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Efficacy of Eating Disorder Focused Family Therapy for Adolescents With Anorexia Nervosa: A Systematic Review and Meta-Analysis

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Keywords: adolescents | anorexia nervosa | children | eating disorders | family therapy | family-based treatment | outcomes

ABSTRACT

Objective: To systematically review and evaluate the efficacy of eating disorder focused family therapy (FT-ED) in comparison to all other forms of psychotherapy for children and adolescents with anorexia nervosa. A secondary aim is to assess the relative efficacy of different variations of FT-ED (e.g., shorter vs. longer dose, parent-focused).

Methods: A search with relevant terms was systematically conducted on four databases. Twenty-three publications across 18 randomized controlled trials met inclusion criteria. Outcomes of interest included variables related to weight, eating psychopathology, and remission status. Study quality was assessed, and data were extracted by two independent researchers.

Results: Adolescents receiving FT-ED gained significantly more weight by the end of treatment in comparison to those receiving individual psychotherapy. FT-ED that was delivered just to parents or to parents and child separately offered preferable weight outcomes and rates of recovery at the end of treatment in comparison to conjoint FT-ED. No other outcomes tested in the meta-analysis were statistically significant at the end of treatment or follow-up.

Discussion: Currently available data suggest the use of FT-ED in its conjoint or separated/parent focused format is the best outpatient treatment option for adolescents with anorexia nervosa when immediate weight gain is paramount. The variability of outcome measurement, including the tools used and timepoints chosen, limit comparison among no more than a handful of studies. The field would benefit from the standardization of measurement and reporting guidelines for future clinical trials.

Trial Registration: PROSPERO number: CRD42023396263.

D. Le Grange and G. Dimitropoulos are joint senior authors.

ABSTRACTO

Objetivo: Revisar y evaluar sistemáticamente la eficacia de la terapia familiar centrada en el trastorno de conducta alimentaria (TF-TCA; FT-ED por sus siglas en inglés) en comparación con todas las demás formas de psicoterapia para niños y adolescentes que padecen anorexia nerviosa. Un objetivo secundario es evaluar la eficacia relativa de diferentes variaciones de la TF-TCA (por ejemplo, dosis más corta vs. más larga, centrada en los padres).

Métodos: Se realizó una búsqueda sistemática con términos relevantes en cuatro bases de datos. Veintitrés publicaciones de 18 ensayos controlados aleatorios cumplieron con los criterios de inclusión. Los resultados de interés incluyeron variables relacionadas con el peso, la psicopatología alimentaria y el estado de remisión. La calidad del estudio fue evaluada y los datos fueron extraídos por dos investigadores independientes.

Resultados: Los adolescentes que recibieron TF-TCA ganaron significativamente más peso al final del tratamiento en comparación con aquellos que recibieron psicoterapia individual. La TF-TCA que se administró solo a los padres o a padres e hijos por separado ofreció mejores resultados en el peso y tasas de recuperación al final del tratamiento en comparación con la TF-TCA conjunta. Ningún otro resultado probado en el metaanálisis fue estadísticamente significativo al final del tratamiento o durante el seguimiento.

Discusión: Los datos disponibles actualmente sugieren que el uso de la TF-TCA en su formato conjunto o separado/centrado en los padres es la mejor opción de tratamiento ambulatorio para adolescentes que padecen anorexia nerviosa cuando la ganancia de peso inmediata es primordial. La variabilidad en la medición de los resultados, incluyendo las herramientas utilizadas y los puntos temporales elegidos, limita la comparación entre no más de un puñado de estudios. El campo se beneficiaría de la estandarización de la medición y las directrices de reporte para futuros ensayos clínicos.

Summary

- This systematic review examines the evidence for eating disorder focused family therapies for adolescents with anorexia nervosa in comparison to all other forms of psychotherapy.
- Eating disorder focused family therapy is generally the first recommended treatment approach for children and adolescents with anorexia nervosa and is endorsed by multiple international clinical guidelines, thus an up-to-date review is required to ensure practice is supported by the evidence.

1 | Introduction

Anorexia nervosa (AN) is a life-threatening and disabling illness which impairs physical health and psychological functioning (Treasure et al. 2020) and has an age- and sex-standardized mortality rate approximately five times higher than the general population (van Eeden, van Hoeken, and Hoek 2021). The onset of AN is typically in adolescence, with 40% of newly diagnosed cases found in those between 15 and 19 years of age (Jagielska and Kacperska 2017). Currently, the universally recommended treatment for adolescents with AN is eating disorder focused family therapy, or FT-ED (e.g., Couturier et al. 2020; Crone et al. 2023; NICE 2017). Treatment outcomes for children and adolescents are critically needed to reduce a prolonged course of illness, and an updated review will help to capture evidence for this first-line approach.

There is a rich history supporting FT-ED, as well as many different terms used to refer to this general approach. Within the context of this review, FT-ED is used to refer to all treatment approaches for families that have developed from the foundational Maudsley model/family therapy for anorexia (FT-AN) which emerged in the 1980s (for details on the origin and evolution of the Maudsley model, please see Baudinet, Simic, and Eisler 2022 and Gorrell, Simic, and Le Grange 2023). A variation of this approach, known as family-based treatment (FBT) was first manualized in the United States more than two decades ago (Lock and Le Grange 2000). A limited number of adaptations to this foundational model have been developed and evaluated, including parent focused treatment (PFT), an FBT-based approach that prioritizes working with parents alone (Le Grange et al. 2016), and FBT approaches of various intensities/durations (Lock et al. 2005). This review will also use the term FT-ED to refer to historical terms for this approach to therapy, including behavioral family therapy (BFT) and behavior family systems therapy (BFST). The common thread of these therapies is the emphasis on parental involvement in addressing disordered eating by supporting the child in achieving weight restoration, reducing eating-disorder related behaviors, and working toward resumption of independent eating (Eisler et al. 2016a; Lock and Le Grange 2015). Across all formats, FT-ED is delivered in a phased approach with an initial focus on managing eating with a later broadening of treatment scope once physical health and normative eating practices are re-established (Baudinet, Simic, and Eisler 2021).

A previous systematic review and meta-analysis by Couturier, Kimber, and Szatmari (2013) examined the efficacy of FT-ED on rates of remission in adolescents with EDs in comparison to individual therapy. A subgroup analysis on AN revealed that there were no significant differences by therapy type at the end of treatment, but that FT-ED became significantly superior in achieving remission (as defined by each original study) at short term follow-up (Couturier, Kimber, and Szatmari 2013). A subsequent review by Fisher et al. (2019) concluded that there was insufficient evidence to determine whether FT-ED was superior to individual therapy. This previous meta-analysis included randomized controlled trials (RCTs) as of April 2016 (Fisher et al. 2019). Since this review, five additional RCTs, including feasibility and pilot studies, have been published (Aarnio-Peterson et al. 2024; Eisler et al. 2016b; Lock et al. 2018, 2021, 2023). Therefore, this systematic review and meta-analyses aims to

examine the updated evidence base to (1) assess the efficacy of FT-ED for adolescents with AN relative to other therapies, and (2) assess the efficacy of different variations of FT-ED (e.g., dose) for adolescents with AN.

2 | Methods

2.1 | Protocol and Study Guidelines

This systematic review and meta-analysis was prospectively registered with PROSPERO and adhered to the Preferred Reporting for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al. 2021). See Table S2 for completed checklist. Database searching for the current review was conducted in compliance with Peer Review of Electronic Search Strategies (PRESS) guidelines (McGowan et al. 2016), in consultation with a medical librarian (DL). Four databases were searched (PsycINFO, MEDLINE, EMBASE, CINAHL) from inception to January 4, 2024. The key words used included three concepts: (1) AN, (2) eating disorder focused family therapy, and (3) RCT. Database searches and the list of key terms are provided in the Supplementary Material (Boxes S1–S3, Table S1). A gray literature search was also conducted across a range of platforms including dissertation/thesis repositories (ProQuest), preprint servers (MedRxiv, PsyArXiv), and clinical trial registries (International Clinical Trials Registry Platform, clinicaltrials.gov). Blinded reviewers performed title/abstract screening and full-text article screening in duplicate. In the event of disagreement, a third reviewer (AGA) was consulted to resolve any discrepancies.

2.2 | Study Selection Criteria

Reviewers selected peer reviewed articles based on the following criteria: (1) research focused on adolescents aged 12–20 years with a clinical diagnosis of AN; (2) studies implementing an RCT design; (3) studies examining FT-ED or related treatment models, for example, Maudsley model/family therapy for anorexia nervosa (FT-AN), family-based treatment (FBT), parent focused treatment (PFT), and behavioral family therapy (BFT); (4) studies examining at least one of the following: an outcome related to weight (e.g., BMI, change in BMI, percent median BMI [%mBMI]), an outcome related to ED psychopathology (e.g., binge/purge frequency, validated eating disorder symptom assessments such as the Eating Disorder Examination), or an outcome measuring remission/recovery (a combination of the previous factors as determined within individual studies). Studies written in any language were eligible for inclusion.

This review excluded articles based on the following criteria: (1) studies focusing primarily on adults or individuals without a clinical diagnosis of AN, (2) study design other than RCTs, including quasi experimental or observational studies, (3) studies examining an alternative intervention for the treatment of AN without comparison to FT-ED, including Structural Family Therapy (Minuchin 1974), Systemic Family Therapy (Kaganski 1999), Strategic Family Therapy (Madanes 2014), or generic family involvement without a theoretical orientation (e.g., parent psychoeducation), and (4) studies examining outcomes other than those listed above in the inclusion criteria (i.e., BMI, ED cognition/behavior related variables, remission/recovery). Companion papers to original RCT reports that did not include additional new data, for example, secondary data analysis of treatment predictors, mediators, or moderators, were also excluded. A list of RCTs which met most but not all of our inclusion criteria, with specific reasons for exclusion, can be found in Table S3.

2.3 | Data Extraction

Data extraction for Table 1 was completed in duplicate. Where extractors disagreed, both reviewers consulted the literature together, and consensus was obtained. Extracted data included the following study and participant characteristics: study citation (i.e., author and year of publication), country, participant characteristics (including sex/gender and race/ethnicity as reported in the original study), type of FT-ED, type of comparator treatment, outcomes relevant to this review, and the superior treatment.

2.4 | Risk of Bias and Quality Assessment

All studies included in this systematic review and meta-analysis were assessed for quality using the Cochrane Collaboration's tool for assessing the risk of bias in RCTs (Higgins et al. 2011). The Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) approach (Balshem et al. 2011) was used to assess the strength of overall evidence. Funnel plot asymmetry was not assessed based on recommendations that these analyses should only be conducted with a minimum 10 studies (Higgins et al. 2023).

2.5 | Data Analysis

Study and participant characteristics, including demographics, treatment models, and relevant outcomes, are presented in a tabular format and summarized narratively. Outcome variables with sufficient data across studies are synthesized via metanalysis using a restricted maximum likelihood approach (REML) to estimate heterogeneity. For dichotomous outcome measures (i.e., remission) risk ratios were calculated. For continuous outcomes, standardized effect sizes (Hedges *g*) were calculated given the variety of outcome measures used. All statistics were performed in STATA version 17.

3 | Results

3.1 | Study Selection

Our initial search of databases and registers yielded 2479 articles, 1119 of which were duplicates. Based on the abstracts of the remaining articles, 156 were assessed for eligibility via full-text review. In total, 23 reports based on 18 studies met inclusion criteria. Further details on the screening process can be found in Figure 1.

3.2 | Participant Characteristics

Across all trials, 1138 patients were randomized. Details on patient sex and/or gender, age, and race and/or ethnicity can be

TABLE 1 | Study and participant characteristics.

