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Family functioning in two treatments for adolescent anorexia nervosa

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Abstract

Objective—Family functioning impairment is widely reported in the eating disorders literature, yet few studies have examined the role of family functioning in treatment for adolescent anorexia nervosa (AN). This study examined family functioning in two treatments for adolescent AN from multiple family members' perspectives.

Method—Participants were 121 adolescents with AN ages 12–18 from a randomized-controlled trial comparing family-based treatment (FBT) to individual adolescent-focused therapy (AFT). Multiple clinical characteristics were assessed at baseline. Family functioning from the perspective of the adolescent and both parents was assessed at baseline and after one year of treatment. Full remission from AN was defined as achieving both weight restoration and normalized eating disorder psychopathology.

Results—In general, families dealing with AN reported some baseline impairment in family functioning, but average ratings were only slightly elevated compared to published impaired functioning cutoffs. Adolescents' perspectives on family functioning were the most impaired and were generally associated with poorer psychosocial functioning and greater clinical severity. Regardless of initial level of family functioning, improvements in several family functioning domains were uniquely related to full remission at the end of treatment in both FBT and AFT. However, FBT had a more positive impact on several specific aspects of family functioning compared to AFT.

Discussion—Families seeking treatment for adolescent AN report some difficulties in family functioning, with adolescents reporting the greatest impairment. While FBT may be effective in improving some specific aspects of family dynamics, remission from AN was associated with improved family dynamics, regardless of treatment type.

Keywords

Anorexia nervosa; adolescents; family functioning; family-based treatment; adolescent-focused therapy

Family functioning is an important but often neglected outcome in the treatment of eating disorders, given consistent reports from patients and their family members of impairment in one or more areas of family functioning compared to community norms^{1–3} and to non-psychiatric controls.^{4–10} Common areas of family functioning impairment include family cohesion and organization, family conflict, and emotional expression. Of note, historical perspectives on eating disorders viewed family dysfunction as directly related to the development of eating psychopathology.¹¹ However, this theory is not empirically supported since no research has identified family structure or dysfunction patterns typical within eating disorder populations.^{12,13} Moreover, individuals and family members within other psychiatric populations, including obsessive-compulsive disorder,¹⁴ other anxiety disorders,¹⁵ and substance dependence,¹ experience similar levels of family functioning impairment. Thus, family dysfunction is not unique to eating disorders, and it likely results from coping with chronic psychiatric illness.

In spite of ample research on family functioning impairment in eating disorder populations, relatively little is known about how family functioning is related to eating disorder symptoms and other markers of clinical severity. Some research suggests that the severity of family functioning impairment is equivalent across eating disorder diagnostic categories^{2, 6, 7, 9, 14} and unrelated to the severity of eating disorder symptoms.¹⁶ However, other research suggests that greater family functioning impairment is found with more severe eating disorder psychopathology,^{6, 10, 17} the presence of binge-purge symptoms,^{2, 18–20} and concurrent depressive symptoms.^{20, 21} Perhaps unsurprisingly, family members differ significantly in their report of impairment in family functioning.²² Particularly for children and adolescents, patient and parent reports are often disparate.^{2, 4, 21} However, it is unclear whose report is most clinically relevant.

Further, little is known about the impact of eating disorder treatment on family functioning (or conversely the impact of family functioning on treatment). This has significant implications for the treatment of adolescent anorexia nervosa (AN), in which family members are typically essential. Family-based treatment (FBT; also known as Maudsley family therapy) is the current first-line treatment for adolescent AN. FBT has the inherent capability to address family impairment within its treatment framework. In fact, FBT was developed with the understanding that while families do not cause eating disorders, they may restructure in dysfunctional ways over time in response to AN and this may serve to maintain the disorder. Therefore, FBT mobilizes parents to take charge of the illness and seeks to facilitate adaptive restructuring that may assist eating disorder recovery.²³ Some research has supported the idea that family functioning may play a role in treatment. Indeed, several early studies of FBT found that high levels of baseline parental criticism (an aspect of expressed emotion that is related to overall family functioning) were related to early treatment dropout and poorer treatment outcome.^{24–27} Yet, other studies have failed to find

an association between critical comments and FBT treatment response.^{28,29} Thus, it is unclear whether family dynamics moderate treatment outcome.

