Feasibility and Acceptability of Multidisciplinary Group Psychoeducation for Family Members of Adolescent Patients with Anorexia Nervosa

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Introduction : Anorexia nervosa (AN) among adolescents places a substantial psychological burden on families. Although psychoeducation may offer support, evidence from Japan is limited. This single-arm pilot study evaluates the feasibility of a group psychoeducation program and its preliminary effects on caregivers' depressive symptoms and family functioning.

Methods : We recruited families of adolescents with AN from Shinshu University Hospital. Participants attended four weekly group psychoeducation sessions led by multidisciplinary clinicians. Feasibility was assessed using dropout rates and feedback. Depressive symptoms, quality of life (QOL), and family function were evaluated using the Quick Inventory of Depressive Symptomatology, MOS 36-Item Short-Form Health Survey (SF-36) and Family Adaptability and Cohesion Evaluation Scale at Kwansei Gakuin IV-16 (FACESKG IV-16), respectively, and adolescents' percentage of ideal body weight (%IBW) was assessed, pre- and post-intervention. Qualitative feedback was analyzed thematically.

Results : Of the 16 family members enrolled, 13 completed the program (19 % dropout). The adolescents' %IBW changed insignificantly. Family members reported small reductions in depressive symptoms and slight improvements in several SF-36 domains, whereas family cohesion in FACESKG IV-16 shifted toward a more adaptive pattern. Understanding of AN increased significantly, and qualitative feedback indicated improved knowledge and reassurance.

Conclusion : Group psychoeducation for families of adolescents with AN was feasible and acceptable. Although clinical improvements were modest, families exhibited slight improvements in QOL, more adaptive cohesion, and increased understanding of AN. These preliminary findings support the potential value of structured psychoeducation and highlight the need for larger, controlled studies. *Shinshu Med J 74 : 183—192, 2026*

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Key words : anorexia nervosa, family, psychoeducation, adolescent

I Introduction

Anorexia nervosa (AN) is an eating disorder characterized by persistent energy intake restriction, intense fear of gaining weight or becoming fat, persistent behavior that interferes with weight gain, and distorted self-perceived weight or shape[1)]. Recently, AN among adolescents has increased, particularly following the coronavirus disease (COVID-19) pandemic[2)3)].

Caregivers of patients with eating disorders experience substantial burden, and increased anxiety and depression[4)5)]. They may suffer from thoughts of their

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children's possible death owing to unhealthy weight loss and distress associated with managing additional physical symptoms. Family members are eager to "do something about it." Moreover, they feel exhausted following repeated conflicts with the child. Caregivers of patients with an eating disorder usually suffer from mental health difficulties, psychological distress, and burden[6)7)]. Furthermore, eating disorders were once considered familial illnesses. To date, some families hold such beliefs and harbor self-blame. Caregiver accommodation and depressive symptoms in both caregivers and patients contribute to maintaining psychopathology in adolescents with AN[8)]. Caregivers' depressive symptoms are clinically important because they have been linked to poor family functioning and less effective support for the adolescent[9)]. Therefore, it is necessary to actively provide support, because families of adolescents with AN report struggles with finding help[10)].

Given the challenges faced by families, family functioning is increasingly being explored in the context of eating disorders, with several studies focusing on patients with eating disorders, including adolescents with AN[11)]. Results showed that family functioning among families of children with eating disorders has deteriorated, indicating the need to consider interventions that target not only individual family members but also family functioning[11)]. Previous studies show that family psychoeducation positively affected adolescents' weight gain and family functioning[5)12)]. Additionally, family psychoeducation has been suggested to enhance the understanding of the disease, related coping skills, and the cooperative relationship between the patient, family, and health care provider[13)].

However, research on psychoeducation for families of adolescents with AN in Japan is scant. Several Japanese studies document the substantial burden, psychological distress, and depressive symptoms experienced by caregivers of individuals with eating disorders[14)15)]. Nevertheless, evidence regarding the effectiveness of psychoeducation in reducing caregivers' depressive symptoms remains scarce. Moreover, research on structured psychoeducation for families of adolescents with AN, and evidence of how family functioning changes in response to psychoeducational interventions are scarce.