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
Aarnio-Peterson et al. 2024	Cincinnati, United States	FBT and support group (FBT + support) vs. FBT and emotion coaching group (FBT + EC)	*N* = 41 Age 12–17, m = 14.9, *SD* = 1.6 DSM-5 AN or AAN 87.8% cisgender male, 9.8% cisgender male, 2.4% transgender White *n* = 40, biracial *n* = 1 Ethnicity: Hispanic *n* = 1 SES NR 89% EBW at baseline 46% medically stabilized prior to entry Exclusion: Developmental disability, previous FBT	Length of planned treatment unspecified, assumed to be 20 FBT sessions (FBT + EC: *M* = 18, FBT + support: *m* = 17) Follow-up: 20 sessions +3 months (duration from baseline NR)	%EBW, Full remission (≥95% mBMI plus EDE within 1 *SD* of community)	%EBW[a] *@EOT* FBT + EC *m* = 94.6, *SD* = 1.3 FBT + support *m* = 94.4, *SD* = 1.8 *d* = 0.03 *b* = 0.17, 95%CI [3.81, 4.16] *@EOT + 3M* FBT + EC *m* = 96.3, *SD* = 1.6 FBT + support *m* = 94.1, *SD* = 2.6 *d* = 0.27 *b* = 2.20, 95%CI [3.38, 7.77] Full remission *@EOT* FBT + EC *n* = 4/10, 40% FBT + support *n* = 3/11, 27% OR = 1.80, CI NR *@EOT + 3M* FBT + EC *n* = 3/7, 43% FBT + support *n* = 4/10, 40% OR = 1.13, CI NR	No significantly superior treatment for %EBW or full remission Study was a feasibility/pilot trial and thus not intended to identify a superior treatment

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
Agras et al. 2014	Multisite, Canada and United States	FBT, $n=78$ vs. Systemic family therapy (SyFT), $n=80$	$N=164$ Age 12–18, $m=15.3$, $SD=1.8$ DSM-IV AN, minus amenorrhea criterion 89.2% female Asian $n=8$, white $n=125$, Hispanic $n=16$, >1 race/ethnicity $n=9$ SES NR 82.2% IBW at baseline (maximum of 87% IBW)	Length of treatment: 36 weeks (~8 M) Follow-up: EOT, 12 M (~20 M post treatment start)	%IBW, EDE, remission (≥95% of IBW)	%IBW *@EOT/8M* FBT $m=92.1$, SyFT $m=91.1$ $d=0.13$, $p=0.31$ *@20M* FBT $m=94.6$, SyFT $m=93.3$ $d=0.14$, $p=0.31$ EDE (log transformed) *@EOT/8M* FBT $m=1.2$, $SD=$ NR, SyFT $m=1.2$, $SD=$ NR $d=-0.18$, $p=0.10$ *@20M* FBT $m=0.8$, $SD=$ NR, SyFT $m=1.1$, $SD=$ NR $d=-0.20$, $p=0.10$ Remission *@EOT/8M* FBT $n=$ NR, 33%, SyFT $n=$ NR, 25% SRD = 0.08, NNT = 13, $p=0.22$ *@20M* FBT $n=$ NR, 41%, SyFT $n=$ NR, 39% SRD = 0.02, NNT = 59, $p=0.84$	No significantly superior treatment

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
Ball, 1998 Ball and Mitchell 2004	Sydney, Australia	Cognitive behavior therapy (CBT), $n=13$ vs. Behavioral family therapy (BFT), $n=12$	$N=25$ Age 13–23, $m=18.69$, $SD=3.0$ DSM-IV AN, up to <90%IBW AN-R $n=16$, AN-B/P $n=9$ 100% female Race/ethnicity NR Upper middle class $n=14$, lower/working class $n=11$ BMI $m=15.63$ at baseline Exclusion: Comorbidity other than anxiety or depression	Length of treatment: 12 M Follow-up: 6 M (18 M post treatment start)	BMI, EDE, MROAS score and adapted remission category (good = within 10% of ABW, no binge/purge, gained 4 kg, regular menses; intermediate = within 10% of ABW, binge/purge <1/week, gained 4 kg; poor = <15% ABW, binge/purge 1+/week)	<u>BMI</u> *@EOT/12 M* CBT $m=18.73$, $SD=1.72$, BFT $m=18.99$, $SD=2.04$ *@18 M* CBT $m=18.55$, $SD=1.78$, BFT $m=19.65$, $SD=2.02$ $F(1,23)=2.48$, $p=0.129$ <u>EDE</u> *@EOT/12 M* CBT $m=2.37$, $SD=2.12$, BFT $m=1.80$, $SD=1.21$ *@18 M* CBT $m=2.41$, $SD=1.97$, BFT $m=1.74$, $SD=0.95$ $F(1,23)=1.16$, $p=0.293$ <u>Remission</u> *@EOT/12 M* CBT: $n=7/9$, 77.8%, BFT: $n=7/9$, 77.8% $X^2=0$. df = 1, $p=1.0$ *@18 M* CBT: $n=7/9$, 77.8%, BFT: $n=7/9$, 77.8% $X^2=0$. df = 1, $p=1.0$	No significantly superior treatment

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
Eisler et al. 2000, 2007	London, United Kingdom	Conjoint family therapy (CFT), $n=19$ vs. Separated family therapy (SFT), $n=21$	$N=40$ DSM-IV or ICD-10 AN Bulimic symptoms ($n=19$) Age 11.5–17.8, $m=15.5$, $SD=1.6$ 97.5% female Race/ethnicity NR Hollingshead's social class: I–II $n=26$, III–V $n=9$, VI–VIII $n=5$ 74.3% ABW at baseline	Length of treatment: 12 M Follow-up: 3, 6, 12 M, 5 years	%ABW, weight (kg), BMI, bulimic symptoms (rated 0–12), MROAS remission category, EDI, EAT	%ABW *@12 M/EOT* CFT: change $m=10.2\%$, $SD=11.3$ SFT: change $m=15.0\%$, $SD=11.0$ $F=2.05$, $p=0.16$ @5 years CFT: $m=91.0\%$, $SD=12.2$; SFT: $m=97.7\%$, $SD=9.32$ $t=-1.76$, $p<0.09$ EAT *@12 M/EOT* CFT: change $m=26.8$, $SD=20.8$ SFT: change $m=29.2$, $SD=24.9$ $F=1.14$, $p=0.30$ Remission (MROAS) *@12 M/EOT* CFT: good $n=5$, intermediate $n=4$, poor $n=10$ SFT: good $n=10$, intermediate $n=6$, poor $n=5$ Good/intermediate vs. poor Fisher's exact $p=0.06$ @5 years CFT: good $n=13$, intermediate $n=1$, poor $n=4$ SFT: good $n=16$, intermediate $n=2$, poor $n=2$ No sig. difference (value NR)	SFT was significantly superior on EAT score at end of treatment. No other statistically significant differences

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
Eisler et al. 2016b	United Kingdom	Family therapy for anorexia (FT-AN), $n=82$ vs. Multifamily therapy (MFT), $n=85$	$N=169$ DSM-IV AN or EDNOS with <86% mBMI of −15% of body weight in last 3 months Age 13–20, $m=15.7$, $SD=1.7$ 91.0% female White $n=151$, other $n=6$, missing $n=10$ SES NR 78.0% mBMI at baseline	Length of treatment: 12 months Follow-up: 3 M, EOT (12 M), 18 M	%mBMI, BMI, EDE (subscales only), MROAS remission category	%mBMI *@12 M* Group diff $m=2.24$ 95% CI [−0.47, 4.95] $t=2.36$, $p=0.105$ *@18 M* Group diff $m=4.11$ 95% CI [0.98, 7.24] $t=2.57$, $p=0.010$ EDE—restraint *@12 M* Group diff $m=0.45$ 95% CI [−0.22, 1.11] $t=1.33$, $p=0.185$ *@18 M* Group diff $m=0.45$ 95% CI [−0.26, 1.15] $t=1.25$, $p=0.213$ EDE—eating concerns *@12 M* Group diff $m=0.14$ 95% CI [−0.46, 0.73] $t=0.44$, $p=0.659$ *@18 M* Group diff $m=0.18$ 95% CI [−0.42, 0.78] $t=0.59$, $p=0.559$ EDE—shape concerns *@12 M* Group diff $m=0.54$ 95% CI [−0.18, 1.26] $t=1.48$, $p=0.139$ *@18 M* Group diff $m=0.56$ 95% CI [−0.20, 1.31] $t=1.44$, $p=0.150$ EDE—shape concerns *@12 M* Group diff $m=0.44$ 95% CI [−0.27, 1.14] $t=1.22$, $p=0.223$ *@18 M* Group diff $m=0.49$ 95% CI [−0.31, 1.29] $t=1.21$, $p=0.226$ Remission (MROAS) *@3M*	MFT was significantly superior for %mBMI at 18 M follow-up MFT was significantly superior for remission at end of treatment, but this fell below statistical significance at 18 M follow-up

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
						FT-AN: poor n = NR, 65%, intermediate n = NR, 27%, good n = NR, 9% MFT: poor n = NR, 58%, intermediate n = NR, 27%, good n = NR, 15% *@EOT/12M* FT-AN: poor n = NR, 42%, intermediate n = NR, 33%, good n = NR, 25% MFT: poor n = NR, 24%, intermediate n = NR, 33%, good n = NR, 43% Good/intermediate marginal OR = 2.55 95% CI [1.17, 5.52] in favor of MFT t = 2.36, p = 0.018 *@18M* FT-AN: poor n = NR, 4%, intermediate n = NR, 24%, good n = NR, 33% MFT: poor n = NR, 22%, intermediate n = NR, 33%, good n = NR, 45% Good/intermediate marginal OR = 2.01 95% CI [0.91, 4.45] in favor of MFT t = 1.72, p = 0.086	

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
Herscovici, Kovalskys, and Orellana 2017	Argentina	Family therapy (FT), $n=12$ vs. FT with family meal (FTFM), $n=11$	$N=23$ Age 12–20, $m=17.1$, $SD=2.3$ Great Ormond Street operational definition of AN (Bryant-Waugh 2000) Bulimic symptoms ($n=8$) 95.7% female, 4.3% male Race/ethnicity NR SES: Lower $n=3$, middle $n=10$, upper middle $n=3$, upper $n=7$	Length of treatment: 6 M Follow-up: EOT, 12 M	%EBW, EDI-2, MROAS score and remission category, weight remission	%EBW *@EOT/6 M* FT $m=82.9\%$, $SD=7.1$, FTFM $m=86.6\%$, $SD=10.3$ *@12 M* FT $m=86.4\%$, $SD=13.3$ FTFM $m=91.7\%$, $SD=10.5$ Effect = 0.05, 95% CI [−0.03, 0.12], $p=0.235$ EDI-2 *@EOT/6 M* FT $m=4.6$, $SD=3.3$ FTFM $m=6.9$, $SD=3.5$ *@12 M* FT $m=4.4$, $SD=3.2$ FTFM $m=6.5$, $SD=4.2$ Effect = 2.73, 95% CI [0.34, 5.12], $p=0.026$ Remission (MROAS) *@baseline* FT: poor $n=12/12$ FTFM: intermediate $n=3/11$, poor $n=8/11$ *@6 M* FT: good $n=3/12$, intermediate $n=2/12$, poor $n=7/12$ FTFM: good $n=6/11$, intermediate $n=4/11$, poor $n=1/11$ *@12 M* FT: good $n=4/12$, intermediate $n=2/12$, poor $n=6/12$ FTFM: good $n=6/9$, intermediate $n=2/9$, poor $n=1/9$	No significantly superior treatment

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
Le Grange et al. 1992	London, United Kingdom	FBT, $n=10$ vs. Family counseling (FC, supportive sessions for patient, counseling for parents), $n=8$	$N=18$ Age 12–17, $m=15.33$, $SD=1.81$ DSM III AN Bulimic symptoms ($n=4$) 88.9% female, 11.1% male Race/ethnicity NR SES NR 77.9% ABW at baseline <3 years illness duration	Length of treatment: 6 M Follow-up: 7 M	%ABW, EAT, MROAS score only	%ABW *@7M* FBT $m=89.1\%$, $SD=13.5$ FC $m=100.4\%$, $SD=9.1$ EAT *@7M* FBT $m=16.6$, $SD=12.1$ FC $m=15.6$, $SD=9.5$	No between group analysis was performed on outcomes

