]. In addition, families with appropriated management practices tend to report higher levels of family QOL [4].

A diagnosis of ALL could have an impact on any child's QOL. The child's QOL refers to the perspective that the children have regarding how cancer and the therapies affect their comfort and daily living [11, 12]. A child's QOL should be evaluated periodically following a cancer diagnosis to ascertain how the disease has affected a child's physical function, role limitations, emotional anguish, and reaction to cancer therapies [13]. Effective family management practices are generally associated with improved health outcomes, emotional stability, social integration, and overall QOL of children with cancer [14, 15].

The Family Management Style Framework (FMSF) [16] offers a comprehensive understanding of how families deal with long-term medical illnesses and the effects of family management practices on the QOL of family members and their children. Attributes of the FMSF include the following: definition of the situation; management behaviors; perceived consequences; family focus; parental mutuality; and family cohesion and adaptability. These attributes are critical factors to evaluate the QOL of affected children and families and the effectiveness of their family management. Tailored interventions are needed to empower families to better manage a child with a chronic disease and to enhance the general QOL of parents by ongoing evaluation of these critical factors.

To date, there is a gap in published findings focused on the impact of delivered family-focused interventions on parents of chronically ill children, especially among families of children with cancer. The FMP described in this study should help to empower parents of children with ALL to manage their family environment properly. This FMP tenet is supported by published findings that have provided valuable insights about the impact of family-focused interventions designed to help improve the family management skills of parents and the QOL of children with chronic illnesses and their family members.

In one study by Fedele et al. [17], the results provided evidence that parent intervention decreased internalizing and externalizing symptoms in children. The sole effect that was mediated by improved maternal QOL and decreased mother's distress was the internalizing symptoms that impacted affected children. The QOL for children, families, and family management were all impacted by the intervention that was given to the families [4, 18]. Similarly, investigators in another study reported that the evaluation of a support focused nursing intervention for child cancer and their family caregivers provided evidence that the intervention reduced the stress in the child's caregivers and enhanced the child's QOL and ability to cope [19]. Families with children who have a chronic illness that practice appropriate family management strategies tend to have high QOL [4, 17, 19–21]. Yet, specific interventions for families with children with ALL were not found in previous published reporting of study outcomes.

Previous family-focused interventions for parents with chronically ill children or cancer had a long period of implementation, ranging from 7 weeks to 6 months [20–23]. In addition, investigator use of a technology-tailored intervention through a smart phone should provide to be easier to use by family members and more effective than evaluating interventions using printed copies of parent information when delivering and evaluating family focused health education [24]. Unfortunately, there is still a gap in published reports about the evaluation of nursing interventions to improve family management skills and family and child QOL among families of children with ALL.

In this study, a FMP was designed by the investigators for the purpose of evaluating the impact on parents' ability to manage family demands and care of children with ALL. In this study, family management was the primary outcome evaluated. The QOL of parents and children with ALL were the secondary outcomes evaluated. Our study team aimed to determine effectiveness of our FMP intervention by evaluating planned outcomes. Hence, we hypothesized that:

H1: After receiving the FMP, parents in the intervention group would have increased family management skills and parent QOL at post-intervention and follow-up periods.
H2: Parents would perceive their child had increased QOL compared to participants in the control group at post-intervention and follow-up data collection time periods.
H3: Within the intervention group, family management, family QOL, and child QOL would be increasing at post-intervention and follow-up data collection time periods.

Method

Study design

This study employed a quasi-experimental design with two-group repeated measures ANOVA.

Participants and setting

The study was conducted at a tertiary hospital situated in the eastern region of Thailand from November 2023 to March 2024. Out-patient cancer evaluations and treatments are provided to pediatric patients with cancer in this pediatric oncology clinic in Thailand.