Previous research also highlights factors such as coping style, time spent with the patient[14)], and social support as factors influencing caregivers' mental health[15)]. Additionally, a recent pilot RCT protocol has proposed a remote family education program aimed at improving caregiver well-being, underscoring the growing need for family focused interventions in Japan[16)]. Although these findings highlight the importance of supporting caregivers, the extent to which family based interventions can reduce caregivers' depressive symptoms remain unclear[7)].

To address these gaps, this study examines the feasibility and acceptability of a group psychoeducation program for families of adolescents with AN, and explores its potential impact on families' depressive symptoms and family functioning. This study was conducted in preparation for a future randomized controlled trial.

Ⅱ Methods

A Study design

This single-arm pilot study was conducted at Shinshu University Hospital in Nagano, Japan. All procedures complied with the Declaration of Helsinki and Ethical Guidelines for Medical and Health Research Involving Human Subjects. This study was approved by the ethics committee of Shinshu University School of Medicine (study no. 4524).

B Participants

Given the exploratory nature of this feasibility study, the target sample size was determined pragmatically based on the expected number of eligible patients during the study period. We recruited 16 parents and grandparents, including 13 mothers, one father, one grandmother, and one grandfather. They were caregivers of 13 adolescents under 19 years old who had a clinical diagnosis of AN according to the DSM-5 criteria at the Department of Pediatrics, Department of Psychiatry, and Mental Health Clinic for Children at Shinshu University Hospital between December 2020 and March 2023. All participants signed a consent form.

Table 1 Themes and lecturers of sessions

Session	Theme	Lecturer
1	What is anorexia nervosa?	Psychiatrist
2	Process and treatment of anorexia nervosa	Occupational therapist
3	Nutrition and meal	Dietitian
4	Supporting families to work together effectively	Child psychiatrist

C Interventions

The participants underwent four weekly group psychoeducation sessions over a four-week period, with each lasting 60 minutes. Each session was structured into two components : a lecture in the first half and a free conversation in the second half. An occupational therapist served as the primary facilitator across all sessions and also acted as a lecturer. A child psychiatrist, a registered dietitian, and a clinical psychologist participated as lecturers or co-facilitators depending on the session (see **Table 1** for details). The lecturers for sessions 2 to 4 were fixed and consisted of a child psychiatrist, a registered dietitian, and an occupational therapist, all of whom were routinely involved in the clinical care of adolescents with AN. In contrast, the physician leading session 1 differed across program cycles ; however, the same standardized materials were used for all lectures. In addition, the same child psychiatrist and occupational therapist consistently participated in the free conversation of each session. Together, these procedures were implemented to maintain consistency and ensure the overall quality of the intervention. The first session involved a specific description of AN symptoms, including mental and physical changes. The second session involved describing the progress and treatment of AN. The third session involved specific knowledge about nutrition and advice about meal preparation. The fourth session used an animal metaphor[17] to help families understand parent-child interaction patterns, drawing on a metaphor-based psychoeducational approach to provide guidance on improving these interactions.

Ⅲ Materials and Methods

A Measures

1 Demographic information of adolescents

Information regarding the adolescents' age, sex, weight, and height was obtained from medical records. We recorded whether the adolescent was being treated as an inpatient or outpatient, and whether they were on tube feeding. Adolescents' percentage of ideal body weight (%IBW) was measured before and after group psychoeducation.

2 Demographic information of families

The age and sex of participating family members were obtained from the questionnaire.

3 Feasibility and acceptability

Feasibility and acceptability were assessed based on dropout rate and participants' feedback.

4 Families' mental function

We used the Quick Inventory of Depressive Symptomatology (QIDS-J)[18] to assess depressive symptoms among family members pre- and post-intervention. The severity of depression was rated using a total score (0-27) comprising items on sleep, appetite/weight, psychomotor function, and six more. Scores of 0-5, 6-10, 11-15, 16-20, and 21-27 indicated normal, mild, moderate, severe and very severe depression, respectively.

We used the MOS 36-Item Short-Form Health Survey (SF-36)[19][20] to assess the health-related QOL of families pre- and post-intervention. The standard value for the Japanese population was set at 50, and comprised eight subscales : "Physical functioning (PF)," "Role physical (RP)," "Bodily pain (BP)," "General health (GH)," "Vitality (VT)," "Social functioning (SF)," "Role emotional (RE)," and "Mental health (MH)". The summary scores for each of the three components are referred to as the "Physical Component Summary (PCS)," the "Mental Component Summary (MCS)," and the "Role/Social Component Summary (RCS)."