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
Le Grange et al. 2016	Melbourne, Australia	FBT, $n=55$ vs. Parent-focused therapy (PFT), $n=51$	$N=107$ Age 12–18, $M=15.5$, $SD=1.5$ DSM-IV AN, minus amenorrhea criterion 87.7% female Race/ethnicity NR, 92.5% Australian born SES NR 81.9% mBMI at baseline (BMI $m=16.5$) $n=39$ (36.8%) hospitalized prior to study Inclusion: ≤90% mBMI and ≤75th percentile for height or <95% mBMI and ≥75th percentile for height	Length of treatment: 6 M Follow-up: EOT, 6 M, 12 M (12 M and 18 M post treatment start)	%mBMI, EDE, remission (≥95% mBMI plus EDE within 1 *SD* of community)	%mBMI *@EOT/6 M* PFT $m=93.9$, $SD=10.4$, FBT $m=90.7$, $SD=8.7$ X^2 NR, $p=0.166$ *@12 M* PFT $m=95.0$, $SD=11.4$, FBT $m=92.8$, $SD=9.9$ X^2 NR, $p=0.456$ *@18 M* PFT $m=95.6$, $SD=10.0$, FBT $m=93.9$, $SD=9.7$ X^2 NR, $p=0.603$ EDE *@EOT/6 M* PFT $m=0.81$, $SD=1.22$, FBT $m=1.10$, $SD=1.32$ X^2 NR, $p=0.255$ *@12 M* PFT $m=0.74$, $SD=1.01$, FBT $m=0.98$, $SD=1.28$ X^2 NR, $p=0.858$ *@18 M* PFT $m=0.81$, $SD=1.13$, FBT $m=1.04$, $SD=1.24$ X^2 NR, $p=0.965$ Remission *@EOT/6 M* PFT $n=22$ (43.1%), FBT $n=12$ (21.8%) Wald $X^2=5.85$, df = 1, $p=0.016$; OR = 3.03, 95% CI [1.23, 7.46] *@12 M* PFT $n=20$ (39.2%), FBT $n=12$ (21.8%) Wald $X^2=3.75$, df = 1, $p=0.053$; OR = 2.48, 95% CI [0.989, 6.22] *@18 M* PFT $n=19$ (37.3%), FBT $n=16$ (29.1%) Wald $X^2=0.59$, df = 1, $p=0.444$; OR = 1.39, 95% CI [0.60, 3.21]	PFT had significantly superior rates of remission at EOT, but this was not maintained through follow-up

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
Lock et al. 2005 Lock et al. 2006	Stanford, United States	Long-term FBT (FBT-long), $n=42$ vs. Short-term FBT (FBT-short), $n=44$	$N=86$ ($n=71$ at long-term follow-up) Age 12–18, $m=15.2$ DSM-IV, although some partially weight restored 89.5% female, 10.5% male Asian $n=8$, white $n=64$, Hispanic $n=10$, Native American $n=1$, other (NR) $n=3$ Family income: <50 K $n=8$, 50-100 K, $n=32$, >100 K $n=44$, missing $n=2$ BMI $m=17.1$ at baseline $n=26$ (30%) briefly hospitalized prior to study ($m=12.3$ days) 90% had previous AN treatment	Length of treatment: FBT-short = 6 M FBT-long = 12 M Follow-up: 6 M, 12 M (for FBT-short, 6 M is EOT, for FBT-long, 12 M is EOT), 3.96 years (range 2.3–6.0)	BMI, EDE (subscale scores only), BMI remission category (BMI <17.5, BMI >17.5 but <20.0, BMI >20), %IBW remission category (IBW <85%, IBW >85% but <90%, IBW >90%)	BMI *@6M (EOT for FBT-short)* FBT-long $m=19.0$, $SD=1.8$ FBT-short $m=19.0$, $SD=2.3$ *@12M (EOT for FBT-long)* FBT-long $m=19.5$, $SD=2.1$ FBT-short $m=19.5$, $SD=2.2$ ES = −0.26, 95% CI [−0.68, 0.17], AUC 43% *@3.96 years* FBT-long $m=20.74$, $SD=2.25$ FBT-short $m=20.57$, $SD=2.03$ ES = 0.08, 95% CI [−0.39, 0.54], AUC 52% EDE[b] *@3.96 years* FBT-long $m=0.91$, $SD=1.04$ FBT-short $m=1.34$, $SD=1.36$ ES = 0.35, 95% CI [−0.33, 1.01], AUC 60% %IBW remission category *@3.96 years* %IBW < 85: FBT-short $n=3/37$; FBT-long $n=1/34$ %IBW >85 but <90: FBT-short $n=2/37$, FBT-long $n=2/34$ %IBW > 90: FBT-short $n=32/37$, FBT-long $n=31/34$	No significantly superior treatment

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
Lock et al. 2010 Le Grange et al. 2014[b]	Chicago and Stanford, United States	FBT, $n=61$ vs. Adolescent focused therapy (AFT), $n=60$	$N=121$ ($n=79$ at long-term follow-up) Age 12–18, $m=14.4$, $SD=1.6$ DSM-IV, minus amenorrhea criterion 90.9% female Race/ethnicity: Asian $n=13$, Black $n=1$, white $n=92$, Hispanic $n=9$, other (NR) $n=6$ SES NR 82% IBW at baseline (BMI = 16.1) Exclusion: %IBW > 86, previous FBT or AFT	Length of treatment: 12 M Follow-up: EOT 6 M, 12 M (18 and 24 post treatment start), 2–4 years, $m=3.26$ years, $SD=1.29$ (3–5 years post treatment start)	BMI percentile, %EBW (long-term follow-up only), EDE, Remission (Full = 95% EBW and EDE within 1 *SD* of community norm; partial = >85% expected IBW) relapse from full remission (long-term follow-up only)	<u>BMI percentile</u> *@EOT* FBT: $m=31.4\%$, SE = 2.8; AFT $m=23.4$, SE = 2.8 Adjusted mean difference = 8.0, 95% CI [0.1, 15.9] $t(117)=2.0$, $p=0.048$ *@18 M* FBT $m=31.4\%$, SE = 3.5; AFT $m=29.1\%$, SE = 3.4 Adjusted mean difference = 2.3, 95% CI [−7.4, 12.0] $t(117)=0.5$, $p=0.640$ *@24 M* FBT: $m=32.3\%$, SE = 3.4; AFT $m=29.0\%$, SE = 3.4 Adjusted mean difference = 3.2, 95% CI [−6.4, 12.8] $t(117)=0.7$, $p=0.510$ <u>EDE</u> *@EOT* FBT: $m=0.71$, SE = 0.16; AFT $m=1.20$, SE = 0.15 Adjusted mean difference = −0.49, 95% CI [−0.93, −0.06] $t(117)=-2.2$, $p=0.027$ *@18 M* FBT $m=0.78$, SE = 0.17; AFT $m=1.01$, SE = 0.16 Adjusted mean difference = −0.24, 95% CI [−0.70, 0.22] $t(117)=-1.0$, $p=0.307$ *@24 M* FBT: $m=0.79$, SE = 0.16; AFT $m=1.04$ SE = 0.16 Adjusted mean difference = −0.25, 95% CI [−0.69, 0.19] (117) = 1.1, $p=0.263$	FBT had significantly superior BMI percentile, EDE scores, and partial or full remission rates at EOT but not at follow-ups FBT had significantly superior rates of full remission at follow-up timepoints but not at EOT

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
						Partial or full remission *@EOT* FBT: $m = 89.1\%$, SE = 9.3; AFT $m = 66.9\%$, SE = 7.4 Adjusted mean difference = 22.2%, 95% CI [3.9, 30.3] $t(106) = 2.3$, $p = 0.023$ *@18M* FBT $m = 82.0\%$, SE = 8.6; AFT $m = 73.7\%$, SE = 7.9 Adjusted mean difference = 8.3%, 95% CI [−9.5, 19.2] $t(106) = 1.0$, $p = 0.316$ *@24M* FBT: $m = 77.7\%$, SE = 8.9; AFT $m = 75.3\%$, SE = 7.6 Adjusted mean difference = 2.3%, 95% CI [−16.3, 14.9] $t(106) = 0.3$, $p = 0.779$ Relapse from full remission[c] FBT: $n = 1/22$ (4.5%), AFT $n = 1/11$, (9.1%) No main effect of treatment: Wald $chi^2 = 0.320$, df = 1, $p = 0.57$, OR = 0.443	

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
Lock et al. 2015	Chicago and Stanford, United States	FBT, $n=10$ vs. adaptive FBT (FBT + intensive parental coaching [IPC] if required), $n=35$	$N=45$ Age 12–18, $m=14.6$, $SD=1.4$ DSM-IV, minus amenorrhea criterion 91.4% female, 7.93% male Asian $n=5$, white $n=37$, more than 1 race $n=3$ Hispanic $n=1$ SES NR 82.4% IBW at baseline Exclusion: previous FBT	Length of treatment: 6 M	%EBW, BMI, EDE, remission (%EBW ≥95)	%EBW *@EOT/6 M* FBT $m=96.5\%$, $SD=4.7$; FBT/IPT $m=95.7\%$, $SD=7.2$ $t=$NR, $p=0.76$ EDE (transformed) *@EOT/6 M* FBT $m=0.3$, $SD=0.4$; FBT/IPT $m=1.1$ $SD=1.4$ $t=$NR, $p=0.14$ Remission *@EOT/6 M* FBT $n=5/8$, 63.0%; FBT/IPT $n=17/33$, 51.5% X^2 NR, $p=0.58$	Authors did not assert treatment superiority because the study was not powered to determine a superior treatment
Lock et al. 2018	Stanford, United States	Art therapy + FBT (AT + FBT), $n=15$ vs. Cognitive remediation therapy +FBT (CRT + FBT), $n=15$	$N=30$ Age 12–18, $m=14.49$, $SD=1.64$ DSM-IV, minus amenorrhea criterion 90% female Asian $n=5$, white $n=18$, more than one race $n=7$ Ethnicity: Hispanic $n=9$ SES NR 16.35% EBW at baseline Exclusion: previous FBT, CRT, or AT	Length of treatment: 9 M Follow-up: EOT (9 M)	%EBW, BMI, EDE	%EBW *@EOT* AT + FBT: mean change = 8.77, $SD=6.22$, CRT + FBT: mean change = 6.39, $SD=5.10$ $d=0.44$, 95% CI [−0.42, 1.30], $p=0.32$ EDE Significantly different scores at baseline $t(28)=2.26$, $p=0.03$ *@EOT* AT + FBT: mean change = −0.08, $SD=0.05$ CRT + FBT: mean change = −0.03, $SD=0.03$ $d=1.21$, 95% CI [0.27, 2.15], $p=0.03$	No statistically significant difference between treatments Study was a feasibility/pilot trial and thus not intended to identify a superior treatment

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
Lock et al. 2021	Hamilton, Canada + Stanford, United States	FBT-video conference (FBT-V), $n=20$ vs. Guided self-help FBT (GSH-FBT), $n=20$	$N=40$ Age 12–18 14.88, $SD=1.81$ DSM-5 AN 85% female Asian $n=2$, white $n=35$, more than one race $n=2$, missing $n=1$ Hispanic $n=4$, non-Hispanic Household income: <50 K $n=11$, 51-80 K $n=6$, 81-100 K $n=5$, 101-150 K $n=12$, >150 K $n=5$, missing $n=1$ 58% ($n=23$) hospitalized for medical stability prior to trial	Length of treatment: FBT-V: 15 sessions, 9 M, GSH-FBT: 12 sessions, 4-6 M Follow-up: EOT (9 M for FBT-V, 4-6 M for GSH-FBT), 3 M (12 M post treatment start for FBT-V, 6-8 M post treatment start for GSH-FBT)	BMI, %EBW, EDE, remission (≥95% EBW and EDE within 1 *SD* of community norm)	%EBW *@EOT* FBT-V: $m=92.97\%$, $SD=7.33$ GSH-FBT $m=90.80\%$, $SD=7.16$ $d=0.31$ [−2.99, 3.62] *@6-8 M (GSH-FBT)/12 M (FBT-V)* FBT-V: $m=94.11\%$, $SD=8.85$ GSH-FBT $m=93.10\%$, $SD=6.78$ Between group $d=0.13$ [−3.85, 3.26] EDE *@EOT* FBT-V: $m=1.56$, $SD=1.61$ GSH-FBT $m=1.54$, $SD=1.30$ Between group $d=0.01$ [−0.75, 0.65] *@6–8 M (GSH-FBT)/12 M (FBT-V)* FBT-V: $m=1.79$, $SD=1.71$ GSH-FBT $m=1.41$, $SD=1.24$, Between group $d=0.26$ [−0.55, 0.89] Remission *@EOT* FBT-V: 6/18 (30%); GSH-FBT: 2/18 (11%) *@6–8 M (GSH-FBT)/12 M (FBT-V)* FBT-V: 4/20 (20%); GSH-FBT: 4/18 (22.2%)	No significantly superior treatment

