

Psychological Treatments for Adult Patients with Anorexia Nervosa in Korea: A Retrospective Study

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Objective: International treatment guidelines recommend psychotherapy as the first-line treatment for anorexia nervosa (AN). Adaptation of Western evidence-based treatments to different cultures through personalization has become increasingly important, but evidence remains limited. This study examined the feasibility and effectiveness of AN outpatient psychotherapies in Korea.

Methods: A total of 160 adult patients diagnosed with AN (mean age = 25.3 years) were recruited from an eating disorder (ED) clinic in Korea. They received one of the following psychotherapy programs: motivational enhancement therapy with nutrition (MET with nutrition) (n = 47); Maudsley Model of Anorexia Nervosa Treatment for Adults (MANTRA) augmented by New Maudsley Model for Collaborative Care (NMCC) (n = 20); or Specialist Supportive Clinical Management (SSCM) (n = 93). Treatments were administered face-to-face by trained therapists, following protocols tailored to each individual. Demographic and ED-related clinical data were collected through standardized interviews and questionnaires at baseline and at the end of treatment.

Results: Overall dropout rate was 40.3%, with a lower rate observed in MANTRA augmented by NMCC and SSCM than MET with nutrition. All three psychotherapies increased body mass index (BMI), with minimal group differences. Individuals with lower baseline BMI and those who attended more sessions experienced greater BMI increases across all psychotherapies.

Conclusion: Psychotherapies for AN were feasible and showed promise in terms of effectiveness among Korean patients. Despite comparable BMI increases, the therapies led by experienced therapists and with greater personalization had lower dropout rates. Further studies using randomized controlled trials are needed while controlling for variables outside treatments.

KEY WORDS: Anorexia nervosa; Psychotherapy; Motivational enhancement therapy; Maudsley Model of Anorexia Nervosa Treatment for Adults; Experienced carers helping others; Specialist Supportive Clinical Management.

INTRODUCTION

Anorexia nervosa (AN) is an eating disorder (ED) characterized by an intense fear of weight gain, leading to restriction in food intake and extreme underweight [1].

Increases in the prevalence of AN have been reported in Asia, with point prevalence rates exceeding 4% [2]. Despite the high prevalence, only 13.28 people per 100,000 with EDs including AN were treated within the medical insurance system in Korea, indicating the suboptimal management of the disorders in the country [3].

Psychological interventions are recommended as the first-line treatment for individuals with AN by international guidelines. Specifically, guidelines from the United Kingdom's National Institute for Health and Care Excellence [4] and the Royal Australian and New Zealand

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College of Psychiatrists [5] suggest considering one of the following individual therapies: ED-focused cognitive behaviour therapy (CBT) [6], Maudsley Model of Anorexia Nervosa Treatment for Adults (MANTRA) [7], or Specialist Supportive Clinical Management (SSCM) [8]. These guidelines recommend explaining the treatment options to the patient to help them choose the one they would prefer. Treatments usually incorporate a degree of customization through individual case formulation. On the one hand, motivational interviewing (MI) [9] enhances opportunities for change in eating pathology in AN, but a sufficient number of sessions is required to optimize motivation and/or reduce eating pathology [10].

Meta-analyses of clinical trials have not conclusively supported the superiority or inferiority of any specific manualized psychological interventions for adults with AN [11]. The findings from a systematic meta-review also revealed the absence of a varying effect across most individual psychotherapeutic interventions for AN in adult patients [12].

The existing literature on ED treatments has focused on Western populations [13], with ethnic minority groups frequently being underrepresented. More empirical evidence on ED treatments in non-Western populations is crucial. Moreover, ethnic and racial considerations need to be included when developing treatments and/or assessing outcomes [14]. Psychological interventions for EDs in East Asia have demonstrated good acceptability and completion rates in a systematic scoping review [15].

The adaptation of Western evidence-based treatments for use in other cultures through personalization is an emerging area of interest in the field of AN treatment [16]. Currently, there are no standard guidelines for the treatment of AN in Korea, and evidence on the topic remains scarce. Thus, there is a need to evaluate a wider range of interventions (e.g., MANTRA, SSCM) for adults and to build a strong base of empirical evidence within the country.

It has been emphasized that psychotherapies for AN should be understood within their sociocultural context and tailored accordingly [17]. To develop effective psychological interventions for Korean patients with AN, we adapted evidence-based approaches to improve outcomes by taking cultural differences into account. Specifically, we adapted the original protocols by adjusting MANTRA to include collateral participation from family members through the New Maudsley Model for Collabor-

ative Care (NMCC) [18], working with both the patient and their immediate family. Additionally, we implemented motivational enhancement therapy (MET), which is less influenced by cultural context as it primarily focuses on deriving a motivation [19], rather than addressing dysfunctional beliefs about shape and weight as addressed in standard CBT. Meanwhile, SSCM's emphasis on flexibility and responsiveness allows for personalization based on patients' changing needs, compared to strictly protocolized treatments [20], suggesting its potential to address cultural gaps during treatment.

In the present study, we retrospectively analyzed a Korean clinical cohort with AN treated with the evidence-based psychotherapies to examine their feasibility and effectiveness. The primary treatments were MET for AN with an emphasis on refeeding and nutritional rehabilitation (MET with nutrition), MANTRA augmented by NMCC, and SSCM. Treatment feasibility was assessed by dropout rates. Effectiveness was primarily measured by changes in body mass index (BMI) and secondarily by changes in the frequency of pathological eating behaviors [21]. We hypothesized that (a) each type of psychotherapy would lead to improvement in BMI and ED-related behaviors, and (b) SSCM that offers more flexibility to accommodate patients' needs would be more feasible.

METHODS

Study Cohort and Participants

This study examined the treatment outcomes of a retrospective clinical cohort at an ED clinic in Seoul Paik Hospital, Inje University, Seoul, from April 2016 to March 2023. Patients could access the clinic directly or through referrals. The clinic catered to all age ranges and provided both outpatient and inpatient treatments. Patients in the outpatient psychotherapy programs were referred to the collateral ED psychotherapy center outside of the clinic. Most patients paid for the treatments themselves, but some received partial benefits from their local governments or schools. All outcome data were de-identified and digitally recorded by researchers blind to treatment assignment.