5 Family functioning

We used the Family Adaptability and Cohesion Eval-

uation Scale at Kwansei Gakuin IV-16 (FACESKG IV-16)[21] to assess family functioning between pre- and post-intervention. The FACESKG IV-16 is a self-report instrument comprising 16 questions. It captures the relationship between "cohesion" (psychological and social distance between family members), "adaptability" (the ability to flexibly change the marital and family system in response to changing circumstances, and the change and growth of family members), and the level of family functioning.

Cohesion : "Disengaged" (-2 or lower), "Separated" (-2 to 0), "Connected" (0 to 2), "Enmeshed" (score over 2).

Adaptability : "Rigid" (-2 or lower), "Structured" (-2 to 0), "Flexible" (0 to 2), "Chaotic" (score over 2).

6 Qualitative assessment

Qualitative assessment was conducted using a questionnaire adapted from Suzuki et al.[13]. The first question asked participants to rate their understanding of AN pre- and post-intervention. They were asked to select a number between 1 and 10, with 1 indicating no knowledge, and 10 indicating full understanding.

The pre-questionnaire contained two open-ended questions including "What do you want to hear and expect from psychoeducation?" and "What concerns or problems do you have about the future?"

The post-questionnaire asked about satisfaction with the program, which participants rated on a 5-point scale, ranging from "Very Satisfied" to "Very Dissatisfied." It also included two open-ended questions including "reason for satisfaction" and "feedback and concerns."

B Analysis

We used Cohen's d to calculate the effect size of differences in %IBW pre- and post-intervention. The QIDS-J score, SF-36 items, and FACESKG IV-16 items were analyzed using a t-test for normally distributed items and Wilcoxon's signed rank test for non-normally distributed items. For effect sizes, d and r were calculated. We used IBM SPSS Statistics 29 for Windows (IBM Corp., Armonk, NY, USA) for all analyses. Statistical significance was set at $p < 0.05$.

Free-comment responses in the questionnaire were qualitatively analyzed. Comments were read several times, and similar content was grouped into summary themes, which were subsequently reviewed by two authors.

Ⅳ Results

A Baseline characteristics

The participants were 13 caregivers of adolescents with AN. Data were collected from five psychoeducational groups. The group size ranged from two to six participants. Three participants dropped out, resulting in a dropout rate of 19 %. One of the two participants in the third group dropped out owing to close contact with a person infected with the COVID-19. The other participant completed the remaining sessions individually, rather than in the group format, and was therefore excluded from the analysis **(Fig. 1)**. Another participant in the fourth group refused to proceed and dropped out. Thirteen participants (10 mothers, one father, one grandmother, and one grandfather) completed the group psychoeducation sessions. **Table 2** presents the characteristics of the 13 participants. Children's %IBW was 73.4 (SD 9.4) pre-evaluation and progressively increased to 76.0 (SD 13.3) post-evaluation ; however, the difference was

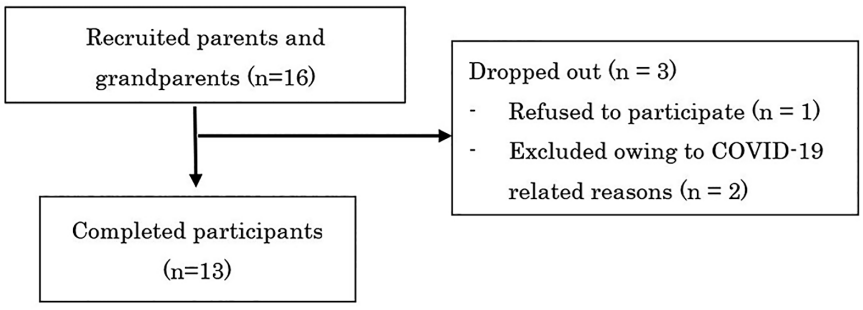

Fig. 1 Flowchart of study participants and dropouts

Table 2　Baseline characteristics

Characteristics		*p*-value	Effect size (*d*)
Sex of family (female/male)	11/2	–	–
Age of family, mean (SD), years	51.3 (9.9)	–	–
Sex of adolescents (female/male)	11/0	–	–
Age of adolescents, mean (SD), years	15.1 (2.5)	–	–
Inpatient/Outpatient	5/6	–	–
%IBW of adolescents (preintervention/postintervention)	73.4(9.4)/76.0(13.3)	0.598	0.23