Participants were parents of young children aged between 2 and 5 years and were diagnosed with ALL and currently receiving chemotherapy at the approved hospital setting. Parent inclusion criteria included (a) consenting to participate by a mother or father of an eligible child; (b) being the primary parent caregiver of a child with ALL and aged from 2 to 5 years; (c) owning a cell phone with internet coverage and able to use it; (d) having at least one extra support relative committed to be at the hospital site during FMP sessions for each eligible parent; (e) being able to attend all FMP sessions; and (f) being able read and speak the Thai language. The exclusion criteria were parents who are unable to commit to attend all planned FMP sessions; have a child with a relapsed type of ALL or had received a bone marrow transplant; have any visual or cognitive deficits; and/or decline consenting to participate.

Sample size

A sample size was calculated using G*power software [25] for 2-way repeated measures ANOVA. It was determined with an effect size of 0.22 [22], a significant level value of 0.05, and the power of the test of 0.80. The computation revealed a minimum sample of 36 parents plus allowing for an attrition rate of 25% [26]. Therefore, a total sample of 46 parents was required. Enrolled parents were then split equally into a sample size of 23 in each of the two groups (intervention and control).

Sample recruitment

Two research assistants (RAs) recruited and verified eligible participants for both arms using a convenience sampling technique based on the study's inclusion criteria. The RAs were two registered nurses that had 2 years or more experience in a pediatric clinic and obtained a certificate in oncology nurse practitioner training. One RA was responsible for recruiting participants and collecting data at baseline (T1). The other RA was responsible for collecting participants' responses at post-intervention (T2, and follow-up period (T3). The study flow of participants for each arm is shown in Fig. 1.

Ethical considerations

The study protocol and all research instruments were approved by the Ethics Committee of Burapha University, Thailand (IRB3-112/2565), and Chanthaburi Research Ethic Committee/Region 6, Prapokklao Hospital, Thailand (Certificate of Approval (COA) no 082/65). Throughout the study, all approved study procedures were conducted according to protocol and to adhere to the principles of the Declaration of Helsinki.

Summary of the FMP intervention

The FMP was developed by the study team and guided by the FMSF [16], the Building on Family Strengths program [22], and reviewed related literature. The program focused on the promotion of parents' ability to manage and take care of children with ALL (aged 2–5 years) and their families in three sessions over 3 weeks. Each session offered a video presentation that the participants could view using a QR code on their computer or mobile device. And each session's duration was from 40 to 50 min. A brief presentation, a discussion with participants, completed worksheets, and a reflection comprised the action plans that were created for enrolled parents in the intervention groups (e.g., two to three participants remained together for all three sessions). In the first session, the participants learned about ALL in children and how a diagnosis of ALL may affect the child diagnosed, their siblings, and other family members. Family management guidelines for parents of children with ALL was covered in the second session. Lastly, the third session encompassed emotional considerations and recommendations for parents managing a child with ALL at home, including improved family relationships and communication among parents and the children. Details of the FMP can also be found in a published study of Aungkaprasatchai et al. [27].

Materials used in the FMP consisted of three VDO clips (one VDO per session), which could be accessed/viewed via prepared QR codes, and printed worksheets (parent-action plans). The QR codes were later scanned and VDO clips were installed onto the participants' smart phones to re-watch and self-study at home. The first VDO reviewed common experiences and emotions experienced by parents of young children with ALL and how their responses may impact affected children and other family members. Viewing of the first VDO involved about 8.07 min. The viewing time for the second VDO was