Furthermore, very few studies have examined change in family functioning during treatment for adolescent AN. Moreover, studies do not typically examine the direct relationship between change in family functioning and treatment outcome. Some research supports improvement in family dynamics during treatment. For example, one study found that families had greater expressiveness, greater competency, clearer family roles, and more appropriate cohesion and adaptability following family therapy based on structural and Maudsley therapy models.³⁰ Another study found improvement in parent-reported family cohesion, expressiveness, and control during FBT, and that improvements in parent-reported family relationships and family control were associated with an increased likelihood of remission from AN at the end of treatment.³¹ A third study found improvements in communication and reductions in conflict over eating that occurred in both individual treatment and a family therapy similar to FBT. This same study found that both patient- and parent-reported reductions in family conflict over eating were associated with improved outcome in both treatments.³² Yet, other research reported no change or deterioration in family functioning after treatment,^{16,33} although the specific type of family therapy utilized in these studies is unclear, limiting our conclusions. Given the small number of studies and their mixed results, our current understanding of how treatment impacts family functioning is limited. Research suggests that positive changes in family dynamics may be associated with recovery, although this may simply reflect improvement in eating disorder symptoms.

With this relative lack of knowledge about the role of family functioning in the treatment of eating disorders in mind, the current study sought to examine family functioning in the treatment of adolescent AN from the perspective of multiple family members. First, we examined the relation between family functioning (patient and parent reports) and baseline clinical characteristics among adolescents seeking treatment for AN. Second, we evaluated changes in family functioning during the course of two treatments: FBT and individually-based adolescent-focused therapy (AFT). Finally, we explored whether changes in family functioning during treatment were associated with treatment outcome.

Method

Participants

Participants in this study included 121 adolescents ages 12–18 participating in a two-site (The University of Chicago and Stanford University) randomized controlled trial comparing FBT to AFT. Adolescents met DSM-IV criteria for AN, excluding the amenorrhea criterion.^{34,35} The main outcome findings from this trial have been published elsewhere,²³ where FBT was superior to AFT in the number of adolescents achieving full remission (i.e., achieving 95% of expected body weight (EBW) plus scores within 1 standard deviation (*SD*) of established norms on the Eating Disorder Examination Global scale³⁶) at 6- and 12-month follow-up. Both treatments were provided on an outpatient basis over a one-year period and involved three distinct phases.

FBT consisted of 24 one-hour sessions that included the whole family and focused on increasing parental control of eating disorder symptoms. Phase 1 of treatment consisted of instructing parents to take temporary full ownership of all food- and weight-related decisions to promote rapid weight gain. Phase 2 of FBT focused on transitioning control over these decisions back to the adolescent. Phase 3 briefly focused on developmental issues related to the eating disorder and returning the family back to normal roles.

AFT consisted of 32 45-minute individual sessions with the adolescent plus up to eight collateral parent-only sessions. AFT placed responsibility for change in the hands of the adolescent, promoting adolescent individuation by increasing ego strength and coping skills. AFT, originally named Ego-Oriented Individual Therapy,^{32,37} also contained three treatment phases. Phase 1 consisted of discouraging dieting, encouraging weight gain (including setting clear weight gain goals), and identifying emotional versus biological needs. Phase 2 consisted of promoting individuation and practicing skills to tolerate negative emotions, and Phase 3 was focused on therapy termination. A more detailed description of both manualized treatments can be found in the original outcome report.²³ All research procedures were approved by the Institutional Review Boards at each treatment site, and all participants consented to their involvement in the research.

Assessments

Treatment outcome (i.e., full remission) was defined consistent with the main outcome report as achieving 95% of EBW plus scores within 1 *SD* of established norms on the EDE Global scale.²³ EBW was calculated as the percentage of expected weight for height, age, and gender using Center for Disease Control and Prevention growth charts at the 50th body mass index percentile.