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
Lock et al. 2023	Stanford and San Francisco, United States	FBT, $n=34$ vs. FBT + intensive parental coaching (FBT + IPC), $n=35$	$N=69$[d] Age 12–18, $m=14.7$, $SD=1.6$ DSM 5 AN 92.8% female, 7.2% male Asian $n=11$, Black or African American $n=3$, Multiracial $n=11$, white $n=43$, other (NR) $n=1$ Hispanic $n=8$, non-Hispanic $n=61$ SES NR 75% previously hospitalized for AN	Length of treatment: 9 M Follow-up: 3 M, EOT/9 M, 15 M, 21 M	%EBW, EDE, weight remission (BMI > 94%), "recovery" (BMI > 94%, EDE within 1 *SD* of community)	%EBW *@EOT/9 M* FBT: $m=93.28\%$, 95% CI [90.23, 96.03] FBT + IPC: $m=92.56\%$, 95% CI [90.20, 94.92] Group diff $m=0.72$, $d=0.15$, $p=0.67$ *@15 M* FBT: $m=94.21\%$, 95% CI [91.78, 96.65] FBT + IPC: $m=92.71\%$, 95% CI [89.10, 96.32] Group diff $m=1.50$, $d=0.31$, $p=0.50$ *@21 M* FBT: $m=95.37\%$, 95% CI [93.14, 97.60] FBT + IPC: $m=92.62\%$, 95% CI [89.30, 95.93] Group diff $m=2.75$, $d=0.57$, $p=0.18$ EDE *@EOT/9 M* FBT: $m=1.47$, 95% CI [0.88, 2.07] FBT + IPC: $m=1.76$, 95% CI [1.09, 2.42] Group diff $m=-0.28$, $d=-0.18$, $p=0.53$ *@15 M* FBT: $m=1.00$, 95% CI [0.54,1.47] FBT + IPC: $m=1.81$, 95% CI [1.22, 2.41] Group diff $m=-0.81$, $d=-0.52$, p = 0.04 *@21 M* FBT: $m=1.04$, 95% CI [0.55, 1.53] FBT + IPC: $m=1.65$, 95% CI [1.06, 2.25] Group diff $m=-0.611$, $d=-0.40$, $p=0.12$ Recovery *@EOT/9 M* FBT: $m=0.41$, 95% CI [0.25, 0.58] FBT + IPC: $m=0.23$, 95% CI [0.11, 0.40] RD = 0.19, 95% CI [−0.06, 0.38], $p=0.13$ *@15 M* FBT: $m=0.55$, 95% CI [0.37, 0.72] FBT + IPC: $m=0.19$, 95% CI [0.07, 0.38] RD = 0.35, 95% CI [0.10, 0.46], $p=0.008$ *@21 M* FBT: $m=0.58$, 95% CI [0.39, 0.75] FBT + IPC: $m=0.27$, 95% CI [0.13, 0.46] RD = 0.30, 95% CI [0.04, 0.44], $p=0.024$	In the context of patients who do not respond early to treatment, FBT was superior to FBT + IPC on rates of full remission at short-term follow ups

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
Madden et al. 2015	Sydney, Australia	Hospital medical stabilization + FBT (MS + FBT), $n = 41$ vs. Hospital weight restoration + FBT (WR + FBT), $n = 41$	$N = 82$ DSM-IV AN AN-R $n = 57$, AN-B/P $n = 25$ Age 12–18, $m = 14.89$, $SD = 1.46$ 95.1% female, 4.9% male Asian $n = 10$, white $n = 68$, other (NR) $n = 4$ SES NR 78.26% EBW at baseline <3years illness duration	Length of treatment: MS + FBT = average 21.7 inpatient days +20 outpatient sessions WR + FBT = average 36.9 inpatient days +20 outpatient sessions Follow-up: Hospital admission, hospital discharge, EOT/session 20, 6 and 12 M post EOT (duration from baseline NR)	%EBW, EDE, partial remission (>85% EBW), full remission (>95% EBW plus EDE within 1 *SD* of community)	%EBW *@Session 20/EOT* MS + FBT: $m = 95.20\%$, WR + FBT: $m = 93.10\%$ Group diff = −2.2, 95% CI [−5.8, 1.5], $d = 0.27$, $p = 0.24$ *@6 M from EOT* MS + FBT: $m = 93.90\%$, WR + FBT: $m = 93.70\%$ Group diff = −0.2, 95% CI [−4.4, 4.0], $d = 0.02$, $p = 0.92$ *@12 M from EOT* MS + FBT: $m = 95.50\%$, WR + FBT: $m = 93.60\%$ Group diff = −1.9, 95% CI [−6.1, 2.4], $d = 0.19$, $p = 0.39$ EDE *@Session 20/EOT* MS + FBT: $m = 2.12$, WR + FBT: $m = 2.22$ Group diff = 0.10, 95% CI [−0.50, 0.70], $d = 0.07$, $p = 0.74$ *@6 M from EOT* MS + FBT: $m = 1.89$ WR + FBT: $m = 1.93$ Group diff = 0.05, 95% CI [−0.45, 0.54], $d = 0.04$, $p = 0.86$ *@12 M from EOT* MS + FBT: $m = 1.73$, WR + FBT: $m = 2.01$ Group diff = 0.28, 95% CI [−0.33, 0.89], $d = 0.19$, $p = 0.36$ Remission (partial or full) *@Session 20/EOT* MS + FBT: 88.9%, WR + FBT: 97.0% Group diff = 8.1, 95% CI [−3.7, 19.9], NNT = 12, $p = 0.18$ *@6 M from EOT* MS + FBT: 82.5%, WR + FBT: 87.2% Group diff = 4.7, 95% CI [−11.1, 20.5], NNT = 21, $p = 0.56$ *@12 M from EOT* MS + FBT: 90.0%, WR + FBT: 85.0% Group diff = −5.0, 95% CI [−19.5, 9.5], NNT = 20, $p = 0.50$	No significantly superior treatment for the relevant outcomes, although MS + FBT would be more cost effective

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
Rhodes et al. 2008	Sydney, Australia	FBT ($n=10$) vs. FBT + one session parent-to-parent consultation ($n=10$)	$N=20$ Age 12–16 ($m=14$) DSM IV-TR 100% female Race/ethnicity NR SES NR Post inpatient (FBT $m=42$ days, FBT+ $m=44$) 82.53% IBW at inpatient discharge Depression ($n=3$), OCD ($n=5$)	Length of treatment: 20 sessions, duration NR Follow-up: EOT	%IBW, MROAS remission category	%IBW *@EOT* FBT: $m=92.35\%$, *SD* NR; FBT+: $m=90.91\%$, *SD* NR Remission *@EOT* FBT: good $n=5$, intermediate $n=3$, poor $n=2$ FBT+: good $n=4$, intermediate $n=3$, poor $n=3$	No statistically significant difference between treatments, i.e., the addition of one parent to parent consultation session did not impact outcomes

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
Robin et al. 1999	Michigan, United States	Behavioral family systems therapy (BFST), $n=19$ vs. ego-oriented individual therapy (EOIT), $n=18$	$N=37$ Age 11–20 (BFST $m=14.9$, EOIT $m=13.4$) DSM III-R AN 100% female White $n=35$, middle eastern $n=2$ Hollingshead social class: BFST $m=45.7$, $SD=13.6$; EOIT $m=47.9$, $SD=12.0$. Frequencies NR Baseline weight (lbs): BFST $m=86.5$, EOIT $m=86.6$ Illness duration <1 year	Length of treatment: 16 M (range 14–18, $m=15.9$) Follow-up: 12 M (28 M post treatment start)	BMI, achievement of target weight, achievement of 25th BMI percentile for age, achievement of 50th BMI percentile for age, menstruation, EAT[e]	<u>BMI</u> *@EOT/16 M* BFST: $m=19.9$, $SD=1.9$, mean change = 4.7 EOIT: $m=18.9$, $SD=1.9$, mean change = 2.3 $F(1,34)=12.6$, $p<0.001$ *@28 M timepoint* BFST $m=20.7$, $SD=2.7$, mean change NR EOIT $m=19.8$, $SD=3.1$, mean change NR $F(1,28)=6.4$, $p<0.02$ <u>Achievement of target weight</u> *@EOT/16 M* BFST: 66.7%, EOIT: 68.8% X^2 non-sig (value NR) *@28 M* BFST: 80%, EOIT: 68.8% X^2 non-sig (value NR) <u>EAT</u> *@EOT/16 M* BFST: $m=11.6$, $SD=13.6$, EOIT: $m=7.9$, $SD=9.6$ @28 M BFST: $m=8.1$, $SD=10.0$, EOIT: $m=4.7$, $SD=6.1$ $F(1,27)=51.4$, $p<0.001$	BFST was significantly superior to EOIT for BMI at EOT and follow-up No other differences were statistically significant

(Continues)

TABLE 1 | (Continued)

Study	Location	Treatment	Participants	Timepoints	Relevant outcomes	Key findings	Superior treatment
Russell et al. 1987 Eisler et al. 1997 Adolescent subgroup only	London, United Kingdom	Family therapy (FT), $n=10$ vs. individual therapy (IP), $n=11$	$N=21$ Age 14+, $M=16.6$, $SD=1.7$ DSM-III-R AN Sex NR for adolescent subgroup Race/ethnicity NR SES NR by subgroup 66.0% ABW at inpatient admission, 88.9% ABW at inpatient discharge Age of onset <18 years, <3 years illness duration Post inpatient ($m=10.3$ weeks)	Length of treatment: 12 M Follow-up: EOT, 5 years	%ABW, MROAS score and remission category	%ABW *@EOT* FT: $m=92.8\%$, $SD=8.4$; IP: $m=80.1\%$, $SD=15.1$ t test value NR, $p<0.01$ Compared to initial inpatient admission, FT gained more (25.5%) compared to IP (15.5%), $p<0.01$ Compared to inpatient discharge, FT gained 3.4%, IP lost 8.3%, $p<0.01$ *@ 5year* FT: $m=103.4\%$, $SD=13.2$; IP: $m=94.4$, $SD=16.8$ $t=1.32$, $p=0.21$ MRS category *@EOT* FT: good $n=6$, intermediate $n=3$, poor $=1$ IP: good $n=1$, intermediate $n=1$, poor $n=9$ Good vs. intermediate/poor: Fisher's exact $p<0.02$ Good/intermediate vs. poor: Fisher's exact $p<0.002$ *@ 5years* FT: Good $n=9$, intermediate $n=0$, poor $=1$ IP: good $n=4$, intermediate $n=2$, poor $n=5$ Good vs. intermediate/poor: Fisher's exact $p<0.02$ Good/intermediate vs. poor: NR	FT significantly superior to individual therapy at EOT on %ABW, MRS score, and MRS category FT significantly superior to individual therapy at 5 years on MRS score and MRS category but not on %ABW

Abbreviations: ABW, average body weight; AFT, adolescent focused therapy; AN, anorexia nervosa; AT + FBT, art therapy and FBT; BFST, behavioral family systems therapy; BFT, behavioral family therapy; BMI, body mass index; CBT, cognitive behavioral therapy; CFT, conjoint family therapy; CRT + FBT, cognitive remediation therapy and FBT; DSM, Diagnostic and Statistical Manual of Mental Disorders; EAT, Eating Attitudes Test; EBW, expected body weight; EDE, Eating Disorder Examination; EDI, eating disorder inventory; EDNOS, eating disorder not otherwise specified; EOIT, ego-oriented individual therapy; EOT, end of treatment; FBT + EC, FBT with emotion coaching; FBT, family-based treatment; FBT-IPC, FBT with intensive parental coaching; FBT-V, FBT-video conference; FC, family counseling; FT, family therapy; FT-AN, family therapy for anorexia; FTFM, family therapy with family meal; GSH-FBT, guided self-help FBT; IBW, ideal body weight; ICD, International Classification of Disease; IP, individual therapy; M, months; mBMI, median BMI; MFT, multifamily therapy; MROAS, Morgan-Russell Outcome Assessment Scale; MS + FBT, medical stabilization and FBT; NNT, number needed to treat; NR, not reported; PFT, parent-focussed therapy; RD, rate difference; SES, socioeconomic status; SFT, separated family therapy; SRD, sum of ranking differences; SyFT, systemic family therapy; WR + FBT, weight restoration and FBT.

[a]Means presented for Aarnio-Peterson et al. (2024) are marginal estimates adjusted for baseline %EBW.

[b]Only 53 patients completed the EDE at long-term follow-up (FBT-short $n=20$, FBT-long $n=10$).

[c]This long-term follow-up represents a convenience sample (not a random sample). Relapse is measured from full remission at 12-month follow-up (24 months post-treatment), with $n=33$.