The inclusion criteria required the participants to have a Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) [1] diagnosis of AN and to have received outpatient psychotherapy at the clinic. They were

required to be at least 18 years old and receiving MET with nutrition, MANTRA augmented by NMCC, or SSCM. The study focused on evidence-based psychotherapies administered according to protocols. We culturally adapted the original protocols by tailoring the language during translation, adjusting the structure to provide treatments with a shortened duration, and incorporating NMCC with MANTRA, based on our observation that Korean adults with AN are family oriented. We also employed culturally neutral MET.

Among 174 adult patients with AN who were assessed, 160 (MET with nutrition = 47; MANTRA augmented by NMCC = 20; SSCM = 93) were included in the study; others received MANTRA only ($n = 11$), unstructured treatment ($n = 2$), or had missing data ($n = 2$). Patients who received psychological treatments reported higher BMI and were younger than those who did not (Table 1). Patients had a mean age of 25.25 ± 7.07 years (seven males; 4.38%), a mean BMI of 15.89 ± 2.22 kg/m², and a mean illness duration of 56.95 ± 55.36 months. Ninety-six patients (60%) were diagnosed with AN binge-purge type. Seven patients (MET with nutrition = 5; SSCM = 2) were not included in the final analyses due to incomplete or lost outcome data. Figure 1 displays the flowchart of participants from enrolment to analysis.

As we could not find information on the exact number of sessions for 14 patients, we calculated dropout rates using data from 139 patients. The patients were given psychotropic medication, mainly selective serotonin reuptake inhibitors, if needed. The study was approved by the Institutional Review Board of Inje University (INJE 2023-12-001).

Diagnosis and Assessment

Baseline status was assessed as part of routine clinical evaluations. Patients were diagnosed with AN by an ED specialist according to DSM-5. A clinical psychologist further assessed the patients using the Korean version of the Eating Disorder Examination Interview [22,23], and the information was integrated to formulate treatment plans. Patients completed demographic and self-reported questionnaires, including the Eating Disorder Diagnostic Scale (EDDS) [24] and the Eating Disorder Examination Questionnaire (EDE-Q) [25], as well as general psychopathology, including the Depression Anxiety Stress Scale-21 (DASS-21) [26], to evaluate the full spectrum of ED psycho-

pathology. The reliability of the Korean versions of the questionnaires was satisfactory (EDDS: Cronbach's $\alpha = 0.72$ [27]; EDE-Q: Cronbach's $\alpha = 0.92$ [28]; and DASS-21: Cronbach's $\alpha = 0.87, 0.83$, and 0.83 for the Depression, Anxiety, and Stress subscales, respectively [29]). Height and weight were measured and a medical evaluation was conducted if necessary.

Treatments

Treatment overview

Based on the formulation for each case, clinicians selected treatments according to patients' preference and clinical features with the goal of improving outcomes while considering therapist availability. Patients with more complex pathological eating behaviors (e.g., frequent compensatory behaviors) were assigned to SSCM, as the therapy could be applied flexibly to address these behaviors. MET with nutrition was primarily considered when refeeding was the main priority. If family involvement was assessed as a contributing factor in the maintenance of AN, patients were primarily assigned to MANTRA augmented by NMCC.

The patients received weekly individual therapy sessions, which could be modified depending on the illness severity. Physical risk was monitored as part of the treatments. Each therapy session lasted approximately 50 to 60 minutes. The programs were adapted to include 20 weekly sessions (biweekly for the first 2 weeks for SSCM). All treatments were provided face-to-face by certified mental health nurses and clinical psychologists trained in ED treatments. Each of these treatments was protocolized but was also tailored to the individual. See Tables 2 to 4 for detailed descriptions of each treatment.

Motivational enhancement therapy with nutrition

This treatment is based on the MET framework accompanied by the MI workbook for AN [8]. Our MET intervention consisted of 16 weekly 50-minute face-to-face sessions. Intervention could be terminated after eight sessions if deemed necessary based on therapeutic needs (e.g., transition to other treatments or participant request). The workbook was provided either in person or as an online resource. The treatment focused on motivating patients to take control of their recovery. We also adapted the nutrition module from standard CBT, which focuses

Table 1. Clinical characteristics of patients with anorexia nervosa at baseline and the number of therapeutic sessions administered in different treatment groups (n = 414)