Baseline clinical characteristics included the following: (1) length of illness (in months), (2) % EBW, (3) any prior inpatient psychiatric hospitalizations for AN (yes or no) (4) comorbid psychiatric diagnosis (yes or no), (5) taking psychotropic medication at study entry (yes or no), (6) AN subtype [AN binge-purge (AN-BP) or restricting subtype (AN-R)], and (7) family status (intact, i.e., parents married and/or living together or non-intact, i.e., parents divorced, not living together, or single parent family), (8) eating disorder psychopathology, assessed with the Eating Disorder Examination (EDE) Global scale,³⁶ (9) depressive symptoms, assessed with the Beck Depression Inventory (BDI),³⁸ (10) self-esteem, assessed with the Rosenberg Self-Esteem Scale (RSES),³⁹ (11) obsessive-compulsive aspects of eating disorder symptoms, assessed with the Yale-Brown-Cornell Eating Disorder Scale (YBC-EDS),⁴⁰ (12) self-efficacy, assessed with the General Self-Efficacy Scale (GSES),⁴¹ and (13) functional impairment, assessed with the Work and Social Adjustment Scale (WSAS).⁴²

The main variable of interest, family functioning, was assessed at baseline and end of treatment (EOT) from father, mother, and adolescent perspectives using the McMaster Family Assessment Device (FAD).⁴³ The FAD was obtained from both parents when available, although mothers completed the surveys at a slightly higher rate than fathers. This is primarily due to the fact that mothers participated in treatment at a higher rate, particularly within non-intact families. The FAD has been well-validated in eating disorder samples and

is commonly used to assess family functioning in this population.⁹ The FAD is a 60-item self-report measure assessing aspects of family structure, organization, and interaction. The FAD is scored on a 1 (strongly agree) to 4 (strongly disagree) Likert rating scale, where higher scores equal greater impairment in functioning. The measure yields six specific subscales: *Problem Solving* (quality and directness of problem solving strategies), *Communication* (clarity and directness of verbal information exchanged), *Roles* (clarity and appropriateness of role distinctions), *Affective Responsiveness* (openness and appropriateness of emotional information), *Affective Involvement* (clarity and appropriateness of emotional involvement with other family members), and *Behavior Control* (clarity and appropriateness of rules). The FAD also includes a distinct *General Functioning* subscale that includes items relating to all other subscales and assesses the overall health/impairment within the family. Cutoffs for impaired functioning have been established to differentiate between family functioning that is healthy versus pathological.⁴⁴ These cutoffs have been shown to have adequate discriminant validity and are able to differentiate between psychiatric and non-psychiatric samples, although the authors note that a proportion of non-clinical families report scores in the pathological range (19–36%) and some clinical families report scores in the healthy range (32–54%).⁴⁴ Non-clinical norms⁴³ have also been established. Impaired functioning cutoffs and non-clinical norms are reported in Table 1. The FAD demonstrates high internal consistency in adolescents with eating disorders and family members.² Internal consistencies for all subscales scores by all reporters (i.e., father, mother, adolescent) in the current sample were acceptable (alpha coefficients ranging from .63 for father-reported *Roles* to .90 for adolescent-reported *General Functioning*).

Statistical Analyses

Data were analyzed using the Statistical Package for the Social Sciences (SPSS), Version 21. Relationships between informants (father versus mother versus adolescent) on reported FAD subscales at baseline were examined with Pearson product-moment correlations. Inter-informant correlations on FAD subscales were low (ranging from .12 to .38) and only 17 of 21 correlations were significant. These low correlations indicate that different family members offer unique information about family functioning. Thus, family members' reports of family functioning were used as three separate dependent variables or included together as three separate independent variables in the analyses. All analyses were conducted using available data for each variable and informant. Analyses across time utilized data available at both time points. Of note, approximately 80% of the sample completed the FAD at both time points (baseline: father $N = 109$ (90.1%), mother $N = 119$ (98.3%), adolescent $N = 120$ (99.2%); EOT: father $N = 89$ (73.6%), mother $N = 96$ (79.3%), adolescent $N = 100$ (82.6%)).