[d]One hundred and seven participants were recruited into the initial study. Sixty-nine were considered to be non-early responders, which were then randomized.

[e]EAT scores were reported by adolescent, mother, and father. Adolescent values are reported here.

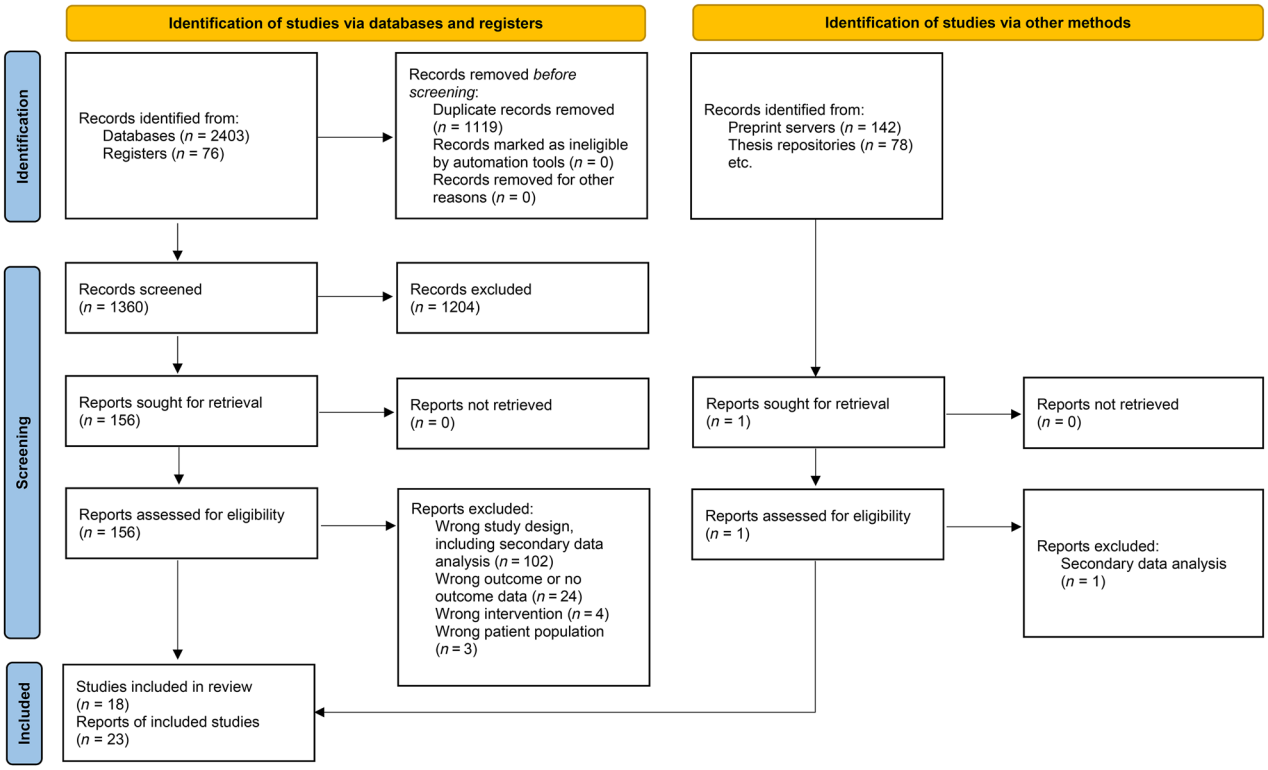

FIGURE 1 | PRISMA flow diagram.

found in Table 1. All studies treated children and adolescents under the age of 20, apart from Ball and Mitchell (2004), which treated individuals between the age of 13 and 23. All studies but one (Aarnio-Peterson et al. 2024) reported gender using a binary approach, with most adolescents classified as female. The race and/or ethnicity of patients were reported in 11 studies, or 61% (Aarnio-Peterson et al. 2024; Agras et al. 2014; Eisler et al. 2016b; Lock et al. 2005, 2010, 2015, 2018, 2021, 2023; Madden et al. 2015; Robin et al. 1999), with the majority of patients identifying as white. Socioeconomic status was reported in seven studies, or 39% (Ball and Mitchell 2004; Eisler et al. 2000; Herscovici, Kovalskys, and Orellana 2017; Lock et al. 2005, 2021; Robin et al. 1999; Russell et al. 1987).

3.3 | Study Characteristics

Reports included in this review were published between 1987 and 2024. The majority of studies were conducted in the United States ($n=7$, 39%), the United Kingdom ($n=4$, 22%), Australia ($n=4$, 22%), joint Canada/United States ($n=2$, 11%), and Argentina ($n=1$, 6%). Measurements used to assess ED psychopathology included the Eating Disorder Examination (EDE; Fairburn, Cooper, and O'Connor 1993) in 12, or 67%, of studies (Aarnio-Peterson et al. 2024; Agras et al. 2014; Ball and Mitchell 2004; Eisler et al. 2016b; Le Grange et al. 2016; Lock et al. 2005, 2010, 2015, 2018, 2021, 2023; Madden et al. 2015), the Eating Attitudes Test (EAT; Bohr et al. 1982) in two, or 11%, of studies (Le Grange et al. 1992; Robin et al. 1999), the Eating Disorder Inventory (EDI; Garner, Olmstead, and Polivy 1983) in one study, or 6% (Herscovici, Kovalskys, and Orellana 2017), and both the EDI and the EAT in one study, or 6% (Eisler et al. 2000). One study (6%) used the Morgan-Russell Outcome Assessment Schedule (MROAS; Hayward and Morgan 1988) nutritional subscale (Russell et al. 1987), and one study (6%) did not report eating disorder psychopathology (Rhodes et al. 2008).

Weight outcomes were also reported in various ways. These included BMI in three studies, or 17% (Ball and Mitchell 2004; Lock et al. 2005; Robin et al. 1999), percentage of ideal body weight (%IBW) in two studies, or 11% (Agras et al. 2014; Rhodes et al. 2008), percentage of expected body weight (%EBW) in five studies, or 28% (Aarnio-Peterson et al. 2024; Herscovici, Kovalskys, and Orellana 2017; Lock et al. 2015, 2023; Madden et al. 2015), percentage of average body weight (%ABW) in two studies, or 11% (Le Grange et al. 1992; Russell et al. 1987), and %mBMI in one study, or 6% (Le Grange et al. 2016). Five studies (28%) reported weight in multiple formats, including %ABW and BMI (Eisler et al. 2000), %mBMI and BMI (Eisler et al. 2016b), %EBW and BMI percentile (Lock et al. 2010), and %EBW and BMI (Lock et al. 2018, 2021).

Remission was reported using the MROAS in six studies, or 33% (Eisler et al. 2000, 2016b; Herscovici, Kovalskys, and Orellana 2017; Le Grange et al. 1992; Rhodes et al. 2008; Russell et al. 1987). The MROAS (Hayward and Morgan 1988) categorizes outcome into the following three categories: Good (body weight within 15% of ABW and regular menstrual cycles), intermediate (body weight within 15% of ABW but amenorrhea), and poor (<15% ABW or bulimic symptoms developed). Ball and Mitchell (2004) also used the MROAS but added an additional criterion of gaining 4 kg to reach an intermediate or good outcome. Remission was also conceptualized as ≥95%IBW (Agras et al. 2014), ≥95%EBW (Lock et al. 2015), ≥95% mBMI plus EDE within one standard deviation of community norms (Le Grange et al. 1992), and ≥95% EBW plus EDE within one standard deviation of community norms (Aarnio-Peterson et al. 2024; Lock

TABLE 2 | Data collection timepoints across all trials, specifying end of treatment (EOT).

	3M	4–6M	6M	7M	6–8M	8M[b]	20 sessions	9M	12M	20 sessions + 3 months	15M	16M	18M	20 sessions + 6 months	20M	21M	24M	20 sessions + 12 months	28M	3.3 years[c]	4 years[d]	5 years
Aarnio-Peterson et al. 2024							X (EOT)			X												
Agras et al. 2014						X (EOT)									X							
Ball 1998 Ball and Mitchell 2004									X (EOT)				X									
Eisler et al. 2000, 2007	X		X						X (EOT)													X
Eisler et al. 2016b	X								X (EOT)				X									
Herscovici, Kovalskys, and Orellana 2017			X (EOT)						X													
Le Grange et al. 1992			X (EOT)	X																		
Le Grange et al. 2016			X (EOT)						X				X									
Lock et al. 2005[a] Lock et al. 2006			X (EOT)						X (EOT)												X	
Lock et al. 2010 Le Grange et al. 2014									X (EOT)				X				X					
Lock et al. 2015			X (EOT)																			
Lock et al. 2018								X (EOT)														

(Continues)

TABLE 2 | (Continued)

	3M	4–6M	6M	7M	6–8M	8M[b]	20 sessions	9M	12M	20 sessions + 3 months	15M	16M	18M	20 sessions + 6 months	20M	21M	24M	20 sessions + 12 months	28M	3.3 years[c]	4 years[d]	5 years
Lock et al. 2021[a]		X (EOT)			X			X (EOT)	X													
Lock et al. 2023	X							X (EOT)			X					X						
Madden et al. 2015							X (EOT)							X				X				
Rhodes et al. 2008							X (EOT)															
Robin et al. 1999									X										X			
Russell et al. 1987									X (EOT)													X
Eisler et al. 1997																						

[a]Lock et al. 2005, 2021 have two "EOT" timepoints because treatment arms were of varying duration.
[b]Actual timepoint in Agras et al. (2014) was 36 weeks.
[c]Timepoint in Le Grange et al. (2014) was a range of 3–5 years, with an average of 3.26 years.
[d]Timepoint in Lock et al. (2006) was a range of 2.3–6.0 years, with an average of 3.96 years.

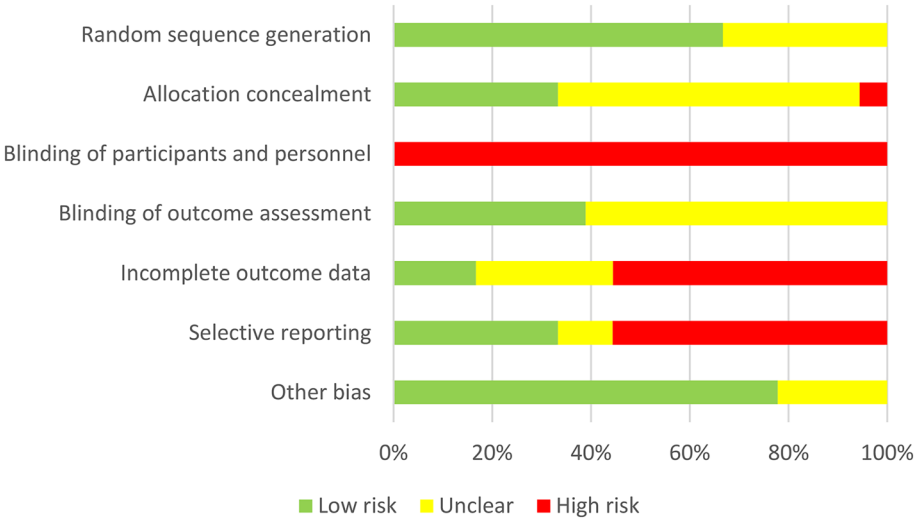

FIGURE 2 | Risk of bias percentage by domain.

et al. 2010, 2023; Madden et al. 2015). One study only reported weight remission (Lock et al. 2005) and another did not explicitly report remission but did report achievement of target weight (Robin et al. 1999). Two studies (11%) did not report remission (Le Grange et al. 1992; Lock et al. 2018).

Data collection timepoints varied considerably between trials. A visual representation of all timepoints across all studies is presented in Table 2.

3.4 | Methodological Characteristics and Quality

Methodological rigor of the included studies was assessed by two reviewers using the Cochrane Collaboration's tool for risk of bias assessment in randomized trials (Higgins et al. 2011). Considerable variability in risk of bias was identified across studies and domains. A summary of this assessment can be found in Figure 2, and in the text that follows, with further details presented in Table S4.