Clinical variables	All					Received					
	Did not receive (n = 254)	Received (n = 160)	t(df)	p	d	MET with nutrition ^a (n = 47)	MANTRA augmented by NMCC ^b (n = 20)	SSCM ^c (n = 93)	F(df)	p	η^2
Age, yr	27.04 (7.62) (254)	25.24 (7.06) (160)	2.406 (412)	0.017	0.243	25.55 (6.12) (47)	23.45 (8.66) (20)	25.47 (7.16) (93)	0.736 (157)	0.481	0.009
Onset age, yr	21.33 (6.39) (231)	20.52 (6.02) (155)	1.254 (384)	0.211	0.130	21.26 (4.86) (46)	18.37 (2.06) (19)	20.59 (6.97) (90)	1.581 (152)	0.209	0.020
Current BMI	15.23 (2.47) (249)	15.89 (2.21) (157)	-2.692 (404)	0.007	-0.274	15.67 (1.57) (46)	15.56 (2.36) (20)	16.07 (2.45) (91)	0.761 (154)	0.469	0.010
Highest ever BMI	22.27 (3.97) (245)	22.24 (3.96) (158)	0.065 (401)	0.948	0.007	22.56 (4.37) (47)	21.12 (3.66) (20)	22.32 (3.81) (91)	0.973 (155)	0.380	0.012
Lowest ever BMI	14.16 (2.35) (228)	14.49 (1.94) (156)	-1.441 (382)	0.150	-0.150	14.31 (1.96) (47)	14.02 (2.35) (19)	14.68 (1.83) (90)	1.194 (153)	0.306	0.015
Duration, mo	66.12 (71.44) (231)	56.93 (55.20) (154)	1.351 (383)	0.178	0.141	53.30 (52.67) (46)	61.74 (91.07) (19)	57.78 (46.58) (89)	0.180 (151)	0.836	0.002
Binge-purge type	156 (61.4%)	96 (60%)	$\chi^2 = 0.083$ (1)	0.774	$\phi = 0.018$	28 (59.6%)	13 (65%)	55 (59.1%)	$\chi^2 = 0.241$ (2)	0.887	$\phi = 0.050$
Starvation	N/A	N/A	N/A	N/A	N/A	1.10 (2.17) (46)	2.40 (2.35) (20)	2.44 (3.51) (91)	3.136 (154)	0.046	0.039
Excessive exercise	N/A	N/A	N/A	N/A	N/A	1.07 (2.32) (45)	1.70 (2.60) (20)	0.91 (2.94) (91)	0.681 (153)	0.508	0.009
Binge eating	N/A	N/A	N/A	N/A	N/A	3.53 (3.75) (46)	3.88 (5.06) (20)	4.19 (5.40) (91)	0.272 (154)	0.762	0.004
Purging	N/A	N/A	N/A	N/A	N/A	3.75 (4.43) (46)	4.28 (6.22) (20)	6.86 (8.58) (91)	3.143 (154)	0.046	0.039
Laxative use	N/A	N/A	N/A	N/A	N/A	0.50 (1.60) (46)	1.25 (2.53) (20)	0.78 (2.40) (91)	0.809 (154)	0.447	0.010
EDE-Q, global	2.97 (1.59) (236)	3.22 (1.49) (128)	-1.436 (362)	0.152	-0.158	2.87 (1.48) (39)	3.19 (1.69) (18)	3.42 (1.44) (74)	1.781 (128)	0.173	0.027
Restraint	3.08 (2.03) (236)	3.22 (1.95) (128)	-0.630 (362)	0.529	-0.069	2.51 (1.95) (39)	3.39 (2.26) (18)	3.53 (1.81) (74)	3.703 (128)	0.027	0.055
Eating concern	2.82 (1.79) (236)	3.07 (1.64) (128)	-1.333 (362)	0.183	-0.146	2.77 (1.93) (39)	3.09 (1.79) (18)	3.23 (1.45) (74)	0.994 (128)	0.373	0.015
Weight concern	2.83 (1.71) (236)	3.13 (1.78) (128)	-1.574 (362)	0.116	-0.173	3.01 (1.55) (39)	3.06 (1.96) (18)	3.24 (1.85) (74)	0.234 (128)	0.791	0.004
Shape concern	3.16 (1.62) (236)	3.45 (1.54) (128)	-1.640 (362)	0.102	-0.180	3.17 (1.50) (39)	3.24 (1.70) (18)	3.68 (1.50) (74)	1.646 (128)	0.197	0.025
DASS-21, total	30.45 (16.07) (229)	31.40 (15.42) (119)	-0.530 (346)	0.596	-0.060	32.39 (13.05) (31)	34.65 (16.74) (17)	30.20 (16.10) (71)	0.653 (116)	0.522	0.011
Depression	10.95 (6.50) (229)	11.81 (6.38) (119)	-1.178 (346)	0.240	-0.133	11.90 (6.12) (31)	12.47 (7.12) (17)	11.61 (6.38) (71)	0.129 (116)	0.879	0.002
Anxiety	7.42 (5.54) (229)	7.47 (5.49) (119)	-0.075 (346)	0.940	-0.009	7.97 (4.97) (31)	8.29 (5.93) (17)	7.06 (5.63) (71)	0.517 (116)	0.598	0.009
Stress	12.08 (5.80) (229)	12.13 (5.68) (119)	-0.066 (346)	0.947	-0.007	12.52 (4.91) (31)	13.88 (5.28) (17)	11.54 (6.05) (71)	1.274 (116)	0.284	0.021
Therapy, session	N/A	N/A	N/A	N/A	N/A	7.85 (7.05) (26)	15.40 (16.37) (20)	20.53 (20.51) (90)	5.070 (133)	0.008	0.071
Therapy, mo	N/A	N/A	N/A	N/A	N/A	2.50 (2.28) (26)	4.60 (3.33) (20)	4.60 (4.23) (90)	3.191 (133)	0.044	0.046

Values are presented as number (%) or mean (standard deviation) (total number). BMI was calculated as kg/m². Starvation, excessive exercise, binge eating, purging, and laxative use were measured by frequency per week.

MET with nutrition, motivational enhancement therapy with nutrition; MANTRA augmented by NMCC, Maudsley Model of Anorexia Nervosa Treatment for Adults augmented by the New Maudsley Model for Collaborative Care; SSCM, specialist supportive clinical management; BMI, body mass index; EDE-Q, Eating Disorder Examination Questionnaire; DASS-21, Depression, Anxiety, Stress Scale-21; N/A, not available.

Post-hoc Tukey honest significant difference starvation a < c, EDE-Q restraint a < c, therapy session a < c, therapy months a < c.