For Aim 1, family member reports of family functioning scales were first visually compared to published cutoff scores for impaired functioning. Second, a series of paired-sample *t*-tests were used to compare family member means on FAD subscales at baseline. Third, a series of stepwise regression analyses were utilized to examine the relative contributions of each family member's ratings of the *General Functioning* subscale at baseline to the variance in baseline clinical characteristics. Linear regression analyses were used for continuous variables and logistic regression analyses were used for binary categorical variables. All

available father, mother, and adolescent *General Functioning* subscale scores were included simultaneously as predictors of each clinical characteristic.

For Aim 2, change in family functioning during treatment was evaluated with a series of repeated measures mixed design analyses of variance (ANOVAs). Separate models were evaluated for each of the seven FAD subscales, with within-subjects variables of time (baseline, EOT) and informant (father, mother, adolescent) and a between-subjects variable of treatment (FBT, AFT).

For Aim 3, the relationship between change in family functioning and full remission was evaluated using stepwise logistic regression analyses. In order to evaluate change in family functioning from baseline to EOT and its association to remission at EOT, the change in FAD subscales was used as an independent variable and baseline score on the FAD subscale was included as a covariate in statistical models. Change scores were calculated by subtracting available FAD scores at EOT from baseline levels so that positive scores equaled greater improvement in family functioning during treatment. Separate models were evaluated for each of the seven FAD subscales controlling for baseline levels of the FAD subscale, with independent variables of treatment condition (FBT or AFT), FAD change score for all informants (father, mother, adolescent), and treatment x FAD subscale interactions for all informants. Following the guidelines of Kraemer and Blasey,⁴⁵ treatment was coded as 0.5 and -0.5 and continuous change scores were centered at their mean. All significant independent variables from separate models (at $p < .05$) were evaluated in a single model using a backward stepwise exclusion procedure controlling for treatment condition. Given that previous research examining family functioning within eating disorders treatment is quite limited, we had no specific predictions about which subscales of the FAD might be more likely to relate to recovery. Given the exploratory nature of Aims 2 and 3, the relationships between treatment, remission, and all seven FAD subscales were evaluated.

Results

Participant Characteristics

Participants in the sample were a mean (*SD*) age of 14.4 (1.6) years old with a mean (*SD*) duration of illness of 11.3 (8.6) months and a mean (*SD*) % EBW of 80.44 (3.59). Around half of participants (45%) had been hospitalized for an eating disorder in the past. A minority of participants were classified as AN-BP (17%), had a comorbid psychiatric disorder (26%), or were taking psychotropic medication upon starting treatment (17%). The majority of participants were from intact families (79%). Detailed participant characteristics have been previously reported.²³

Relationships between general family functioning and baseline clinical and psychosocial variables

Impairment in family functioning—Sample means and individual scores were compared to published cutoff scores⁴⁴ to assess for impairment in family functioning at the beginning of treatment. Table 1 reports this information. For the general functioning

subscale, average scores for all family members were at or slightly above the cutoff. Approximately 40% of mothers and nearly half of fathers and adolescents reported impairment above the cutoff. Of the six remaining subscales, average scores were slightly greater than cutoffs on three adolescent-reported scales (*Communication*, *Affective Involvement*, and *Roles*) and one parent-reported scale each (*Affective Involvement* for fathers and *Roles* for mothers). Depending on the family member, one-half to two-thirds reported impairment in *Communication* and *Affective Involvement*, one-third to one-half reported impairment in *Roles*, and about half reported impairment in *Behavior Control*. Average scores for all family members were lower than cutoffs for *Problem Solving* and *Affective Responsiveness*, with about a third of the sample reporting impairment on these scales.