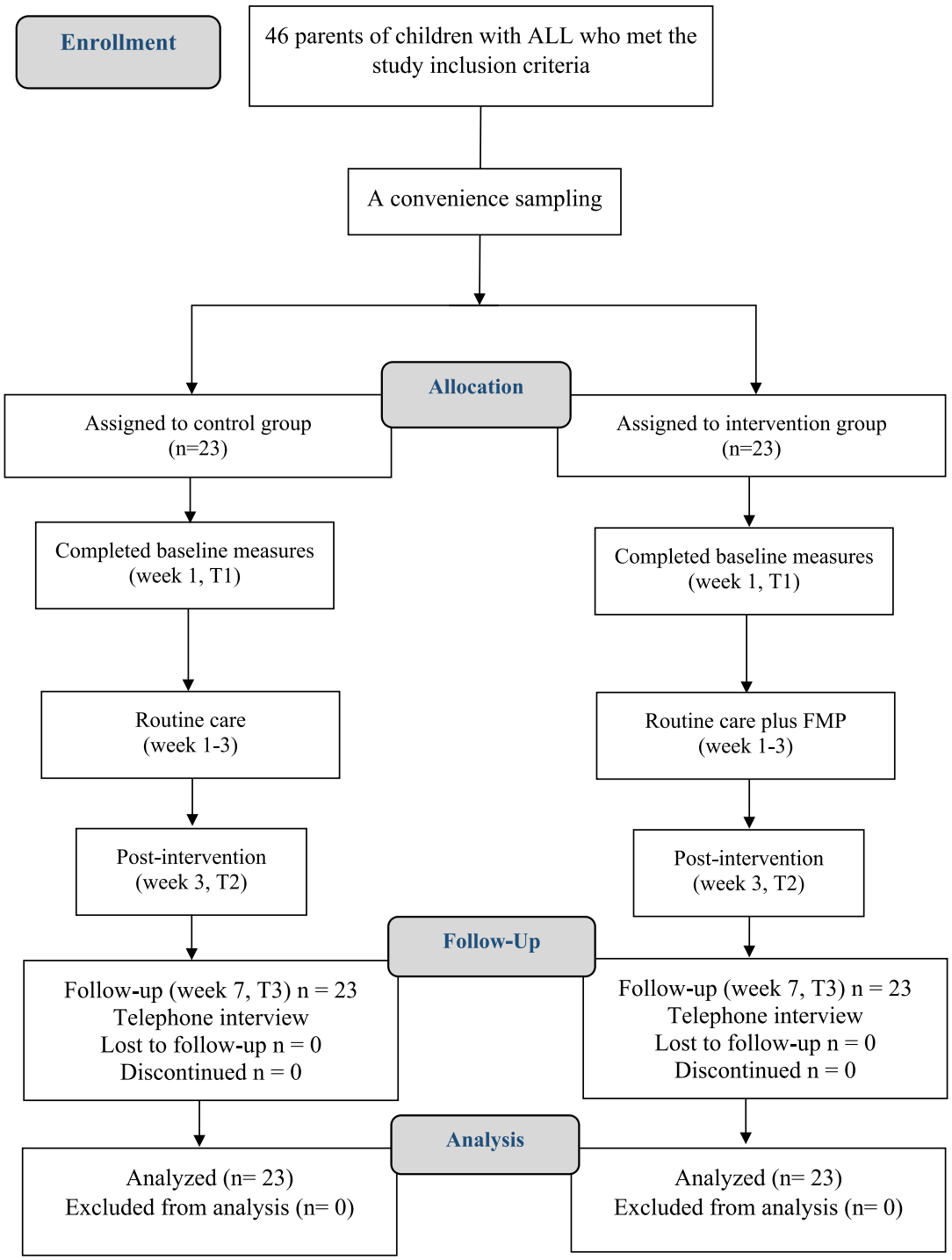

Fig. 1 Flow of participants through each stage of the study

about 7.17 min. The second VDO provided a review of how family relationships and communication can be used to promote and build family management skills of parents in the care of a child with ALL. The viewing for the final and third VDO was about 4.51 min. The third VDO focused on providing education on parent skills to help improve family management in the care of a child with ALL. The third VDO also provided parent education on how their emotional responses can affect the ill child and other family members.

Summary of the routine cancer care

The routine cancer care was delivered by a pediatric nurse in the hospital or out-patient clinic areas. Pediatric nurses in these areas are responsible to provide parent education to help parents understand their child's ALL diagnosis, recommended cancer treatments, expected side effects, and supportive care available for a child receiving chemotherapy.