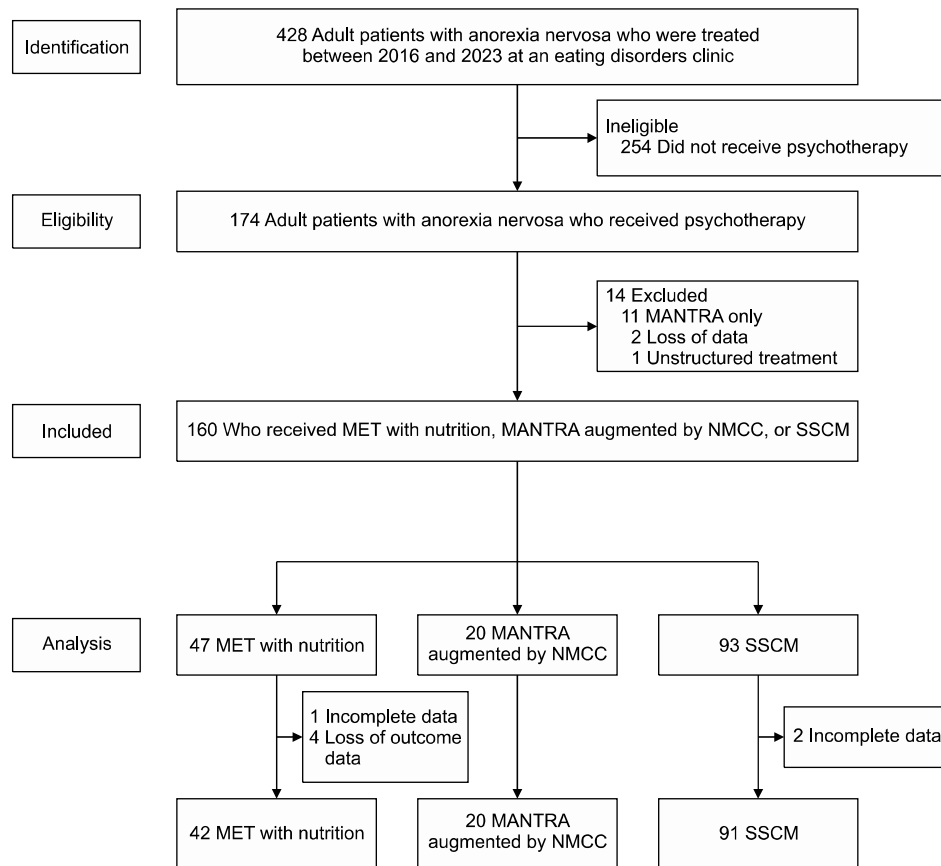


Fig. 1. Flowchart of participants from identification to analysis. MET with nutrition, motivational enhancement therapy with nutrition; MANTRA augmented by NMCC, Maudsley Model of Anorexia Nervosa Treatment for Adults augmented by the New Maudsley Model for Collaborative Care; SSCM, Specialist Supportive Clinical Management.

on nutrition to initiate and maintain refeeding and weight gain in each session. Enhancement of self-efficacy and self-monitoring were key components throughout the treatment process (Table 2).

Maudsley Model of Anorexia Nervosa Treatment for Adults Augmented by the New Maudsley Model for Collaborative Care

The treatment is an adapted form of ECHOMANTRA (Experienced Carers Helping Others, ECHO; Maudsley Model of Anorexia Nervosa Treatment for Adults, MANTRA), developed by Professor Janet Treasure and her team [30]. We administered a combined intervention including MANTRA and NMCC. MANTRA is a psychotherapy based on cognitive and motivational principles. It aims to enhance the patient's motivation for change and understand the conflict between their desire to sustain the illness and their motivation to recover [7]. MANTRA employs a Korean version of the workbook and a library of video clips for patients (vodcasts) including recovery narratives based on lived experience [31-33]. These were utilized as

guided self-management interventions to augment the treatment [32]. NMCC was developed for the carers of adults with AN [18]. The approach employs a flexible format to empower caregivers with skills that not only support the individual but also manage their own response to the disorder (e.g., developing resilience and emotion regulation skills) [34]. In NMCC, carers were provided with a Korean version of the carer workbook, a comprehensive guide titled Skills-Based Caring for a Loved One with an Eating Disorder [35], and vodcasts featuring role-plays demonstrating carer skills. Details of the treatment and adaptations are provided in Table 3.

Specialist Supportive Clinical Management

SSCM is person-centered, focusing on the individual through supportive psychotherapy and clinical management, with a flexible and responsive approach to targeting AN-related symptoms [8,36,37]. SSCM offers guidance on weight gain and maintenance strategies, energy requirements, and re-establishing healthy eating habits. The remainder of the sessions focuses on content decided

Table 2. Description of MET for AN with nutrition using TIDieR checklist

Item No.	Item	Description
1	Brief name	MET with nutrition
2	WHY: theoretical basis (rationale)	MET is applied to increase patients' motivation to change. The form of MET used is based on MI, a technique targeting readiness to change [9]. MET aims to improve patients' motivation to recognize the illness and seek appropriate, individualized help. It covers the effects of starvation, health, and psychological risks, as well as the different motivational stages of illness to help patients identify factors and encourage them to seek help and choose a tailored approach to combat the illness. The treatment focuses on motivating patients to take control of their recovery. Enhancement of self-efficacy and self-monitoring are key components throughout the treatment process.
3	WHAT: materials used in the intervention	MET was provided according to a manualized treatment protocol and we used the Korean version of the MI workbook for AN [9]. The structure of the MET was as follows: Section I consisted of overview and topics including 'What is Anorexia Nervosa?,' 'Avoid the Blame Game,' and 'Centuries of Trying to Understand Food Refusal.' Section II included 'Starting the Recovery Journey,' 'Understanding Yourself,' 'The Dangers of Anorexia Nervosa,' 'Body Composition and Nutrition,' and 'Digging Deeper: Understanding Personality Patterns,' 'Links in Generations,' and 'Recovery is Possible.' Modules of the treatment were sequentially administered according to the protocol. We adapted some modules from standard CBT such as nutrition to initiate and maintain regular eating and healthy weight gain. The materials were administered either in print or online.
4	WHAT: procedures used in the intervention	The treatment involved 20 sessions, with each individual session lasting 50 minutes, including 4 to 12 sessions of nutritional rehabilitation.
5	WHO: provided	Clinical psychologists and psychiatric nurses were involved in the therapy. All therapists were experienced in using MET for eating disorders and trained in CBT, and they participated in the treatment.
6	HOW: modes of delivery	The patients received face-to-face therapy sessions.
7	WHERE: type of locations	Sessions were delivered in a safe and private place in the treatment center.
8	WHEN and HOW MUCH: frequency and duration	MET intervention was structured as 16–20 weekly, 50-minute face-to-face sessions. Termination of the intervention within ten sessions was permitted based on therapeutic needs, such as referral to other therapies, or the participant's request.
9	TAILORING: personalization of the intervention	MET was manualized but was also tailored to the individual with the goal of improving outcomes.
10	MODIFICATION	No modifications were made.
11	HOW WELL: planned fidelity to the intervention	All therapists attended the workshop for MET for AN by JT in Seoul in 2013. The therapists were trained in CBT skills, motivational interviewing, and the AN model and engaged in reviews of the workbooks and related materials by YK. YK completed training courses in motivational interviewing provided by the developer (JT) at Maudsley Hospital in the UK in 2003–2004 and 2009–2010.
12	HOW WELL: actual fidelity to the intervention	Therapists documented each treatment session, which were monitored by the supervisor (YK). Therapists received weekly feedback regarding their adherence to the manual.