Differences in family member reports—Paired sample *t*-tests revealed several significant differences between family members in baseline FAD scores. Overall, adolescents reported greater scores than parents for *Communication* ($ps < .006$) but lower scores for *Roles* ($ps < .01$). No differences were found between parents' reports of these subscales ($ps > .20$). Further, adolescents reported greater scores than mothers for *Affective Involvement* ($p = .02$) and *Behavior Control* ($p = .01$), with no differences between other family members on these subscales ($ps > .15$). Both fathers and adolescents reported greater *Affective Responsiveness* scores compared to mothers ($ps < .01$), with no differences between father and adolescent scores ($p > .72$). Finally, no differences were found between family members in *General Functioning* or *Problem Solving* ($ps > .23$).

General family functioning and baseline clinical characteristics—In general, adolescent-reported family functioning (but not father- or mother- reported family functioning) accounted for significant unique variance in several baseline characteristics. Specifically, adolescent-reported *General Functioning* accounted for significant unique variance in depressive symptoms [$\beta = 6.72, p < .001$; overall model: $F(1, 106) = 16.71, p < .001, R^2 = .14$], self-efficacy [$\beta = -3.00, p = .002$; overall model: $F(1, 106) = 10.21, p = .002, R^2 = .09$], functional impairment [$\beta = 6.17, p < .001$; overall model: $F(1, 106) = 15.07, p < .001, R^2 = .13$], eating disorder psychopathology [$\beta = 0.58, p = .02$; overall model: $F(1, 106) = 5.32, p = .02, R^2 = .05$], and eating-related obsessive-compulsive symptoms [$\beta = 4.43, p = .006$; overall model: $F(1, 106) = 7.79, p = .006, R^2 = .07$]. Greater adolescent-reported *General Functioning* scores were also uniquely associated with greater odds of having AN-BP at baseline, $OR = 4.42, p = .002$, overall model: $X^2(1, N = 107) = 9.41, p = .02$. *General Functioning* as reported by both the adolescent ($\beta = 4.89, p < .001$) and mother ($\beta = 3.35, p = .03$) was associated with significant unique variance in self-esteem (overall model: $F(2, 106) = 14.50, p < .001, R^2 = .22$), and the only contribution of father-reported *General Functioning* was to a longer duration of illness ($\beta = 5.89, p = .008$; overall model: $F(1, 105) = 7.31, p = .008, R^2 = .07$). *General Functioning* was not a significant predictor of baseline % EBW, prior psychiatric hospitalization, family status, medication status, or psychiatric comorbidity.

Change in family functioning during treatment

No main effects for time were identified for any of the seven FAD subscales (all $ps > .31$), indicating no overall change in family functioning from baseline to EOT across treatments and informants. Several main effects for informant type were revealed, indicating differences between family members across treatment and time points for *Affective Responsiveness*, *Communication*, *Behavior Control*, *Affective Involvement*, and *Roles* subscales (all $ps < .05$). Given that these informant differences were expected and were already explored at baseline, these main effects were not explored any further.

A two-way time x treatment interaction was observed for two subscales: *Communication* ($F(1, 82) = 5.20, p = .03$) and *Behavior Control* ($F(1, 82) = 7.41, p = .008$); Figure 1 depicts these interactions. For both subscales, participants in FBT experienced an improvement in family functioning compared to a slight worsening on these subscales in AFT. No other time x treatment interactions were observed, indicating no differences between treatment groups in change in other FAD subscales from baseline to EOT. A three-way time x treatment x informant interaction was found with the *Affective Involvement* subscale ($F(2, 81) = 3.80, p = .03$), suggesting that mother-reported *Affective Involvement* decreased in FBT and increased in AFT (see Figure 2). No other significant three-way interactions were identified, indicating no other change in family functioning that varied by treatment group and informant.