Research instruments

The Family Management Measure (FaMM) was developed by Knafl et al. [28], and is also available in the Thai printed language. The FaMM was designed to measure how parents manage caring for a child with a chronic condition/illness and the extent to which parents incorporate condition management into their everyday family life. The FaMM includes 53 items and each item is formatted with 1-to-5 response options. The possible total score can range from 53 to 265. A higher score corresponds to better family management and a lower score represents less family management. The FaMM's Cronbach's alpha was 0.70 in this study.

The Beach Center Family Quality of Life Scale (BCFQOLS) was developed by Hoffman et al. [29]. This scale was designed to evaluate how satisfied participants are with different aspects of their family's QOL. This scale includes 25 items and each item is formatted with 1-to-5 response options. The possible total score can range from 25 to 125. A higher score indicates higher family QOL, and a lower score refers to less family QOL. Additionally, the owner of the BCFQOLS granted the PI permission to translate this scale into the Thai language. The Thai version of BCFQOLS had a Cronbach's alpha of 0.98.

The Pediatric Quality of Life Inventory (PedsQL) Measurement Model was developed by Varni et al. [30] and is also available in the Thai language. This model is designed to evaluate the parent's perception of symptoms experienced by their child with cancer on the day of evaluation and during the past 7 days. This model contains 25 items with a 5-point rating option. The total possible score range of scores for this model is from 0 to 100. A higher score indicates a better child's QOL, and a lower score shows a lower child's QOL. The PedsQL had a Cronbach's alpha of 0.90 in this study.

Additionally, the PI of this study obtained permission to use all data-collection instruments from the tools' owner(s) prior to the start of data collection.

Data collection procedures

First, the PI met with the head nurses at the approved hospital setting, to explain the research objectives and the data-collection procedures, and to seek permission to use a private room on the hospital ward for the intervention group. During the intervention sessions, the children were then looked after by a committed relative to allow the enrolled parent to participate in all study sessions. Each session was carried out in a small group (2–3 parent participants per group) and met once a week for 3 weeks consecutively. The parents in the intervention group participated in all sessions and activities (e.g., watching videos; learning from demonstration and discussion; and completing study worksheets). Next, enrolled parents were asked to complete a writing plan of action (i.e., after returning home to write a daily brief note about their activities). After completion of the FMP, the PI made appointments with parent participants for follow-up and evaluation at 4 weeks by telephone interview**.** Enrolled parents in the intervention group received the FMP and routine cancer care by the child's oncology providers and nurses. In comparison, parents in the control group only received routine cancer care.

Data analysis

The statistical significance level was set at $p < 0.05$ using SPSS version 26.0 to analyze the data. Descriptive statistics were computed to describe the characteristics of participants and all outcomes. The two-way repeated measures ANOVAs were run to determine differences in mean scores of the outcomes. The simple main effects were tested after the finding of a significant of interaction effect.

Results

Attendance and attrition

A total of 46 participants were enrolled. There were no participant (parent or support relative) withdrawals during any of the protocol activities. After testing all assumptions for subsequent statistical analyses, there were no detected outliers. Figure 1 shows the participants' recruitment, allocation, and analysis.

Demographic information

The participants' characteristics were summarized and planned comparisons were completed between the two groups, and no differences were found (Table 1).

Descriptive statistics of outcomes at three-time measures

The scores of the means and standard deviations of the total scores of data collection measure (i.e., for family management, family QOL, and child QOL) for both the intervention

Table 1 Characteristics of the participants in the intervention and control groups