TIDieR, Template for Intervention Description and Replication; MET, motivational enhancement therapy; MI, motivational interviewing; AN, anorexia nervosa; CBT, cognitive behaviour therapy.

through discussion with the patient. SSCM mainly employs general, supportive therapeutic techniques as outlined in its original manuals. The protocol includes a set number of sessions that focus on eating patterns and weight gain and provides psychoeducational handouts (Table 4).

Therapist allocation and supervision

Two clinical psychologists and two mental health nurses, all certified as first-grade mental health professionals or with equivalent qualification, delivered the treatments. While all therapists had over five years of experience in treating EDs, senior therapists (e.g., over 10 years of experience)

led SSCM as it is a flexible and responsive therapy that can be delivered by various clinicians experienced in treating AN [20]. MET with nutrition and MANTRA augmented by NMCC were each delivered by a single therapist. SSCM was delivered by one clinical psychologist and one mental health nurse, with the nurse primarily responsible for nutrition and weight management, and the psychologist addressing psychological difficulties.

YK attended training workshops for MET held by the treatment developer Professor Janet Treasure, and the Maudsley training course for AN and family work. The treatment team attended lectures and received guidance from Professor Janet Treasure in Seoul, Korea. They com-

Table 3. Description of MANTRA augmented by NMCC using TIDieR checklist

Item No.	Item	Description
1	Brief name	MANTRA augmented by NMCC
2	WHY: theoretical basis (rationale)	It is an adapted form of ECHOMANTRA developed by Professor Janet Treasure and her team [30]. MANTRA is based on a cognitive, interpersonal maintenance model that identifies four areas, including biological and psychological factors that contribute to both the predisposition to and maintenance of AN: 1) the emotional and social mind, 2) identity, 3) thinking styles, and 4) relationships. These areas are directly targeted in the treatment. The model suggests that AN often arises in individuals with anxious/obsessional traits, maintained by four factors: 1) cognitive rigidity and focus on details over the bigger picture, 2) socio-emotional impairments (e.g., avoidance of emotions), which are worsened by starvation, 3) beliefs regarding the utility of AN, and 4) reinforcement by significant others by accommodation or enabling behaviors. It consists of the following phases: initiating conversations about change by providing health risk feedback and exploring the value of AN, developing a collaborative case formulation and treatment plan, working on socio-emotional and cognitive impairments, and conducting behavioral experiments. The final phase addresses relapse prevention and treatment conclusion. NMCC was originally designed for the caregivers of adults with treatment-resistant AN. It draws from the cognitive, interpersonal model, which identifies both intra- and interpersonal factors that maintain the illness [7,30,34]. The treatment aims to address these factors, focusing on reducing isolation and promoting healthier relationships [19]. Caregivers are educated in self-care and how to handle their own stress responses to their loved one's disorder. Skill-based training offers an evidence-based framework that includes information and targeted caregiving skills. NMCC consists of the following three phases. Phase 1 addresses understanding the key risk and maintenance factors of the illness, especially those impacting social functioning and eating habits. The second phase highlights how caregivers might unintentionally reinforce the illness through their own anxiety and accommodating behaviors by teaching advanced communication and behavior strategies to establish a supportive family environment. Phase 3 emphasizes guiding individual recovery through compassionate communication skills for ED-related emotions and motivational interviewing. Considering that most adult patients tend to live with their parents in Korea, patients were expected to benefit from carers' involvement by the addition of NMCC to individual treatment with MANTRA.
3	WHAT: materials used in the intervention	It is a manualized, modularized, and flexible treatment. The treatment skills of MANTRA and NMCC are taught to patients and parents using short videos (vodcasts) and a manual for patients and caregivers. Support from individuals with lived experience were provided through a vodcast library of recovery tips and a self-care toolkit (Recovery MANTRA) [30]. We used a Korean version of the toolkit [32] and the Korean versions of the NMCC manuals [35] and DVDs for caregivers. Patients and their families could access to the workbook and the library of video clips through online.
4	WHAT: procedures used in the intervention	Each session consisted of a 60-minute meeting with the patient.
5	WHO: provided	Two therapists and psychiatric nurses with over 5 years of experience in treating eating disorders, who held certifications as first-grade mental health professionals or the equivalent participated in the treatment. JT conducted workshops and lectures on MANTRA and NMCC, which all therapists attended. The therapists were trained by YK in using manual-based MANTRA and NMCC for AN.
6	HOW: modes of delivery	The patients received weekly face-to-face sessions. The caregivers were offered 30 to 60-minute telephone or face-to-face sessions.
7	WHERE: type of locations	Sessions were delivered in a safe and private place in the treatment center.
8	WHEN and HOW MUCH: frequency and duration	The patients received 20 individual therapy sessions once weekly, followed by two monthly sessions over 6 months. Caregivers were offered an additional 5–10 telephone or face-to-face sessions.
9	TAILORING: personalization of the intervention	While following the manuals, MANTRA augmented by NMCC was offered in a flexible format, catering to the needs of both the patient and the caregiver.
10	MODIFICATION	No modifications were made.
11	HOW WELL: planned fidelity to the intervention	The therapists were trained in implementing MANTRA and NMCC. During treatment, YK provided weekly supervision of cases through email, telephone, or face-to-face meetings based on session transcripts.
12	HOW WELL: actual fidelity to the intervention	Therapists received weekly feedback regarding their adherence to the manual.

MANTRA augmented by NMCC, Maudsley Model of Anorexia Nervosa Treatment for Adults augmented by the New Maudsley Model for Collaborative Care; TIDieR, Template for Intervention Description and Replication; ECHO, Experienced Carers Helping Others; MANTRA, Maudsley Model of Anorexia Nervosa Treatment for Adults; AN, anorexia nervosa.