Change in family functioning associated with full remission at EOT

Despite the lack of significant change in family functioning overall, individual change in several aspects of family functioning were associated with full remission at EOT. Greater improvements in adolescent-reported *General Functioning* ($OR = 7.617, p = .02$), *Roles* ($OR = 21.917, p = .007$), *Behavior Control* ($OR = 11.187, p = .01$), and *Affective Involvement* ($OR = 8.821, p = .007$) were associated with greater odds of being fully remitted at EOT, regardless of treatment received and after controlling for baseline levels of the variable. Greater improvements in father-reported *Problem Solving* ($OR = 49.239, p = .02$) and both parents' *General Functioning* (father's $OR = 17.691, p = .02$; mother's $OR = 0.059, p = .01$) were associated with greater odds of being fully remitted at EOT, regardless of treatment received and after controlling for baseline levels of the variable. Change in father-reported *Problem Solving* interacted significantly with treatment condition, after controlling for the main effects of treatment condition, baseline problem-solving, and change in the variable ($OR < 0.001, p = .03$). Specifically, families with greater change in paternal problem solving (i.e., positive change during treatment) were as likely to be remitted in both treatments at EOT but families with lesser change in paternal problem solving (i.e., no change or negative change during treatment) were less likely to be remitted in AFT compared to FBT.

When all significant variables were examined in one model, three retained their significant association with full remission at EOT, controlling for baseline levels: adolescent-reported change in *Roles* ($OR = 184.826, p = .02$) father-reported change in *Problem Solving* ($OR = 85.927, p = .04$), and mother-reported change in *General Functioning* ($OR = 0.027, p = .03$); overall model: $X^2(9, N = 84) = 44.892, p < .001$.

Discussion

The purpose of this study was to examine the role of family functioning in the treatment of adolescent AN across family members' perspectives. Results from this study indicate that nearly half of families dealing with AN experience some impairment in family functioning, though average family functioning ratings were only slightly elevated compared to established impaired functioning cutoffs. Further, results suggest that adolescents' perspectives on family functioning reflect greater family dysfunction compared to parental ratings. Indeed, adolescent ratings exceeded cutoffs more frequently than parent ratings, and average impairment ratings were significantly higher than at least one parent's rating on four of seven family functioning subscales. Greater adolescent-reported general family functioning impairment was uniquely related to poorer baseline psychosocial functioning and greater clinical severity. Additionally, across family members, FBT had a more advantageous impact on several specific aspects of family functioning compared to AFT. Finally, improvement in several aspects of family functioning across family members was associated with full remission at the end of treatment, regardless of treatment received.

As anticipated, family members in the current study reported some impairment in family functioning at baseline. Average scores for at least one family member were slightly higher than impaired functioning cutoffs⁴⁴ on five out of seven aspects of family functioning, with one-third to two-thirds of the sample reporting impairment in these areas. However, mean scores on all subscales were very similar to non-clinical norms⁴³ (see Table 1), and standard deviations were small (most were less than 0.5). Therefore, this suggests that impairment in family functioning may be relatively low across this sample. This is somewhat inconsistent with previous research, which has generally found that families of adolescents with AN report greater family functioning impairment in multiple areas compared to community norms¹⁻³ and non-psychiatric controls.⁴⁻¹⁰ The lack of a non-clinical comparison group in the current study and the differences in measures used to assess family functioning across studies limit many direct comparisons to previous research. A closer examination of specific studies that utilize the FAD to assess family functioning in eating disorder samples reveals that mean scores in the current study are similar to those previously published in child and adolescent studies,^{2,4,18} as well as one adult study.¹⁴ Other research on adults with eating disorders reports greater FAD impairment compared to the current sample.^{8, 9, 20,21} Thus, it appears that family functioning in the present study may be similar to that of other adolescent samples but less pathological than that of adult samples. Regardless, these data suggest that over time, dealing with AN may result in some impaired family dynamics.

Consistent with previous research, adolescents in the current study reported greater family functioning impairment than their parents,^{16,22,46, 47} and concordance on various aspects of family functioning among family members was low.^{2,4, 20,22} When mean scores were compared directly, adolescents reported poorer communication compared to both parents and poorer behavioral control and more inappropriate affective involvement compared to mothers. Adolescents and their fathers also reported greater impairment in affective responsiveness compared to mothers. The results of this study provide additional evidence that there are many discrepancies in family member viewpoints about current functioning. It is particularly relevant that with a few exceptions, adolescent (but not parent) ratings of

global family functioning were significantly associated with more severe eating disorder symptoms (general eating disorder psychopathology, eating-related obsessive-compulsive symptoms, and bulimic pathology), greater depressive symptoms, more functional impairment, and lower self-efficacy and self-esteem.