Characteristic	Intervention group ($N=23$)		Control group ($N=23$)		t	χ^2	p
	Number	**Percent**	**Number**	**Percent**			
Parents Age (years)	$M=32.65$ ($SD=8.77$, range 22–52)		$M=30.13$ ($SD=8.07$, range 19–50)		−1.015		.251
Education < Bachelor degrees	19	82.6	18	78.3		.138	.710
≥ Bachelor degrees	4	17.4	5	21.7			
Occupation Government	2	8.7	0	0		.352†	.385
Private company	1	4.3	8	34.8			
Own business	4	17.4	0	0			
Employee	10	43.5	10	43.5			
Housewife	6	26.1	5	21.7			
Parents' living status Cohabitated	20	87.0	20	87.0		.223†	.353
Separated/divorced	3	13.0	1	4.3			
Single	0	0	2	8.7			
Relationship with children Father	4	17.4	6	26.1		.475†	.722
Mother	19	82.6	17	73.9			
Child gender Boy	11	47.8	11	47.8		1.000†	1.000
Girl	12	52.2	12	52.2			
Age (months)	$M=45.87$ ($SD=10.70$, range 24–60)		$M=51.17$ ($SD=8.98$, range 32–60)		1.821		.741
Duration of treatment (months)	$M=31.61$ ($SD=10.13$, range 18–60)		$M=28.48$ ($SD=7.63$, range 12–36)		−1.184		.385

t = independent t-test; χ^2 = chi-squared; † = Fisher's exact test

and control groups according to three-point times are presented in Table 2.

Primary outcome: family management

Comparing family management between the 2 groups showed a significant interaction effect ($F_{1.46,64.19}=13.132$, $p<0.05$, $\eta 2p=0.230$) (Table 3). The results showed a significant difference between the two groups at follow-up period (T3) ($F_{1,44}=7.92$, $p<0.05$, $\eta 2p=0.153$), but not at T1, and T2 (Fig. 2 (a)).

For within group, there was no significant difference between time-measures in the control group. However, there was a significant difference among the three times points ($F_{2,44}=15.81$, $p<0.05$, $\eta 2p=0.418$) in the intervention group. The score of family management at follow-up (T3) was significantly higher than that at baseline (T1), and post-intervention (T2) (T3 vs. T1: $M_{diff}=13.391$, and T3 vs. T2; $M_{diff}=11.391$, $p<0.05$), but not between T2 vs. T1 (Fig. 2 (a)). These findings showed that after receiving the FMP, participants in the intervention group had better family management than that in the control group and could maintain this effect over time.

Table 2 Means and standard deviations of the study outcomes for the intervention and the control group among three time measures

Outcome	Week	Time measure	Intervention ($N=23$)		Control ($N=23$)	
			M	***SD***	***M***	***SD***
Family management	1	1	175.22	12.81	178.26	12.81
	3	2	177.22	9.30	177.87	12.53
	7	3	188.61	9.51	179.00	13.33
Family quality of life	1	1	97.65	16.63	100.70	16.70
	3	2	92.30	14.70	99.35	16.81
	7	3	103.30	8.48	99.30	16.33
Child quality of life	1	1	68.52	18.46	69.26	15.62
	3	2	62.48	15.47	70.48	16.29
	7	3	78.30	13.88	69.57	15.49

Table 3 Two-way repeated measures ANOVAs of total score of family management, family quality of life, and child quality of life

Source	*SS*	*df*	*MS*	*F*	*p*-value	η2*p*
Family management						
Between subject						
Group	134.03	1	134.03	0.427	0.517	0.010
Error	13.804.52	44	313.74			
Within subject						
Time	1376.36	1.46	943.32	17.393	< 0.001	0.283
Time* group	1039.15	1.46	712.20	13.132	< 0.001	0.230
Error time	3481.83	64.19	54.24			
Family quality of life						
Between subject						
Group	142.03	1	142.03	0.24	0.626	0.005
Error	25.945.88	44	589.68			
Within subject						
Time	701.623	1.7	412.13	6.57	0.004	0.130
Time* group	719.014	1.7	422.35	6.73	0.003	0.133
Error time	4702.029	74.91	62.77			
Child quality of life						
Between subject						
Group	0.000	1	.000	0.000	1.00	0.000
Error	28,484.58	44	647.38			
Within subject						
Time	1376.36	2	665.92	11.73	< 0.001	0.210
Time* group	1039.15	2	810.28	14.27	< 0.001	0.245
Error time	3481.83	88	56.77			

η2*p* = partial eta-squared

Secondary outcomes: family quality of life (FQOL) and children's quality of life (CQOL)

The results presented significant interaction effects for FQOL ($F_{1.7,74.91} = 6.73$, $p < 0.05$, η2$p = 0.133$), and CQOL ($F_{2,88} = 14.27$, $p < 0.05$, η2$p = 0.245$) (Table 3).