Table 4. Description of the SSCM for AN using TIDieR checklist

Item No.	Item	Description
1	Brief name	SSCM
2	WHY: theoretical basis (rationale)	SSCM combines features of clinical management and supportive psychotherapy. Clinical management emphasizes the therapist's expertise in ensuring safe patient management, providing education, and offering support. Supportive psychotherapy focuses on the therapist's acceptance of the patient, maintaining a positive outlook, highlighting strengths, and employing a collaborative conversational style with appropriate praise, reassurance, and advice. The primary focus of SSCM is addressing abnormal nutritional status and eating patterns, promoting normal eating habits and weight restoration, and offering guidance on weight gain, maintenance strategies, and energy requirements. The therapy is adjusted for each patient's needs in three phases: orientation to treatment and goal-setting for weight restoration and normal eating; monitoring target symptoms and supporting the patient's progress toward these goals; and discussing issues related to therapy conclusion and future plans.
3	WHAT: materials used in the intervention	The translated Korean version of the manual [37] was used for treatment. Psycho-educational handouts were used flexibly for patients throughout treatment.
4	WHAT: procedures used in the intervention	Each session lasted approximately 50 minutes.
5	WHO: provided	Psychiatric nurses and clinical psychologists were involved in the treatments. All therapists were experienced in treating eating disorders, each with a certification as a first-grade mental health professional or an equivalent level. The nurses were primarily responsible for nutrition and weight management, while the psychologists played a supporting role in addressing psychological difficulties. Each therapist received initial training in specific psychotherapies for AN. Additionally, all therapists attended training sessions on SSCM, with periodic booster sessions to update their skills in eating disorder treatment.
6	HOW: modes of delivery	The patients received face-to-face therapy sessions.
7	WHERE: type of locations	Sessions were delivered in a safe and private place in the treatment center.
8	WHEN and HOW MUCH: frequency and duration	Phase 1/Engagement/2–5 sessions Phase 2/Treatment/15–20 sessions Phase 3/Termination & beyond/2–5 sessions Treatments involved 20 ± 4 individual treatment sessions provided over 6 months in the setting. Patients were scheduled for two therapy sessions per week during the first 2 weeks. In the final month, the frequency was reduced to one session every 2 weeks.
9	TAILORING: personalization of the intervention	The SSCM was also tailored to the individual with the goal of improving outcomes.
10	MODIFICATION	No modifications were made.
11	HOW WELL: planned fidelity to the intervention	Therapists documented each treatment session. The supervisor (YK) was responsible for corresponding treatment orientations, monitoring every session, and reviewing the documentation.
12	HOW WELL: actual fidelity to the intervention	Regular weekly supervision was provided by YK. Therapists received weekly feedback regarding their adherence to the manual.

SSCM, Specialist Supportive Clinical Management; TIDieR, Template for Intervention Description and Replication; AN, anorexia nervosa.

pleted training workshops and attended mandatory weekly one-on-one supervision sessions led by YK. Each treatment generated specific materials (e.g., thought records, motivational letters, and diaries) and were reviewed for quality. Supervision consisted of case discussions, behavioral rehearsals, and treatment planning, along with the weekly review of materials. The fidelity of SSCM specifically focused on safety, education, and support. The team held weekly meetings to discuss cases, ensure consistent communication across therapies, and address challenges with advice from external experts in nutrition (e.g., clinical nutritionist and pediatrician), if needed.

Measures

Treatment effects were assessed by changes in BMI and ED-related behaviors, measured by EDDS, at the end of the intervention. Feasibility was measured by dropout rates. Patients were considered to have dropped out if they discontinued treatment before the tenth session (i.e., 50% of sessions) either due to personal reasons or because they required admission, following the criterion used in other studies [38].

Data Analyses

All statistical analyses were performed using the in-

tention-to-treat principle, with case-wise deletion applied to each dependent variable. The means of the continuous variables in the treatment groups were compared using one-way analysis of variance (ANOVA). Chi-square tests were used for categorical variables. A mixed ANOVA was conducted to examine significant effects, including the main effects of time (both across the entire sample and within each group), the interaction between time and group (variations between groups over time), and group differences irrespective of time. Linear regression analyses were conducted to examine the relationship between patients' baseline clinical characteristics and number of treatment sessions (independent variables), and the treatment outcome measured as the difference between BMI before and after treatment (dependent variable). Effect sizes were calculated as partial eta squared (η_p^2) or phi (ϕ) where appropriate. All analyses were conducted using SPSS 25.0 for Windows (IBM Co.) with an alpha level of 0.05.

RESULTS

Clinical Characteristics of Patients with AN at Baseline and the Number of Therapeutic Sessions Administered in Different Treatment Groups

Table 1 compares the baseline clinical characteristics of patients with AN who received different treatments. Patients in the SSCM group reported more frequent starvation ($F(2,154) = 3.14, p = 0.046, \eta_p^2 = 0.04$) and higher EDE-Q restraint scores ($F(2,124) = 3.70, p = 0.027, \eta_p^2 = 0.06$) than those in the MET with nutrition group with small to medium effect sizes.

At the end of treatment, the SSCM group had more therapy sessions ($F(2,133) = 5.07, p = 0.008, \eta_p^2 = 0.07$) and a longer therapy duration ($F(2,133) = 3.19, p = 0.044, \eta_p^2 = 0.05$) than the MET with nutrition group, with medium effect sizes.

Dropout Rates of Patients with AN in Different Treatment Groups

When dropout was defined as completing fewer than 10 sessions (i.e., 50% of sessions as specified in the protocols), the overall dropout rate was 40.3%. The dropout rates for each treatment group were 59% (17/29) in the MET with nutrition group, 40% (8/20) in the MANTRA augmented by NMCC group, and 34% (31/90) in the

SSCM group. Those who received SSCM tended to have a relatively lower dropout rate than those in the MET with nutrition group ($\chi^2(2) = 5.33, p = 0.07$).

Effects of Treatments on Outcome Measures in Different Treatment Groups

Table 5 shows the effects of treatments on BMI, weight, and pathological ED behaviors from pre-treatment (T0) to post-treatment (T1) across the groups. Based on the intention-to-treat approach, this analysis included all patients who completed baseline assessments and at least one primary outcome measure at the end of treatment. Time had a significant main effect on the outcomes, indicating that all groups showed improvements in the outcome measures at T1, with medium (ED behaviors) to large (body weight and BMI) effect sizes. There was a significant main effect of treatment group on the frequency of starvation ($F(1,154) = 6.59, p = 0.002, \eta_p^2 = 0.08$) with a large effect size. Patients who received MET with nutrition exhibited lower levels of starvation frequency at both baseline and the end of treatment compared to other groups. Additionally, there was a significant interaction between time and group on the frequency of self-induced vomiting ($F(1,154) = 4.23, p = 0.016, \eta_p^2 = 0.552$) with a large effect size. The MET with nutrition group showed less improvement in self-induced vomiting over the course of treatment compared to the other groups.