Most studies ($n = 12$, 67%) adequately described the randomization sequence (Aarnio-Peterson et al. 2024; Agras et al. 2014; Eisler et al. 2000, 2016b; Herscovici, Kovalskys, and Orellana 2017; Le Grange et al. 2016; Lock et al. 2010, 2021, 2023; Madden et al. 2015; Rhodes et al. 2008; Robin et al. 1999) while the six remaining studies (33%) had no description for the randomization process or the information provided was unclear (Ball and Mitchell 2004; Le Grange et al. 1992; Lock et al. 2005, 2015, 2018; Russell et al. 1987). Allocation concealment was considered low risk in six studies, or 33% (Eisler et al. 2000; Le Grange et al. 1992, 2016; Lock et al. 2010; Rhodes et al. 2008; Russell et al. 1987), unclear due to insufficient information in 11 studies, or 61% (Aarnio-Peterson et al. 2024; Agras et al. 2014; Ball and Mitchell 2004; Eisler et al. 2016b; Herscovici, Kovalskys, and Orellana 2017; Lock et al. 2005, 2015, 2018, 2021, 2023; Robin et al. 1999), and high risk in Madden et al. (2015). No trials were able to blind patients or therapists to treatment arm, which is typical in RCTs of psychotherapy. Blinding of outcome assessment was maintained in seven trials, or 39% (Aarnio-Peterson et al. 2024; Agras et al. 2014; Eisler et al. 2016b; Herscovici, Kovalskys, and Orellana 2017; Lock et al. 2005, 2023; Madden et al. 2015), and was unclear in the remaining 11 trials, or 61% (Ball and Mitchell 2004; Eisler et al. 2000; Le Grange et al. 1992, 2016; Lock et al. 2010, 2015, 2018, 2021; Rhodes et al. 2008; Robin et al. 1999; Russell et al. 1987).

The two most substantial risks of bias across all studies were (1) incomplete outcome data and (2) selective reporting. Three studies, or 17% (Agras et al. 2014; Eisler et al. 2016b; Lock et al. 2023) were considered low risk for incomplete outcome data based on clear intention-to-treat analyses, 5 studies (28%) were considered to have unclear risk based on insufficient detail about the analysis procedure or unclear descriptions of dropout cases (Herscovici, Kovalskys, and Orellana 2017; Le Grange et al. 2016; Lock et al. 2015, 2021; Madden et al. 2015), and 10 (56%) studies were rated as high risk for missing outcome data based on no intention-to-treat analysis and insufficient consideration for dropout cases (Aarnio-Peterson et al. 2024; Ball and Mitchell 2004; Eisler et al. 2000; Le Grange et al. 1992; Lock et al. 2005, 2010, 2018; Rhodes et al. 2008; Robin et al. 1999; Russell et al. 1987). Selective reporting was low risk in six studies, or 33% (Eisler et al. 2016b; Herscovici, Kovalskys, and Orellana 2017; Lock et al. 2010, 2018, 2021, 2023) and of unclear risk in Aarnio-Peterson et al. (2024) and Agras et al. (2014) based on missing confidence intervals and standard deviations respectively. Selective reporting was rated as high risk in 10 studies (56%) given that measures cited in the methods or protocol were not reported in results (Ball and Mitchell 2004; Eisler et al. 2000; Le Grange et al. 1992, 2016; Lock et al. 2005, 2015; Madden et al. 2015; Rhodes et al. 2008; Robin et al. 1999; Russell et al. 1987). Other potential forms of bias were also assessed, including statistically significant differences on outcome measures at baseline (Herscovici, Kovalskys, and Orellana 2017), an unbalanced design (Lock et al. 2015), and inconsistencies in reporting (Russell et al. 1987).

3.5 | Outcomes

There were an insufficient number of studies to meta-analytically compare FT-ED versus Systemic Family Therapy, FT-ED to Multifamily Therapy (MFT), or to compare within

and across the many FT-ED formats (i.e., meal vs. no meal, multifamily vs. single family, short vs. long, virtual vs. guided self-help, and various adjunctive therapies or parental coaching). As such, the results are described narratively below.

3.5.1 | FT-ED Versus Systemic Family Therapy

One trial compared FT-ED, specifically FBT, with Systemic Family Therapy (Agras et al. 2014). This trial found that there was no significant difference in weight, eating disorder psychopathology, and remission outcomes at the end of treatment or a year later, although FBT was more cost effective (Agras et al. 2014).

3.5.2 | FT-ED Versus MFT

One trial compared FT-ED, specifically FT-AN, with MFT (Eisler et al. 2016b). At the end of treatment, patients in MFT were significantly more likely to have attained an intermediate or good outcome on the MROAS in comparison to those in FT-AN (marginal OR = 2.55, 95% CI [1.17, 5.52], $t = 2.36$, $p = 0.018$). This finding did not maintain statistical significance through short-term follow up, although those in MFT were still more likely to have a good or intermediate outcome (marginal OR = 2.01, 95% CI [0.91, 4.45], $t = 1.72$, $p = 0.086$). Weight as measured as %mBMI was not significantly different between groups at the end of treatment ($M = 2.24$, 95% CI [−0.47, 4.95], $t = 2.36$, $p = 0.105$) although this changed in favor of MFT 6 months later ($M = 4.11$, 95% CI [0.98, 7.24], $t = 2.57$, $p = 0.010$). No significant group differences were found on EDE score.

3.5.3 | Medical Stabilization With FT-ED Versus Weight Restoration With FT-ED

Madden et al. (2015) examined 20 sessions of FBT following hospitalization, with one treatment arm attending inpatient care just long enough to become medically stabilized (MS + FBT), an average of 21.7 inpatient days, while the other treatment arm had a longer stay to achieve weight restoration (WR + FBT), an average 36.9 inpatient days. There were no significant differences in weight, eating disorder psychopathology, or remission rates between the two treatments, though MS + FBT was more cost effective.

3.5.4 | FT-ED With Family Meal Versus FT-ED Without Family Meal

One trial compared FBT delivered with or without a family meal intervention (Herscovici, Kovalskys, and Orellana 2017). No significant differences were found in weight, eating disorder psychopathology, and remission outcomes at the end of 6-month treatment or at short-term follow-up 6 months later.

3.5.5 | FT-ED Shorter Versus FT-ED Longer

One trial compared a shortened, 6-month version of FBT to a lengthier 12-month version (Lock et al. 2005). No significant differences were found in either weight or eating disorder psychopathology at short-term follow-up (12 months after end of treatment) or at long-term follow-up (3–5 years, $M = 3.26$).

3.5.6 | FT-ED Versus Adaptive FT-ED

Two trials compared the classic (conjoint) FBT model to an adaptive FBT model (Lock et al. 2015, 2023) in which the adaptive format included delivery of intensive parental coaching (IPC) if the patient had not gained 2.4 kg by the fourth session. In a pilot trial by Lock et al. (2015), patients were randomized at treatment start (baseline) to either (1) FBT or (2) FBT but with IPC added if there was insufficient weight gain at session four. No significant differences in weight, eating disorder psychopathology, or remission were found between treatment arms at the end of treatment, although the study was not intended or powered to determine a superior treatment. In a fully powered RCT by Lock et al. (2023), patients who did not gain 2.4 kg were randomized at the fourth session of FBT to either (1) continue with FBT, or (2) receive FBT + IPC. Those in FBT had significantly higher rates of remission (defined as BMI >94% plus EDE score within 1 standard deviation of the community norm) at short-term follow ups (6 and 12-months post treatment) compared to those in FBT + IPC. No other significant differences in eating disorder psychopathology or weight were found at the end of treatment and sustained across short-term follow-ups.

3.5.7 | FT-ED + Art Therapy Versus FT-ED + Cognitive Remediation Therapy

One pilot trial compared FBT with adjunct art therapy (FBT-AT) to FBT with adjunct cognitive remediation therapy (FBT-CRT) (Lock et al. 2018). There were no significant differences in weight or eating disorder psychopathology outcomes at the end of treatment, although the stated main purpose of the study was to establish feasibility for a larger RCT.

3.5.8 | FT-ED Video Conference Versus Guided Self-Help FT-ED

One pilot trial compared FBT delivered by video conference (FBT-V) with guided self-help FBT (GSH-FBT) (Lock et al. 2021). No significant differences in weight, eating disorder psychopathology, or remission outcomes were found, although GSH-FBT was considered more efficient, and the main purpose of the trial was to establish feasibility for a larger, adequately powered RCT.

3.5.9 | FT-ED Versus FT-ED + Parent-to-Parent Consultation

One trial compared FBT to FBT with an additional single session of parent-to-parent consultation (Rhodes et al. 2008). No significant differences in weight or remission were found at the end of treatment.

3.5.10 | FT-ED + Support Group Versus FT-ED + Emotion Coaching

One pilot trial (Aarnio-Peterson et al. 2024) compared FBT with a concurrent parental support group (FBT + support), which focused on psychoeducation, to FBT with concurrent emotion coaching (FBT + EC), which focused on expressed emotion and increasing parental warmth. Both treatments were delivered virtually. No significant differences in weight were found at the end of treatment or short-term (3 month) follow-up after adjusting for baseline weight. Rates of full remission were higher for FBT + EC at the end of treatment compared to FBT + support (40% to 27% respectively, OR = 1.80, 95% CI [0.28, 11.12]), although rates became similar at short-term follow-up (43% to 40% respectively, OR = 1.13, 95% CI [0.16, 7.99]).

Overall, there appears to be no significant differences in the outcomes examined when comparing FT-AN versus Systemic Family Therapy, FBT versus adaptive FBT, medical stabilization plus FBT versus weight restoration plus FBT, or short versus long FBT. Based on small sample sizes (e.g., pilot studies), there is not yet sufficient evidence to comment on the effect of FBT with family meal versus FBT without meal, FBT with art therapy versus FBT with CRT, FBT with support group versus FBT with emotion coaching, video conference FBT versus guided self-help FBT, or FBT versus FBT with a single parent-to-parent consultation session. There is some preliminary evidence that MFT may offer superior outcomes compared to FT-AN. Often, RCTs comparing various family approaches do not demonstrate significant difference between treatment arms.

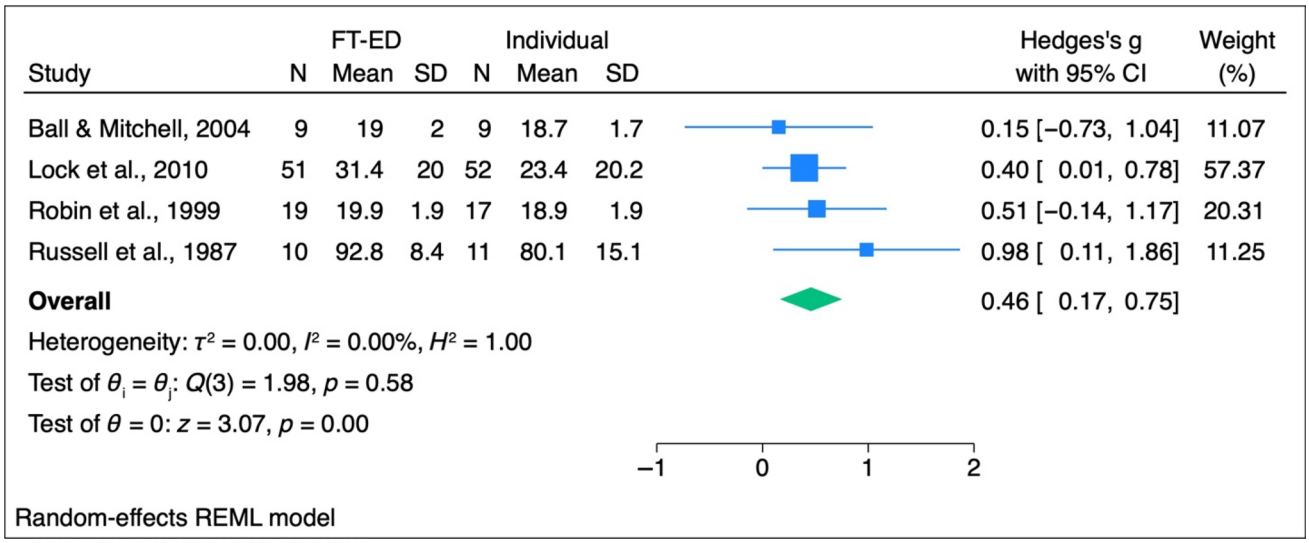

FIGURE 3 | Weight at end of treatment (12–16 months) for FT-ED versus individual therapy. Ball and Mitchell (2004) and Robin et al. (1999) used BMI, Lock et al. (2010) used BMI percentile, and Russell et al. (1987) used %ABW.