There was no difference of FQOL mean scores between the intervention and the control groups at all time points ($p > 0.05$). The results provide evidence that participants in the intervention and the control groups had no difference in FQOL after receiving the FMP. For within group, in the control group, no significant difference was found. However, in the intervention group, FQOL mean scores among the three times points were significantly different ($F_{2,44} = 7.08$, $p < 0.05$, η2p = 0.243). The scores at follow-up (T3) was significantly higher than that at post-intervention (T2) (T3 vs. T2: $M_{diff} = 11.00$, $p < 0.05$) (Fig. 2 (b)), but no difference between T2 vs T1, and T3 vs T1. This finding indicates that participants who received the FMP had better FQOL at the follow-up period. The graph in Fig. 2 (b) depicts that the FQOL mean scores in the intervention group gradually decreased and also increased somewhat after completing the intervention and continued to rise sharply at the follow-up time.

For the CQOL, there was a significant difference found in the mean scores between the intervention and the control group at follow-up (T3) ($F_{1,44} = 4.06$, $p < 0.05$, η2$p = 0.08$). This result indicates that after receiving the FMP at the follow-up period, the CQOL in the intervention group was better than that in the control group. When comparing within the intervention group, the CQOL mean scores at follow-up (T3) were significantly higher than that at baseline (T1), and post-intervention (T2) (T3 vs. T1: $M_{diff} = 9.78$, $p < 0.05$, T3 vs. T2; $M_{diff} = 15.83$, $p < 0.05$). But there was no difference between T2 vs. T1. The participants who received the FMP perceived better CQOL over time. For the control group, there was no pair of time difference. The graph demonstrated that the intervention group's CQOL mean scores increased modestly following the intervention at the follow-up time, while the control group's CQOL mean scores steadily declined (Fig. 2 (c)).

Discussion

We aimed to examine effectiveness of the FMP by comparing the outcomes of family management, FQOL, and child QOL between parents of children with ALL receiving