Table 3　QIDS-J score between pre- and post-intervention

	Pre	Post	*p*-value	Effect size
Total	10.2(5.9)	8.6(6.0)	0.195	$r = 0.25$
Sleep disturbance	3.5(2.8)	3.4(2.9)	0.892	$d = 0.05$
Appetite / weight changes	1.5(2.1)	1.2(2.0)	0.527	$r = 0.12$
Psychomotor changes	0.5(0.9)	0.31(0.5)	0.705	$r = 0.07$

Table 4　SF-36 scores pre- and post-intervention

	Pre	Post	*p*-value	Effect size
Physical Functioning (PF)	85.8(15.5)	88.8(9.8)	0.196	$r = 0.25$
Role Physical (RP)	74.1(27.7)	81.3(11.7)	0.448	$r = 0.15$
Bodily Pain (BP)	69.5(21.4)	60.7(19.4)	0.212	$r = 0.25$
General Health perceptions (GH)	54.4(17.4)	55.8(16.4)	0.553	$d = 0.17$
Vitality (VT)	43.8(17.5)	51.0(21.0)	0.114	$r = 0.31$
Social Functioning (SF)	70.2(20.8)	76.9(24.9)	0.272	$r = 0.22$
Role-Emotional (RE)	74.4(27.3)	77.6(24.6)	0.412	$r = 0.16$
Mental Health (MH)	53.1(20.1)	58.1(18.7)	0.177	$d = 0.40$
PCS	51.7(12.2)	50.1(6.7)	0.522	$d = 0.18$
MCS	45.0(8.8)	46.1(9.9)	0.609	$d = 0.15$
RCS	43.9(10.9)	47.8(6.7)	0.133	$d = 0.45$

insignificant.

B　Family's mental functions

Depression was assessed using the QIDS-J. Effect sizes for the total score, appetite/weight change, sleep disturbance, and psychomotor changes were small between pre- and post-intervention **(Table 3)**. The total score decreased slightly, from 10.2 (SD 5.9) to 8.6 (SD 6.0), and the severity classification remained mild.

QOL was assessed using the SF-36. Most subscale scores were higher post-intervention than pre-intervention ; however, scores for Bodily Pain (BP) and the Physical Component Summary (PCS) were lower post-intervention **(Table 4)**. The Mental Component Summary (MCS) and Role/Social Component Summary (RCS) scores improved from pre- to post-intervention ; however, both remained below the Japanese normative standard at both time points.

C　Family functioning

The mean cohesion score shifted from "Enmeshed" to "Connected" from pre- to post-intervention. Adaptability remained classified as "rigid" at both pre- and post-intervention. Both the cohesion and adaptability scores showed substantial variability across families **(Table 5)**. Overall, family flexibility was low, and psychological and social distance tended to be slightly separated.

Table 5　FACESKG Ⅳ -16 scores pre- and post-intervention

	Pre	Post	*p*-value	Effect size(*d*)
Cohesion	2.8(2.9)	2.0(3.5)	0.300	0.30
Adaptability	-1.5(3.0)	-1.3(4.0)	0.726	0.10

Table 6　Free-comment responses from the pre-questionnaire

	Themes	Frequencies N (%)	Example of actual comments
What do you want to hear and expect from psychoeducation?	How to engage with adolescents	10 (77)	"What is the best way to support my daughter when she strongly complains of symptoms or she is feeling distress?" "I would like to ask how to manage my daughter when she is feeling confused."
	Concerns about the future of their adolescents	4 (31)	"Daily life after discharge from the hospital." "All I have is hope that my daughter will get better as soon as possible."
	Parents' feelings	1 (8)	"I feel bad when my daughter complains over and over, I get anxious myself."
What concerns or problems do you have about the future?	Symptoms of disease, prognosis	11 (85)	"Anxiety about eating at home." "That her current weight is just on the edge of the criteria for hospitalization, but she wants it" "Can she live independently?"
	Family involvement	3 (23)	"How should we respond and how should we support her life?" "How to talk to her when she does not see her future in her life."