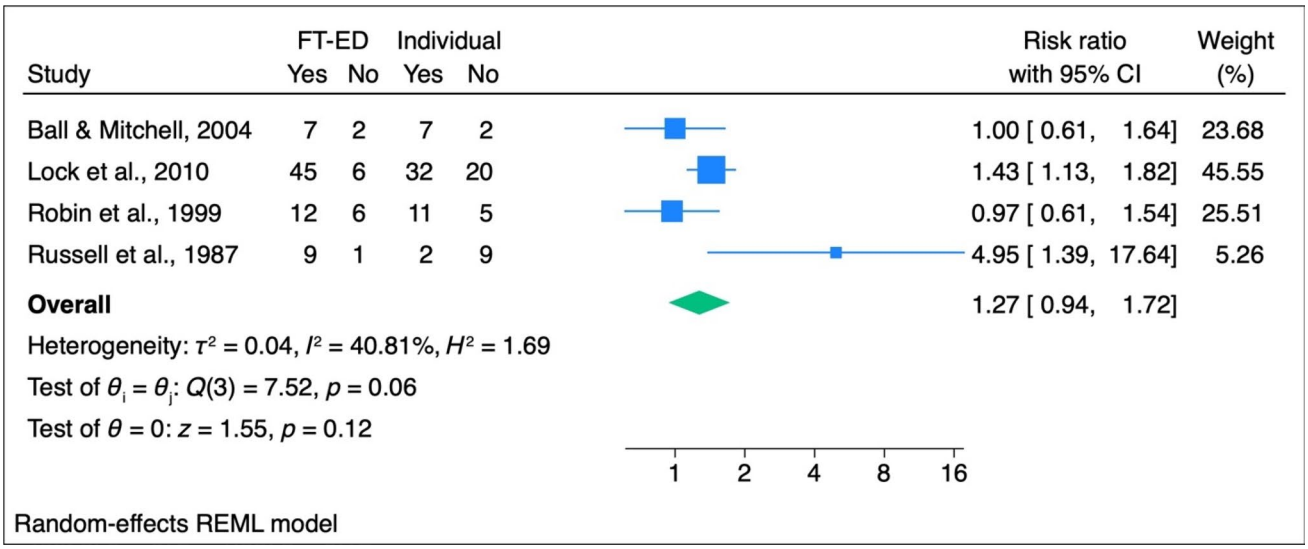

FIGURE 4 | Remission at end of treatment (12–16 months) for FT-ED versus individual therapy. Ball and Mitchell (2004) used adapted MROAS (intermediate/good + 4 kg), Lock et al. (2010) used partial or full remission (>85% IBW), Robin et al. (1999) used achievement of target weight, Russell et al. (1987) used MROAS (intermediate/good).

3.6 | Meta-Analytic Comparison

3.6.1 | FT-ED Versus Individual Therapy

Four trials compared FT-ED with individual therapy (Ball and Mitchell 2004; Lock et al. 2010; Robin et al. 1999; Russell et al. 1987). Heterogeneity was significant only for the meta-analysis of eating disorder psychopathology. Three trials used adolescent focused therapy (AFT) or its predecessor ego-oriented individual therapy (EOIT) as the comparison treatment (Lock et al. 2010; Robin et al. 1999; Russell et al. 1987), while one trial used cognitive behavioral therapy (CBT) as the comparator (Ball and Mitchell 2004).

All trials had data at end of treatment, two provided additional short-term follow-up data (Ball and Mitchell 2004; Lock et al. 2010) and three had long-term follow-up data (Eisler et al. 1997; Lock et al. 2010; Robin et al. 1999). At end of treatment, FT-ED was favored with statistical significance over individual therapy for weight outcomes (see Figure 3, $g = 0.46$, 95% CI [0.17, 0.75]) and favored with non-statistical significance on study defined remission (see Figure 4, RR = 1.27, 95% CI [0.94, 1.72]) and eating disorder psychopathology (see Figure 5, $g = 0.55$, 95% CI [−0.29, 1.39]). This superiority and the associated effect sizes were somewhat reduced over time (see Figures S1–S6), with long-term follow-up demonstrating a non-significant favoring of FT-ED for weight outcomes ($g = 0.24$, 95% CI [−0.08, 0.56]) and remission (RR = 1.41, 95% CI [0.94, 2.11]), and no superiority in eating disorder psychopathology ($g = 0.04$, 95% CI [−0.34, 0.42]).

3.6.2 | FT-ED Versus Separated or Parent-Focused FT-ED (PFT)

Three trials compared the delivery of FT-ED with parents/caregivers and the adolescent together in comparison to a separated or parent-focused approach (Eisler et al. 2000; Le Grange

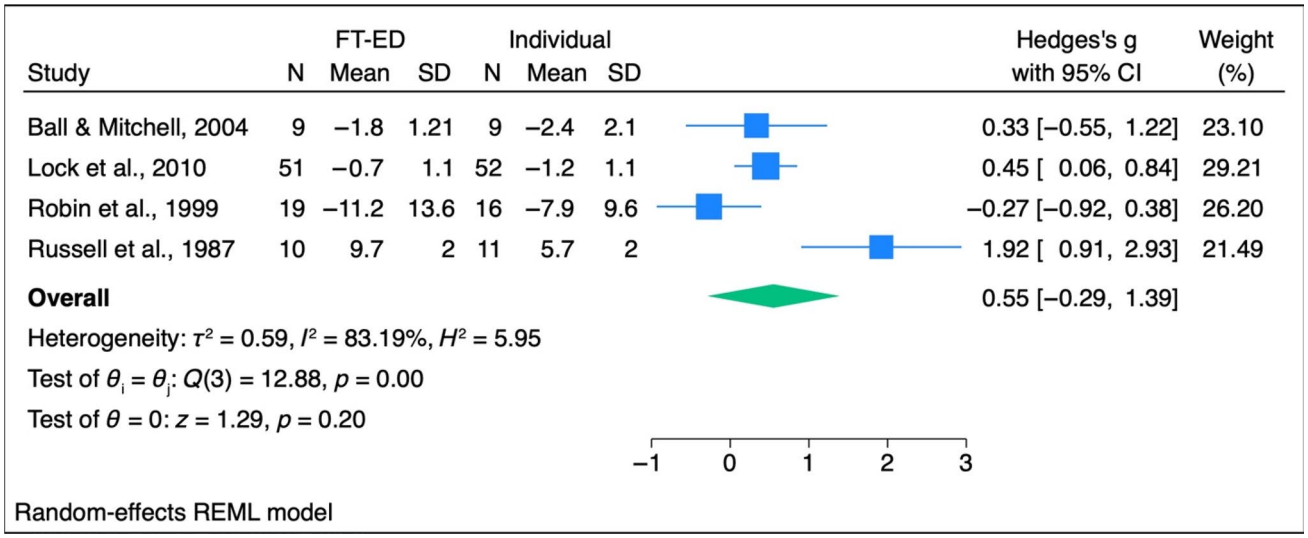

FIGURE 5 | Eating pathology at end of treatment (12–16 months) for FT-ED versus individual therapy. Ball and Mitchell (2004) an Lock et al. (2010) used EDE, Robin et al. (1999) used EAT, Russell et al. (1987) used MROAS nutrition subscale.

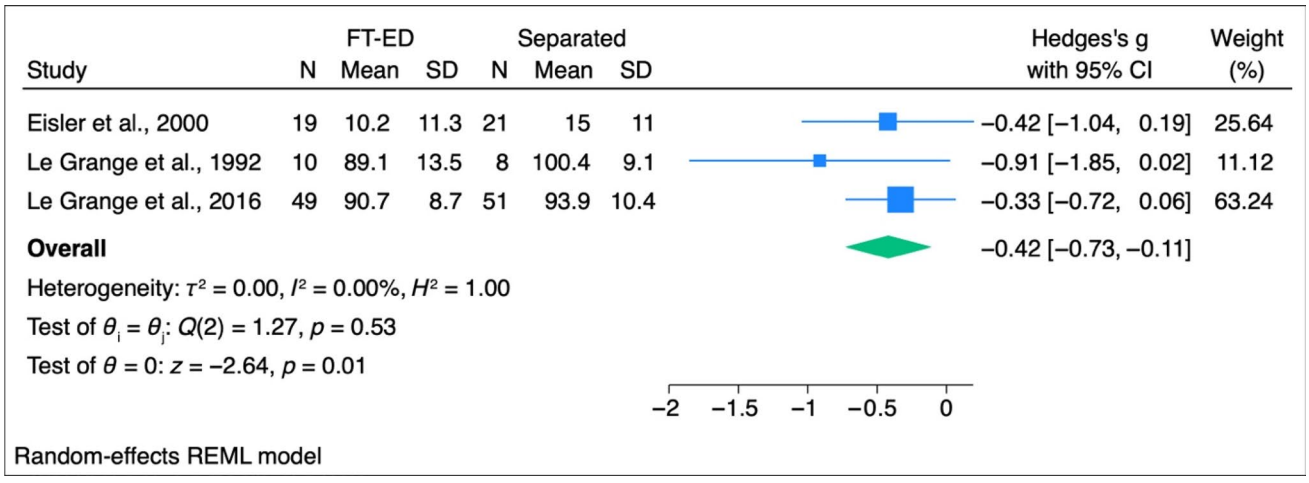

FIGURE 6 | Weight at end of treatment (6–12 months) for conjoint FT-ED versus separated. Eisler et al. (2000) used change in %ABW, Le Grange et al. (1992) used %ABW, Le Grange et al. (2016) used %mBMI.

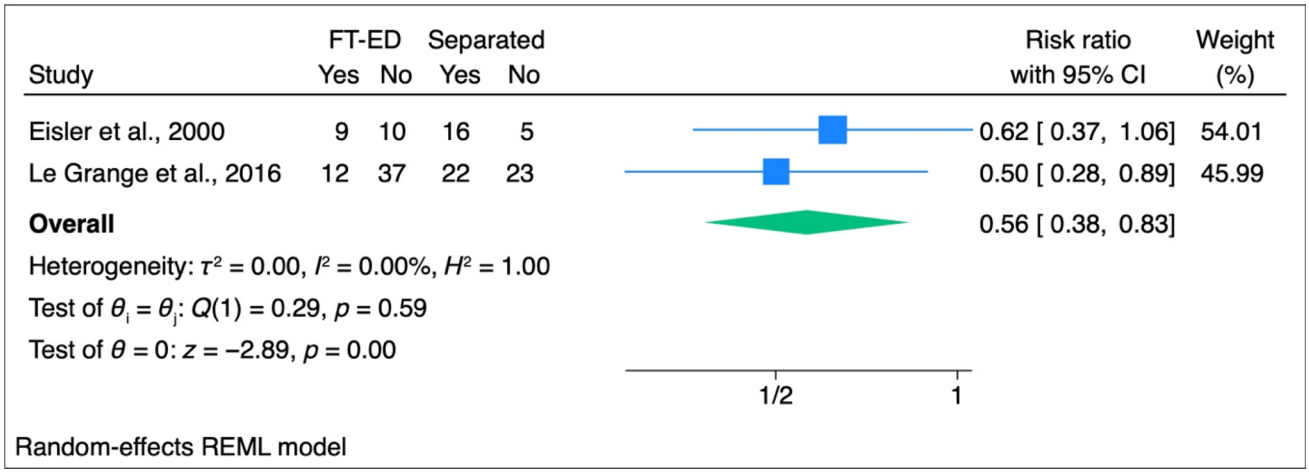

FIGURE 7 | Remission at end of treatment (6–12 months) for conjoint FT-ED versus separated. Eisler et al. (2000) used MROAS (intermediate/good), Le Grange et al. (2016) used ≥95% mBMI and EDE within 1 SD of community.