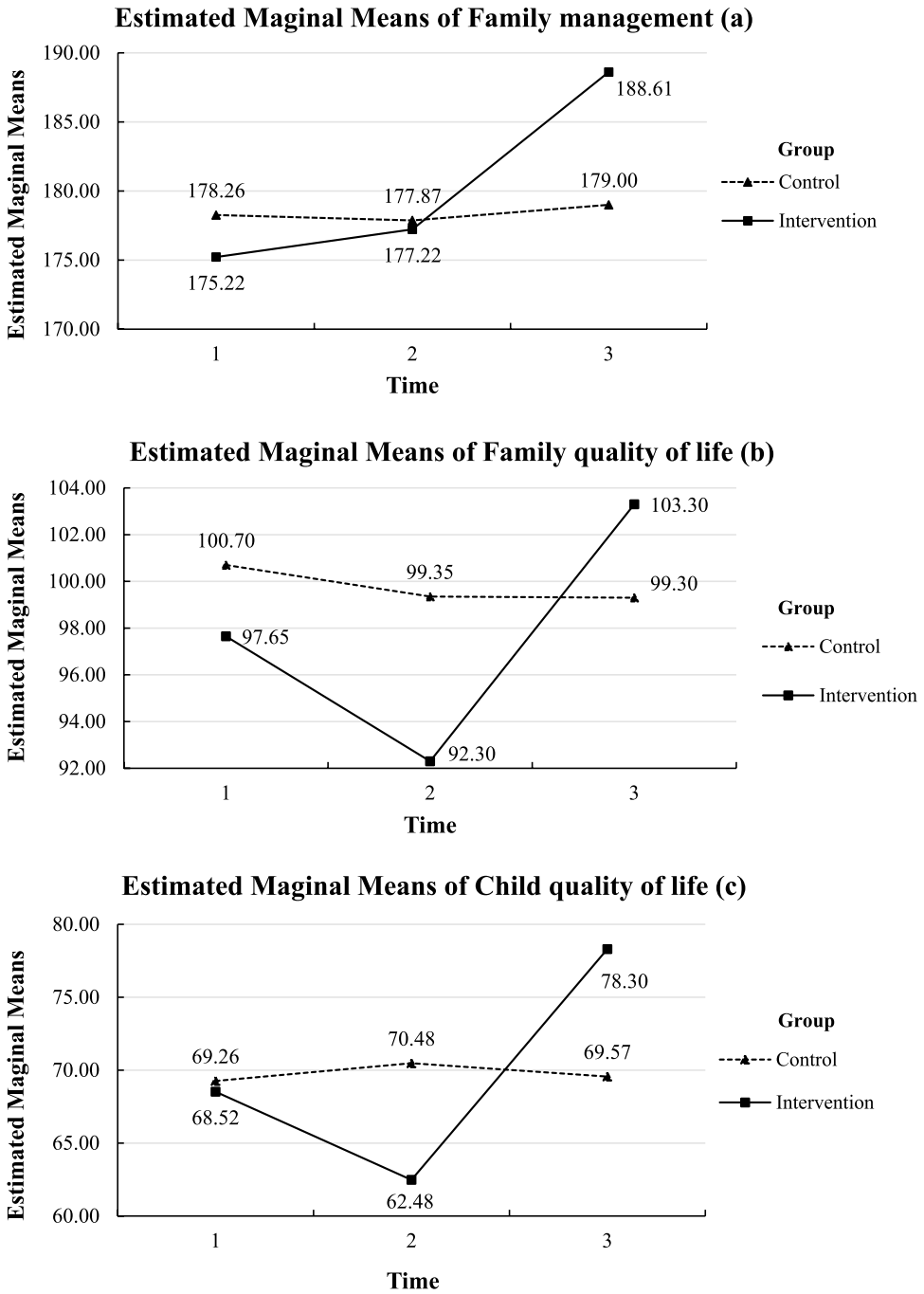

Fig. 2 Graph trend of family management, family quality of life, and child quality of life

the FMP and routine cancer care compared to parents in the control group that only received routine cancer care at post-intervention and at the follow-up time period. We also compared the outcomes within the participants receiving the FMP and routine cancer care at post-intervention and at the follow-up time period for any changes. The findings revealed effectiveness of the FMP in that after receiving the program, participants in the intervention group had significantly greater family management and higher CQOL than the parents in the control groups at the follow-up period, but not for the FQOL. Our first hypothesis was partially supported while the second hypothesis was fully supported. For within the intervention group, the mean scores of family management, FQOL, and CQOL were higher when time changed. These findings confirmed our third hypothesis.

As expected, family management of participants in the intervention group was greater than that in the control group, increasing overtime. According to the FMSF, family management among parents of children with chronic diseases would be promoted when parents used appropriate family

management practices and management in the family [16]. This study finding is congruent with findings reported by Mai and Chaimongkol [9] that their intervention helped to improve the family management of children with autism among parent participants that received their intervention. Their family-management intervention also assisted the parents in identifying target areas for either supporting good management or increasing self-identified parts of management and refer to FQOL and CQOL. This would allow them to examine the strengths and potential problem areas in their families [31].

Parents must develop and maintain emotional resilience to cope with their child's diagnosis, treatments, and the uncertainty of responses to treatments. The families of children with ALL employ strategies to deal with difficulties in terms of psychological, physical, and practical demands of the disease [16, 31]. The relevance of family management practices among parents at different time points when comparing the intervention and control groups provide evidence to suggest the planned duration of the observation period in behavioral research is important to carefully plan. For instance, including a shorter protocol delivery time period may not capture the full extent of parent response changes. In comparison, including longer protocol delivery periods may allow for the stabilization and reinforcement of new parent behaviors and may prove to show significant differences.