This study is one of only three to examine the differential impact of various family member reports of functioning on clinical characteristics.^{16,21} Further, this is the first study to suggest the unique importance of the adolescent's view of family functioning in its relationship to broader clinical severity. In the context of previous research, one interpretation might be that adolescent perceptions are of the greatest clinical importance, given that adolescent-reported family functioning is a better predictor of the presence or absence of an eating disorder compared to parent-reported family functioning.⁹ Therefore, it is possible that the adolescent's view of family functioning, while the most negative, is also the most clinically relevant. However, it is also likely that the adolescent's view of family functioning is negatively skewed by the stress of the illness or distorted cognitions related to the eating disorder or other psychopathology (e.g., depressive symptoms). Although we cannot determine causality, results of this study may suggest that as clinical symptoms worsen and psychosocial functioning deteriorates, the patient begins to perceive greater family dysfunction. This is consistent with previous research in eating disorder samples finding that greater reported family impairment is reported concurrently with greater eating disorder psychopathology,^{6,10,17} bulimic symptoms,^{2,18–20} and depressive symptoms.^{20,21} While adolescents' view of the family could be directly impaired by their current illness in a way that parental views of the family are not, adolescents may also report more family impairment because they have less power within the family, or they may report greater impairment across all measures as a reflection of greater general distress or a response tendency to report more negatively on all measures.

In the current study, improvement in three specific aspects of family functioning was uniquely associated with successful treatment outcome, suggesting that as symptoms improve, so does perception of family dynamics. Greater improvement in father-reported *Problem Solving*, mother-reported *General Functioning*, and adolescent-reported *Roles* were linked to greater odds of being fully remitted at the end of treatment, regardless of the type of treatment received and when adjusting for baseline levels of these family dynamics. This suggests that the family environment improves in patients who recover, both in family therapy where this issue is discussed regularly and also in an individual treatment that does not directly target family dynamics. This is in keeping with previous research that improvement in family functioning is associated with recovery in adolescent AN.^{31,32} The current study thus adds to our limited understanding of family functioning in treatment outcome for adolescent AN, suggesting that improvement is perceived by multiple family members and occurs in conjunction with recovery.

Several aspects of family functioning were improved with FBT in the current study. Families treated with FBT reported an improvement in behavior control (i.e., the clarity and appropriateness of rules) and communication relative to families treated with AFT. In fact, in AFT, these facets of family functioning were slightly worse after treatment as reported across family members. In addition, mothers reported an improvement in affective

involvement (i.e., the clarity and appropriateness of emotional involvement between family members) relative to other family members when receiving FBT compared to AFT. These specific improvements within FBT are not surprising clinically, as this treatment directly addresses the clarity of rules within the family and the clarity and directness of verbal exchanges. Particularly in the early stages of FBT, sessions are spent getting the entire family on the “same page” regarding limits set around meals and expected weight gain. Furthermore, direct communication is modeled and encouraged.

It is somewhat difficult to compare the results of this study to previous studies, given mixed results. A few studies have found no improvement or even a deterioration in family functioning after treatment,^{16,33} while other studies have demonstrated improvements with FBT and similar therapies^{30, 31,32} as well as individual therapy.³² Our results converge with previous research suggesting that family dynamics can improve during family therapy for adolescent AN, but they diverge from previous work and suggest no direct positive impact on family dynamics for adolescents who received individual treatment. Given that the aspects of family functioning improved by FBT were not related to remission overall, it is not clear whether change in family dynamics facilitates recovery or is simply reflective of greater symptom improvement in FBT compared to individual treatment.