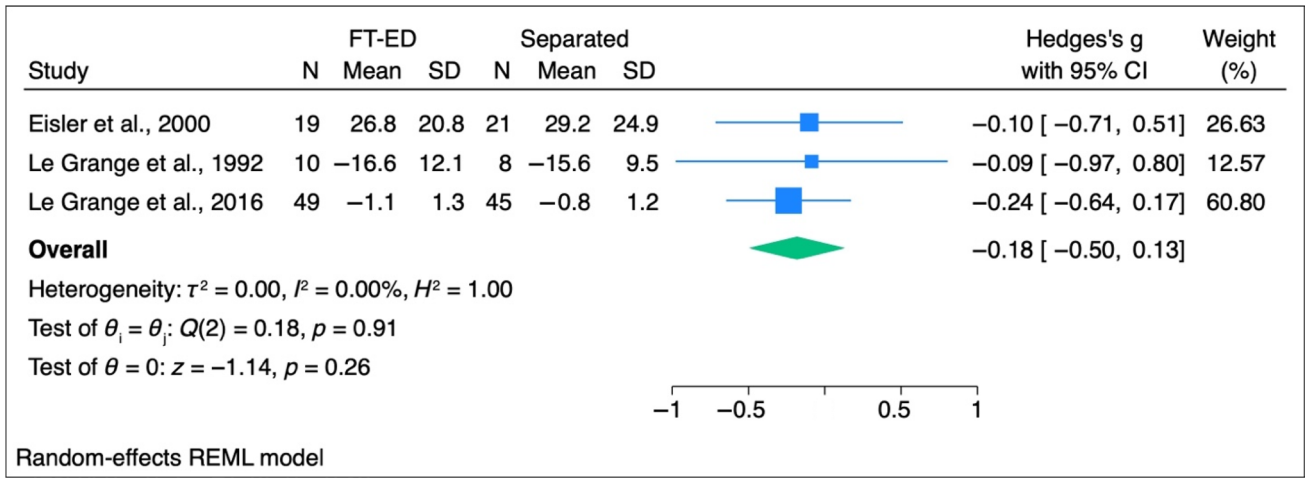

FIGURE 8 | ED psychopathology at end of treatment (6–12 months) for conjoint FT-ED versus separated. Eisler et al. (2000) used change in EAT, Le Grange et al. (1992) used EAT, Le Grange et al. (2016) used EDE.

et al. 1992, 2016). Heterogeneity was negligible in all of the meta-analyses comparing separated to parent-focused approaches. All trials had data at end of treatment, although Le Grange et al. (1992) did not include a remission outcome. One trial had short-term follow-up data from 6 and 12-months after end of treatment (Le Grange et al. 2016), whereas one had long-term data from a 5-year follow-up (Eisler et al. 2007). As such, only an end of treatment comparison was included in analyses.

At end of treatment, separated FT-ED was favored with statistical significance over conjoint FT-ED for weight outcomes (see Figure 6, $g = -0.42$, 95% CI [−0.73, −0.11]) and study defined remission (see Figure 7, RR = 0.56, 95% CI [0.38, 0.83]). There was no statistically significant difference in eating disorder psychopathology (see Figure 8, $g = -0.18$, 95% CI [−0.50, 0.13]). Short-term follow up data from Le Grange et al. (2016) demonstrated that there were no statistically significant differences between FT-ED, specifically FBT, and PFT on weight, eating disorder psychopathology, or remission rates. At long term (5-year) follow-up for the Eisler et al. (2000) trial, patients who received separated FT-AN had a slightly higher weight than those in regular FT-AN, but this was not statistically significant (Eisler et al. 2007). There were also no statistically significant differences in rates of remission (Eisler et al. 2007). A summary of findings from all meta-analysis results and assessment with GRADE can be found in Tables S5 and S6.

4 | Discussion

This review explored the efficacy of FT-ED in adolescents with AN in comparison to other forms of psychotherapy, such as individual approaches or systemic approaches. A secondary aim was to assess the relative efficacy of different variations of FT-ED (e.g., shorter vs. longer dose, parent-focused). Given that FT-ED is the recommended first line of treatment for most adolescents with AN, the evidence for this approach must be current to guide clinical practice.

The first key finding of this meta-analysis is that FT-ED appears to offer significantly superior weight outcomes when compared to individual therapy at end of treatment. This superiority of FT-ED declines over short- and long-term follow-up, with FT-ED still favored over individual therapy, but losing statistical significance.

While the reason for this loss of statistical significance over time is not known, one might speculate that FT-ED works more efficiently in facilitating weight gain but that individual therapy "catches up." Another possibility is that the impact of therapy in general declines over time after the end of treatment, and other currently unmeasured variables become more influential, for example, positive or negative life events.

The results of this first analysis can be compared against the previous review by Couturier, Kimber, and Szatmari (2013). This previous systematic review and meta-analysis found that there were no differences between FT-ED and individual therapy at end of treatment, but that FT-ED was significantly superior at follow-up. There are a few key methodological differences between these meta-analyses. Firstly, our analysis measured follow-up timepoints from the start of treatment whereas Couturier et al. measured follow-up from the end of treatment. Further, we included two follow-up timepoint analyses to compare data at the most similar points. This translated to a "short-term" follow up at 18 months post treatment start (corresponding to 6 months since the end of treatment), and a "long term" follow-up, 2–5 years post treatment start. In comparison, Couturier et al. compared all studies at a single follow-up timepoint at 6–12 months after the end of treatment. Finally, Couturier et al.'s review examined one outcome: remission as definition within each original trial. Our review examined this outcome in addition to a weight outcome and an eating disorder psychopathology outcome. These differences in methodology likely explain the disparate findings between reviews.

A second key finding is that separated or parent focused FT-ED (i.e., any non-conjoint approach), offered significantly superior weight outcomes to conjoint FT-ED at end of treatment. Two of the three included trials (Le Grange et al. 2016; Eisler et al. 2000) performed secondary data analysis to examine the role of parental expressed emotion on outcomes. Both analyses suggested that a separated or parent focused approach is preferable for families experiencing high expressed emotion at baseline (Allan et al. 2018; Eisler et al. 2007). The finding of non-inferiority for a separated or parent-focused approach could be used to increase the confidence of clinicians to implement a separated or parent only approach when clinically indicated without fearing that they are deviating from an evidence-based treatment. A limitation of this finding is the relatively small number of studies ($N = 3$) and the lack of follow-up comparisons across time.

An overarching finding of our review is that the comparison of FT-ED trials within and across comparator treatments is limited given the heterogeneity of outcomes reported, including measures and timepoints. For example, weight was reported in a diverse number of ways. Furthermore, trials often report results based on how the research team defines end of treatment (e.g., 20 sessions vs. 6 months vs. 1 year), measuring follow-up timepoints from this date. This approach is problematic given that length of treatment in this review ranged from 6 to 16 months. While some variation in outcomes was accounted for in this meta-analysis (e.g., using Hedge's *g* standardized mean difference to created pooled effect sizes across different measures), it is difficult to compare studies further. Despite the lack of outcome consistency, it is still common practice to compare outcomes from previous RCTs with different outcomes measures, doses of treatment, and timepoints (e.g., Lock et al. 2010). More specifically, disparate definitions of remission across RCTs of FT-ED may produce false inferences when comparing outcomes. Work by Le Grange et al. (2019) shows that remission rates in a single dataset can range from 22% to 88% depending on the criteria applied. The eating disorders field has begun the work of identifying minimum standards for outcome reporting in routine clinical care (Austin et al. 2023). It could be beneficial for international research groups who specialize in clinical trials for anorexia nervosa in children and adolescents to determine standard expectations for outcome reporting. This resource could be especially helpful as we begin to examine different family approaches delivered across a variety of setting and intensities, including intensive day programs (e.g., Simic et al. 2018), multiple family formats (Baudinet et al. 2021), adjunctive approaches (Timko et al. 2021), and home-based treatment (e.g., Besse-Flütsch et al. 2023; Goldschmidt et al. 2022).

Another overarching finding is the lack of consensus on the clinical question of interest. More specifically, there are a variety of comparisons that are examined in only a single trial, making meta-analysis impossible and limiting the strength of the conclusions. Most often, one or two trials will examine a form of FT-ED with a modification or adjunct component (Pedersen, Carlsson, and Bentz 2024). It could be that having a greater number of studies on a smaller range of questions would ultimately provide more useful information. A consensus building approach, for example the James Lind Alliance Approach as used in EDs by Aouad et al. (2023), Obeid et al. (2020), and van Furth, van der Meer, and Cowan (2016), could be an avenue forward to identify key research questions of interest.

This review focused on childhood and adolescence, the most typical time of onset for AN. However, the onset of eating disorders straddles the transition from childhood to adulthood, with young people over the local adolescent age of majority also needing treatment. The concept of emerging adulthood has been proposed as a way to understand the complex interplay of independence and reliance on family between the ages of approximately 18 and 25 (Tanner and Arnett 2016). Potterton et al. (2020) suggest that emerging adults have distinct needs and challenges that should be considered within eating disorder treatment. Various modalities of FT-ED have previously been adapted for emerging adults (Dodge et al. forthcoming). For example, Dimitropoulos et al. (2018) adapted manualized FBT to meet the unique needs and challenges of transition age youth. Most recently, an RCT by Nyman-Carlsson et al. (2020) in Sweden examined the outcomes of 78 emerging adults aged 17–24 randomized to 60 h of either individual cognitive behavioral therapy for young adults (CBT-YA) or family/individual therapy for young adults (FT-YA). FT-YA was an adapted version of FBT (Lock and Le Grange 2015) but with more individual sessions for the young person and no family meals. Both groups had similar rates of weight gain and remission at end of treatment and follow-up at 18-months (Nyman-Carlsson et al. 2020). This trial, including outcomes and the resources/length of treatment in comparison to other health systems, should be considered in addition to this review when considering the evidence for older adolescents. The field may benefit from a review of the evidence in family and individual approaches for emerging adults, including observational studies. There is also an increased recognition of ED onset across the lifespan (e.g., Mangweth-Matzek, Kummer, and Hoek 2023)

which highlights the unchartered territory of family support in EDs across the lifespan (Baudinet and Eisler 2024).

This review/meta-analysis has some key limitations. Firstly, the number of studies in the meta-analysis is quite low: four studies in the comparison of FT-ED versus individual therapies and three studies in the comparison of conjoint FT-ED versus a separated or parent focused approach. We proceeded with meta-analysis despite relatively low numbers based on advice by Cochrane Review Group (2016) that two or more studies can be combined for meta-analysis so long as studies can be meaningfully pooled and there is sufficient similarity across studies. Heterogeneity, measured using I^2, was negligible across most of our comparisons, suggesting sufficient similarity across results. However, the limited number of trials should still be considered alongside the results of the meta-analysis. A second limitation of this study is the generalizability and representativeness of our results based on the lack of diversity within the trial samples. More specifically the evidence is largely from white girls and women. Further, all but one study reported sex or gender using a binary approach, which demonstrates the lack of evidence for ED treatment for gender diverse youth. To strengthen the evidence base for all adolescents, future trials should consider careful reporting of demographic characteristics, allowing future systematic reviews to employ a meta-regression approach. A complementary issue is the lack of representativeness within the trials themselves. More specifically, RCTs tend to be in specialist, research orientated hospitals and restrict inclusion to a subset of patients without certain characteristics. One avenue forward would be to supplement RCT driven evidence-based practice with practice-based evidence drawn from routinely collected clinical data.

Overall, this meta-analysis examined the efficacy of FT-ED in children and adolescents with AN. There were sufficient studies to only conduct meta-analyses on the comparison of FT-ED versus individual therapy and FT-ED versus a separated/parent-focused format of FBT. These results demonstrated that FT-ED is significantly superior to individual therapy on weight outcomes at the end of treatment, but not at short-term (12–16 months post treatment start) or long term (2–5 years) follow-up. When comparing FT-ED with separated/parent-focused approaches, it appears that the latter may deliver significantly superior weight at end of treatment, but there was insufficient data to perform a follow-up comparison over time (and examination of individual studies suggest that these differences are not significant at follow-up). Overall, the comparison of studies in FT-ED are hampered by inconsistent outcome measurement, and future research should aim to harmonize measures and timepoints between clinical trials.

Author Contributions

A. Austin: writing – original draft, writing – review and editing. **A. G. Anderson:** project administration, writing – original draft. **J. Lee:** formal analysis, validation. **H. Vander Steen:** project administration, validation, writing – original draft. **C. Savard:** validation. **C. Bergmann:** validation. **M. Singh:** project administration, writing – review and editing. **D. Devoe:** conceptualization, writing – review and editing. **S. Gorrell:** conceptualization, supervision. **S. Patten:** conceptualization, formal analysis, supervision, writing – review and editing. **D. Le Grange:** conceptualization, supervision, writing – review and editing. **G. Dimitropoulos:** conceptualization, supervision, writing – review and editing.

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Conflicts of Interest

D. Le Grange receives Royalties from Guilford Press and Routledge and is co-director of the Training Institute for Child and Adolescent Eating Disorders, LLC. G. Dimitropoulos is a consultant for the Training Institute for Child and Adolescent Eating Disorders, LLC. The remaining authors declare that they have no competing interests.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.