D　Participant's feedback

The mean self-rated understanding of AN among family members increased significantly, from 4.7 (SD 1.5) pre-intervention to 7.2 (SD 1.2) post-intervention ($p = 0.003$, $r = 0.838$).

1　Pre-intervention questionnaire results

Responses to the two open-ended questions in the pre-questionnaire, "What do you want to hear and expect from psychoeducation?" and "What concerns or problems do you have about the future?", were analyzed qualitatively **(Table 6)**.

Regarding the first question, three themes were extracted :

a) "How to engage with adolescents" : This theme was the most frequently cited, mentioned by 10 participants (77 %). There were many questions about what to do when a child complains about food or acts in accordance with an illness.

b) "Concerns about the future of their adolescent" : Mentioned by four participants (31 %). Concerns were raised about the adolescents' future after being hospitalized and changing to an outpatient setting, and how life would progress.

c) "Parents' feelings" : Mentioned by one participant (8 %).

Regarding the second question, two themes were extracted :

a) "Symptoms of disease, prognosis" : Mentioned by 11 participants (85 %)

b) "Family involvement" : Mentioned by three participants (23 %).

2　Post-intervention questionnaire

Post-intervention questionnaires showed that 92 % of the participants were satisfied (very satisfied : 46 %, satisfied : 46 %), and 8 % felt neutral. Three themes were extracted in response to "Reason of satisfaction"

Table 7 Free-comment responses from the post-questionnaire

	Themes	Frequencies N (%)	Example of actual comment
Reason of satisfaction	To gain new awareness and correct knowledge about the disease.	8 (62)	"I didn't have much knowledge about this disease. I thought it was not severe. But when I participated in the sessions, I realized how serious the disease was and that it could lead to death."
	To be able to share one's concerns and get advice	5 (38)	"A free conversation with families who have children with AN was very informative."
	Persistent anxiety	2 (15)	"Still a lot of uncertainty about the future" "There is no end to the worries and anxieties of the future."
Feedback and concern	The concerns about disease prognosis and treatment	5 (38)	"I always wonder when she will recover and if her body will be okay." "I concern about how to treat AN in the future."
	The concerns of family involvement	4 (31)	"I have concerns about how I will let them eat and treated her after she is discharged from the hospital."
	Good things about participating	3 (23)	"I received psychoeducation and although I can't say for sure, I feel it gave me a better guide for relating to my daughter." "Other participants listened to me and I heard their journey and felt that I am not alone."
	Participants' own feelings toward their children	1 (8)	"I also had the same disease when I was a student. I feel sorry for my child, wondering if she will have to live the same life as I did."

to gain new awareness and correct knowledge about the disease (n = 8, 62 %), to be able to share one's concerns and get advice (n = 5, 38 %), and persistent anxiety (n = 2, 15 %) **(Table 7)**.

Four themes were extracted in response to the "Feedback and concern" the concerns about disease prognosis and treatment (n = 5, 38 %), the concerns of family involvement (n = 4, 31 %), positive aspects of participation (n = 3, 23 %), and participants' feelings toward their children (n = 1, 8 %) **(Table 7)**.

V Discussion

This study examined the feasibility and acceptability of group psychoeducation for families of adolescents with AN based on dropout rates, quantitative pre- and post-measures, and qualitative analyses of family responses. Given the limited research in Japan, this study provides preliminary evidence for its potential effectiveness.

The program dropout rate was 19 %, which was higher than the 10 % reported in a previous study[22]. However, when excluding the COVID-19 related withdrawal, the dropout rate attributable to the program itself was relatively low. Therefore, the higher overall dropout rate likely reflects the challenges of conducting the program during the pandemic. Notably, 92 % of the participants provided positive feedback on the program. Jointly, the relatively low underlying dropout rate and high satisfaction indicate that group psychoeducation could be feasible and acceptable.

The %IBW of adolescents increased gradually from pre- to post-intervention ; however, the change was statistically insignificant, which may be attributable to several factors : the program did not directly engage with the adolescents, hospitalized adolescents had fewer opportunities for family involvement, and several adolescents from participating families were in a stable condition and receiving outpatient care.