Investigators in other studies have evaluated the impact of chronic illness on the QOL of children and their families. Their findings have also shown that chronic illnesses can have a significant impact on various aspects of a child's QOL, especially children with cancer [10, 14, 32–34]. Cognitive, social, emotional, and physical aspects can all be impacted by these consequences. In all family management style framework dimensions, the demands of the parents in this study were taken into consideration when designing the FMP. At data collection time point numbers 2 and 3, families of children with ALL reported a better child QOL than they did before receiving the FMP intervention. The enrolled parents in our study who were the child's major caregivers during cancer treatments evaluated their child's QOL, contributing to the study findings based on their own perspectives. Our study findings provide evidence that the FMP sessions had a positive impact resulting in parents perceiving their child had improved QOL.

The results in our study showed no significant difference among the three time points between the two parent groups related to FQOL responses. However, within the intervention group, the follow-up period (T3) had a higher mean score of FQOL than that at the post-intervention (T2). This finding suggests that the quality of life for families improved after receiving the FMP. The parents received knowledge and information about the impact, family relationships, communication of families, and guidelines to manage the children with ALL from the FMP.

Understanding the challenges parents face and the most effective strategies to support them is made possible by doing research on the quality of life of parents of children with a cancer diagnosis. Previous studies reported that nursing interventions had a positive impact on FQOL among parents of children with ALL [6, 35]. The quality of life and well-being of families, including their physical and mental health as well as their general level of happiness with life, were all favorably connected with effective family management and had a positive influence on QOL [8–10]. When parent skills are used over an extended length of time and after receiving another sort of intervention, FQOL has a better likelihood of improving [35, 36]. Our findings were similar to other studies [6, 9, 34, 35]. The impact of these family-focused studies is growing and encourages better family management practices.

Our findings contribute to the importance of supportive care that is focused on parents of children with ALL through activities provided in our FMP intervention that can help to increase family management skills, FQOL, and CQOL. Our team proposes that integration of technology into the delivery of our FMP intervention may prove to help parents in other studies and to clinically have more convenient access to FMP resources. Thus, the FMP holds promise for advancing interventions in pediatric oncology.

Strength and limitations

Several strengths can be identified. Participants included both mothers and fathers of children with ALL who were the primary caregiver. Additionally, none of the enrolled parents withdrew from the study. The findings also contribute to the limited research on parents of children with cancer in Thailand. Additionally, our FMP intervention included current technology using scanned QR codes and installed VDO clips that allowed parents convenient access to watch provided video clips from their own smartphone and also empowered parents to view the video clips at their convenient time in their family schedule.

However, there are also limitations. The sample size was small and a small number of fathers participated. Although, the likelihood of statistical error will decrease with a greater sample size. This study involved rare diseases like childhood cancer, ALL, where the statistical rarity of the condition naturally limits the pool of eligible individuals. This limitation is frequently unavoidable. The participants were not recruited using a random sampling technique. The study was also conducted at only one setting in Thailand. The enrolled parents had a young child with ALL receiving standard

treatments and no complications. Thus, the generalizability of the study findings should be interpreted with caution.

Implications and recommendations

The FMP is an effective approach to help parents improve family management skills and the QOL of children with ALL. Future investigators may consider planning a study design with a longer duration for follow-up collection of the study outcomes, especially family QOL. Our study team also recommends the success and sustainability of the family-management program should include a combined intervention of parent group discussions and an online social media platform.

Conclusions

The results provided promising evidence that the accessibility and effectiveness of the FMP resulted in a positive impact on improving the parents' family management skills and improving their child's quality of life. Health care providers could utilize the FMP to provide supportive care for parents and their young children with ALL.

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Author contribution W.A. and N.C. conceptualized the study, prepared Fig. 1–2 and Table 1–3, and analyzed the data. W.A., N.C., and V.L.H. designed methodology, and wrote the main manuscript text. All authors reviewed the manuscript.

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Data availability No datasets were generated or analysed during the current study.

Declarations

Competing interests The authors declare no competing interests.

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