Associations between Clinical Characteristics at Baseline and Change in BMI

We explored the associations between the change in BMI, and baseline clinical variables and the number of sessions in the treatment groups (Table 6). Overall, the change in BMI was moderately and negatively associated with the patient's baseline BMI ($\beta = -0.44, t(99) = -4.61, p < 0.001$), and was moderately and positively associated with the number of therapy sessions ($\beta = 0.38, t(99) = 3.97, p < 0.001$). It was not associated with other baseline clinical variables.

DISCUSSION

This study examined the feasibility and effectiveness of psychotherapies for AN (MET with nutrition, MANTRA augmented by NMCC, and SSCM) in a real-world treatment setting in Korea. The therapies were applied based

Table 5. Comparison of clinical outcome measures between pre- (T0) and post-treatment (T1) in treatment groups

Clinical variables		MET with nutrition	MANTRA augmented by NMCC	SSCM	F-T (df)	p (T)	η_p^2 (T)	F-G	p (G)	η_p^2 (G)	F-T $\times$ G	p (T $\times$ G)	η_p^2 (T $\times$ G)
Weight, kg	T0	40.96 (5.21)	40.39 (6.82)	42.80 (7.63)	30.429 (1,149)	< 0.001	0.170	1.800	0.169	0.024	0.584	0.559	0.008
	T1	43.50 (6.36)	44.76 (8.99)	45.92 (7.50)									
BMI, kg/m ²	T0	15.65 (1.61)	15.56 (2.36)	16.07 (2.45)	28.507 (1,150)	< 0.001	0.160	0.717	0.490	0.009	0.056	0.604	0.007
	T1	16.69 (2.28)	17.24 (3.28)	17.19 (2.55)									
Starvation	T0	1.10 (2.17)	2.40 (2.35)	2.44 (3.51)	13.174 (1,154)	< 0.001	0.079	6.588	0.002	0.079	0.338	0.714	0.004
	T1	0.26 (0.80)	0.85 (1.81)	1.23 (2.02)									
Excessive exercise	T0	1.07 (2.32)	1.70 (2.60)	0.91 (2.94)	14.763 (1,153)	< 0.001	0.088	1.165	0.315	0.015	0.415	0.661	0.005
	T1	0.00 (0.00)	0.40 (0.99)	0.16 (0.70)									
Binge eating	T0	3.53 (3.75)	3.88 (5.06)	4.19 (5.40)	21.917 (1,154)	< 0.001	0.125	0.192	0.826	0.002	1.491	0.228	0.019
	T1	2.41 (5.74)	0.85 (2.16)	1.74 (4.27)									
Purging	T0	3.75 (4.43)	4.28 (6.22)	6.86 (8.58)	14.426 (1,154)	< 0.001	0.086	1.542	0.217	0.020	4.234	0.016	0.552
	T1	3.17 (6.57)	1.65 (3.22)	2.77 (4.75)									
Laxative use	T0	0.50 (1.60)	1.25 (2.53)	0.78 (2.40)	10.647 (1,154)	0.001	0.065	1.411	0.247	0.018	0.239	0.788	0.003
	T1	0.00 (0.00)	0.35 (1.57)	0.11 (0.62)									

Starvation, excessive exercise, binge eating, purging, and laxative use were measured by frequency per week.

T, time; G, group; MET with nutrition, motivational enhancement therapy with nutrition; MANTRA augmented by NMCC, Maudsley Model of Anorexia Nervosa Treatment for Adults augmented by the New Maudsley Model for Collaborative Care; SSCM, Specialist Supportive Clinical Management; BMI, body mass index.

Table 6. Relationship between changes in BMI and baseline clinical variables in the MET with nutrition, MANTRA augmented by NMCC, and SSCM groups

Clinical variables	Patients (n = 153)		
	β	<i>t</i>	<i>p</i>
Age, yr	0.102	0.389	0.698
Onset age, yr	−0.192	−0.837	0.405
Duration, mo	−0.205	−1.028	0.307
BMI	−0.440	−4.614	< 0.001
Starvation	−0.136	−1.185	0.239
Excessive exercise	0.007	0.065	0.949
Binge eating	−0.018	−0.150	0.881
Purging	−0.099	−0.810	0.420
Laxative use	−0.011	−0.110	0.913
EDE-Q, global	0.167	1.447	0.151
DASS-21, total	−0.032	−0.312	0.756
Therapy, session	0.378	3.967	< 0.001

Change in BMI was defined as the difference in BMI measured at the end of the treatment and baseline.

MET with nutrition, motivational enhancement therapy with nutrition; MANTRA augmented by NMCC, Maudsley Model of Anorexia Nervosa Treatment for Adults augmented by the New Maudsley Model for Collaborative Care; SSCM, specialist supportive clinical management; BMI, body mass index; EDE-Q, Eating Disorder Examination Questionnaire; DASS-21, Depression Anxiety Stress Scale-21.

on protocols, and treatment compliance and fidelity were ensured by providing supervision to each therapist and following established manuals. The overall dropout rate was 40.3%, with the SSCM and MANTRA augmented by NMCC groups having lower rates than the MET with nutrition group. The psychotherapies led to BMI increases and reduced eating pathology with large effect sizes in patients with AN. Individuals with a lower baseline BMI and those who attended more sessions experienced greater improvements in BMI across all psychotherapies.

The mean BMI at recruitment in our cohort was 15.89 kg/m², which falls within the severe category according to the DSM-5 severity classification [1]. The BMI increase at the end of treatment was 1.29 kg/m² with no significant differences among the therapies, which corresponded to partial remission. The improvement was not sufficient to reach a normal range of BMI, which might be due to the short duration of treatment. Inadequate responses after psychotherapies, such as CBT, have also been reported in other mental disorders, such as obsessive-compulsive disorder [39]. In our cohort, the average treatment duration was four months, whereas other therapies, such as enhanced cognitive behaviour therapy [40] typically last six months or longer. Considering the differences in inter-

vention length, the BMI increase was comparable to results reported in Western countries over a similar period [41]. Therefore, the effectiveness of treatments in Korean patients with AN may be comparable to that in Western countries, but the high dropout rates might account for the relatively low weight gain at the end of treatment, corresponding to partial remission.