Some limitations to this study should be noted. First, although family functioning was assessed using a well-validated self-report measure, our data do not address whether changes perceived by family members were actually observable within families. This study was also composed entirely of treatment seeking adolescents and their families. All adolescents were medically stable for outpatient treatment with relatively low psychiatric comorbidity (26% had a comorbid psychiatric diagnosis), which may limit the generalizability of these findings. For example, it is possible that greater family impairment would be seen in patients with more severe medical complications or multiple psychiatric concerns. An additional limitation of this study is the large number of statistical tests conducted in these analyses, and results should be interpreted cautiously with this in mind. Strengths of this study include a relatively large sample size for a study of adolescent AN. In addition, this study utilized available data from multiple informants to understand the relative importance of different family member reports on family functioning, which is an improvement over previous approaches using patient-only information or an average across all family members. Finally, the assessments used were reliable and well-validated.

The findings from this study suggest that families seeking treatment for adolescent AN report some family functioning impairment and that FBT may be effective in improving some aspects of family dynamics. In particular, FBT improved all family members’ perception that communication was clearer and more direct and that there was increased clarity and appropriateness regarding rules about behavior. Additionally, mothers in FBT reported improvement in emotional over-involvement within the family. Further, patients who were recovered at the end of treatment were also more likely to report positive change in family functioning (i.e., patient-perceived improvement in clarity about roles within the family, father-perceived improvement in problem solving, and mother-perceived improvement in general family functioning), regardless of treatment type. This study does not suggest that family functioning impairment was causal in the development of AN.

Rather, concurrent improvement of family functioning and eating disorder symptoms across the two treatments suggests that family functioning may be related to the severity of eating disorders symptoms. Further research is needed to evaluate how and when improvements in family functioning occur in treatment, and in particular whether improvements may mediate treatment outcome in FBT. Research should continue to explore the important relationship between family functioning and outcome in adolescent eating disorder treatment, and how to better support families who are coping with eating disorders throughout treatment.

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Figure 1.

Mean scores on *Communication* and *Behavior Control* subscales of the Family Assessment Device at baseline and end of treatment by treatment group [$N = 84$; Adolescent-Focused Therapy (AFT) $N = 39$; Family-Based Treatment (FBT) $N = 45$]. Higher scores indicate greater impairment.

Figure 2.

Mean scores on the *Affective Involvement* subscale of the Family Assessment Device by informant (father, mother, or adolescent) at baseline and end of treatment for the Adolescent-Focused Therapy (AFT) group ($N = 39$) and the Family-Based Treatment (FBT) group ($N = 45$). Higher scores indicate greater impairment.

Whole sample baseline family functioning subscales by informant compared to non-clinical norms^a and published cutoffs^b**Table 1**

	Non-Clinical Norm ^a	Impaired Functioning Cutoff ^b	Sample Mean (SD)	Percent Above Cutoff
General Functioning	1.96	2.0	Father 2.00 (0.37) Mother 2.01 (0.38) Adolescent 2.02 (0.53)	39.4 48.7 48.3
Problem Solving	2.20	2.2	Father 2.09 (0.32) Mother 2.06 (0.38) Adolescent 2.12 (0.44)	28.4 31.1 30.8
Communication	2.15	2.2	Father 2.16 (0.31) Mother 2.15 (0.35) Adolescent 2.27 (0.43)	47.7 48.7 60.0
Roles	2.22	2.3	Father 2.24 (0.30) Mother 2.31 (0.36) Adolescent 2.16 (0.32)	40.4 48.7 30.8
Affective Responsiveness	2.23	2.2	Father 2.11 (0.45) Mother 1.96 (0.45) Adolescent 2.13 (0.50)	38.5 27.7 35.8
Affective Involvement	2.05	2.1	Father 2.14 (0.42) Mother 2.07 (0.39) Adolescent 2.20 (0.50)	54.1 56.3 60.0
Behavior Control	1.90	1.9	Father 1.89 (0.39) Mother 1.85 (0.37) Adolescent 1.96 (0.40)	47.7 43.7 55.0

^a = Non-clinical norms published in Epstein et al., 1983^b = Impaired functioning cutoffs as established by Miller et al., 1985Note: Baseline sample size by informant: father $N = 109$; mother $N = 119$; adolescent $N = 120$