Regarding changes in family members' mental functioning, QIDS-J and SF-36 scores improved ; however,

most were statistically insignificant. These findings indicate that psychoeducation alone may be insufficient to alleviate caregiver depression substantially. Given that persistent caregiver depression has been linked to poor family functioning and diminished treatment outcomes[9], this study's results highlight the need for additional interventions that directly target caregiver depressive symptoms. The QIDS-J scores indicated that families of adolescents with AN were mildly depressed, consistent with a previous study[4]. Many SF-36 items exceeded the national average for the Japanese population. However, the MCS and RCS summary scores remained below the national average, indicating lower QOL in mental and role or social domains. Previous studies show that the QOL of caregivers of patients with eating disorders is low[23]. Therefore, caregivers need practical advice, information about eating disorders, and emotional support[23].

The slight improvement in QOL scores observed in this study is attributable to the knowledge gained from lectures and the free group conversations. Flexibility as a family function was low, and psychological and social distance tended to be slightly separated. A previous study shows that families of children with AN scored highly for enmeshment and rigidity, and low for cohesion[24]. Consistent with these findings, families in the present study were also classified as "Rigid." Notably, cohesion shifted from "Enmeshed" at pre-intervention to "Connected" at post-intervention, suggesting a shift toward more adaptive emotional boundaries and interaction patterns within the family. This direction of change may reflect the fact that family members acquired more adaptive ways of relating to the adolescents through psychoeducation.

The questionnaire revealed family members' anxieties. According to the pre-intervention questionnaire, many participants expressed anxiety about interacting with their adolescents and uncertainty about their future. Evidently, family relationships were a major source of anxiety. Additionally, many participants expressed a desire to learn about the symptoms and progression of AN, revealing limited previous knowledge about the disorder. The average score for the family's understanding of AN was low at 4.7, suggesting that families felt anxious about their lack of knowledge.

A post-questionnaire showed that 92 % of the participants were satisfied with the program, with many reporting that enhanced understanding of AN was a key influencing factor. The post-survey results showed that knowledge about AN improved from 4.7 to 7.2, suggesting that enhanced understanding leads to reduced anxiety. Resolving this issue likely contributed to the high satisfaction levels. The next most common theme was the opportunity to exchange opinions with other participants and receive advice from professionals and other families. Participating in a group setting enabled families to interact with other families facing similar challenges, which likely reduced feelings of isolation and fostered a sense of comfort. However, concerns about how to interact with their children persisted, suggesting that worries about parent-child interaction remained unresolved. Therefore, future programs may benefit from allocating more time to communication strategies and parent-child interaction skills, identified as ongoing areas of concern.

This study has two limitations : it was an open, uncontrolled trial, and the sample size was small. Participant recruitment was also limited to families in which at least one caregiver was able to attend the psychoeducation program at a single tertiary care hospital, which may have introduced selection bias and limited the generalizability of the findings. Therefore, the conclusions regarding the effects of psychoeducation on caregivers' depression and family functioning should be interpreted carefully. Furthermore, adolescents receiving inpatient and outpatient treatment were both included in this study. As a result, the physical and psychological distance between caregivers and adolescents during the intervention period may have differed across families. Previous studies suggest that caregivers' anxiety and depressive symptoms are associated with the severity of AN and the treatment context[25]. As this study was preliminary and involved a limited sample size, subgroup analyses or statistical adjustments for treatment setting or illness severity were not feasible. Future large-scale

studies may incorporate these factors as potential confounders. In addition, multiple family members from the same patient participated in some cases, resulting in non-independence of observations ; no statistical adjustment for clustering was performed, and the results should be interpreted with caution.

Future studies should include larger samples, multicenter recruitment, and comparative designs to further evaluate the effectiveness of this intervention. Larger samples would also allow for comparisons between inpatient and outpatient groups and adjustment for illness severity and family functioning, enabling a more rigorous evaluation of psychoeducation effects.

Nevertheless, given the limited research on family psychoeducation for adolescents with AN in Japan, the demonstrated feasibility, acceptability, and improvements in caregivers' understanding of the illness suggest that these preliminary findings represent an important step toward developing evidence-based support programs for caregivers.

Ⅵ Conclusion

This study suggests that group psychoeducation for families of adolescents with AN is feasible and acceptable, as indicated by low dropout rates and high satisfaction. Although family depressive symptoms did not significantly improve, QOL improved slightly, family cohesion shifted toward a more adaptive pattern, and families' understanding of the illness improved. These findings support the value of structured family psychoeducation in Japan.

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