The overall dropout rate of 40.3% was high though it is comparable to a systematic review that concluded that approximately 40% of people receiving psychological treatments for an ED do not complete the full course of treatment [42]. The dropout rate in our study might be related to our stricter definition of dropout (i.e., missing 50% of sessions), considering that other studies used more lenient criteria, such as discontinuing treatment before the fifth session. Additionally, the study was conducted in a real-world setting where patients paid for their treatments, which may have contributed to treatment discontinuation due to financial reasons. The results indicate that retention remains a key challenge when administering the treatments in Korea. Randomized controlled trials (RCTs) are needed to explore treatment factors that contribute to dropout, while controlling for external factors (e.g., cost). SSCM and MANTRA augmented by NMCC had lower dropout rates than MET with nutrition. The personalized approach and involvement of experienced therapists in SSCM may have contributed to the reduced dropout. For MANTRA augmented by NMCC, the involvement of carers is usually associated with better treatment outcomes and greater engagement [12,43], which may enhance overall therapy engagement. Meanwhile, the higher dropout rate in MET with nutrition may be related to the relatively short duration of its therapy protocol compared to the other therapies, which may have reduced patients' engagement and satisfaction. It is worth noting that the MET with nutrition group did not significantly differ in overall outcomes despite having the shortest therapy duration, suggesting that the therapy might be as efficient. Further investigation into integrating MET with other therapies is warranted.

While there were no significant differences in improvements in BMI across therapies, the SSCM group exhibited a greater reduction in the frequency of compensatory behaviors, specifically self-induced vomiting, compared to the MET with nutrition group. This result suggests that SSCM may be more effective in managing complex patho-

logical behaviors (e.g., AN binge-purge type).

Notably, MANTRA augmented by NMCC showed significant improvements in both BMI and ED symptoms, as well as a lower treatment dropout rate. The materials used in MANTRA augmented by NMCC, including an online workbook and a library of video clips, appear to be acceptable to Korean patients with AN. Future studies should include RCTs to evaluate the efficacy of this adapted form of ECHOMANTRA for patients with AN and their families. Such research should explore its use not only in specialized ED units but also as an adjunct to standard ED treatments.

Regarding the factors related to treatment outcomes, the number of sessions and baseline BMI were both associated with BMI increases. This suggests that patients with more severe AN may have greater potential for improvement in BMI. In terms of the association between the number of sessions and treatment outcomes, it should be considered that factors outside of treatment, such as financial burden, lack of time, and long-distance commutes to the clinic, may have influenced the number of sessions. Therefore, providing resources that enable patients to continue therapy, including financial support, may play a pivotal role in treatment outcomes for adult patients in Korean therapeutic settings.

These findings offer insights into clinicians' decision-making, including factors to consider when assigning treatments. For instance, SSCM may be suitable for patients with more complex cases involving frequent use of compensatory behaviors. This is due to the treatment's emphasis on the reversal of starvation through meal plans and self-monitoring [20]. SSCM allows more room for personalization compared to other treatments, which may explain its lower dropout rate. While this is a strength, it also highlights the need for experienced therapists and may require long-term training. MET with nutrition—despite its shorter therapy duration due to a higher dropout rate—showed comparable overall treatment outcomes to other treatments. This suggests the treatment's relatively shorter training period owing to its well-structural protocol, and its potential strength regarding patients' access to treatment. MANTRA augmented by NMCC may be appropriate when family involvement is needed for adult patients.

The present study suggests that adapting Western evidence-based psychological therapies for AN can be effective

in Korean patients with AN. Strengths of the study include a large sample of patients with AN in a real-world clinical setting in Korea. Nevertheless, there are some limitations to consider when interpreting the findings. First, the data were collected retrospectively, which resulted in incomplete and missing data, including secondary outcome measures, highlighting the need for future studies with prospective designs. Second, we were unable to collect follow-up data to determine whether the effects persisted. Future studies should include follow-up assessments to examine treatment sustainability, given the chronic nature of the disorder and the importance of relapse prevention. Third, a range of outcome variables were not included, such as motivation to change, general psychological variables, and quality of life, which may have facilitated a more comprehensive assessment of treatment effectiveness. In line with this, feasibility was assessed based on dropout rates, yet broader measures, such as participant satisfaction would enable a more accurate assessment of feasibility. Fourth, our cohort was recruited from a single institution, although it was representative of ED treatments in the country. Fifth, patients paid for the therapies, which may have motivated active participation but could also have reduced the number of sessions and led to early dropout due to financial burden. Sixth, we assigned patients based on their clinical features in a real-world setting. RCTs are needed to enable more robust data collection by reducing bias and allowing for assessment of comparative effectiveness. Lastly, we were unable to include objective adherence metrics (e.g., audio recordings, session content logs, patient feedback form) to evaluate therapist adherence. Instead, the materials used in therapy and their integration into the treatments were regularly reviewed. Incorporating objective adherence metrics with supervision would enhance treatment fidelity in future studies.

In conclusion, the present study assessed the feasibility and effectiveness of psychological therapies for adults with AN in Korea. The findings showed comparable treatment outcomes in BMI increases across MET with nutrition, MANTRA augmented by NMCC, and SSCM. More personalized approaches by experienced therapists, tailored to the specific needs of patients, appeared to be more acceptable to patients with AN in Korea. Additionally, the library of video clips, including lived experience recovery narratives and role-plays of carer skills in MANTRA aug-

mented by NMCC seemed to be well accepted by Korean patients with AN. While the findings demonstrate promise for application of these treatments in Korean patients with AN, further efforts are needed to improve treatment retention. Studies with prospective designs using RCTs are needed to examine factors that can reduce dropout while controlling for variables outside the treatment itself.

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■ Conflicts of Interest

Seoul Paik Hospital operated between 1941 and 2023. The New Maudsley Health Center for Eating Disorders has no affiliation with Maudsley Hospital, London, UK.

■ Author Contributions

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