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Authors

Rienecke, Renee D
Gorrell, Sasha
Johnson, Madelyn
et al.

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Expressed emotion and treatment outcome in higher levels of care for eating disorders

Renee D. Rienecke, PhD[1,2], **Sasha Gorrell, PhD**[3], **Madelyn Johnson, BS**[3], **Alan Duffy, MS**[1], **Philip S. Mehler, MD**[1,4,5], **Daniel Le Grange, PhD**[3,6]

[1]Eating Recovery Center/Pathlight Mood & Anxiety Center, Denver, Colorado, USA

[2]Department of Psychiatry and Behavioral Sciences, Northwestern University, Chicago, Illinois, USA

[3]Department of Psychiatry and Behavioral Sciences, University of California, San Francisco, San Francisco, California, USA

[4]ACUTE Center for Eating Disorders at Denver Health, Denver, Colorado, USA

[5]University of Colorado School of Medicine, Denver, Colorado, USA

[6]Department of Psychiatry & Behavioral Neuroscience, The University of Chicago, Chicago, Illinois, USA

Abstract

Objective: Expressed emotion (EE) among caregivers toward the affected offspring is a negative prognostic indicator for adolescent patients with eating disorders (EDs) in outpatient treatment. Less research has examined its impact on adolescents in higher levels of care (HLOC). The current study examined differences in caregiver EE according to the subtype of anorexia nervosa (AN) (restricting [AN-R] versus binge/purge [AN-BP]), and level of care (LOC). We also examined the main effects of baseline caregiver EE (emotional overinvolvement [EOI] or criticism), AN subtype, and their interaction on eating pathology and depression at discharge.

Method: Adolescent patients ($N = 203$) receiving treatment at HLOCs completed measures of ED pathology (Eating Disorder Examination-Questionnaire) and depression (Patient Health Questionnaire-9) at baseline and discharge, and one caregiver of each patient completed a measure of EE (Family Questionnaire) at baseline.

Results: No differences in caregiver EE were found between patients with AN-R versus AN-BP, or relative to LOC. Caregiver EE did not predict outcome for ED symptoms or depression at discharge.

Discussion: The impact of high caregiver EE may be less substantial at HLOCs than outpatient care given that caregivers are less involved in treatment at HLOCs. Future research is needed to

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Correspondence: Renee D. Rienecke, Eating Recovery Center/Pathlight Mood & Anxiety Center, 333 N. Michigan Avenue, Ste. 1900, Chicago IL 60601, USA. renee.rienecke@ercpathlight.com.

AUTHOR CONTRIBUTIONS
Sasha Gorrell: Formal analysis; writing – original draft; writing – review and editing. **Madelyn Johnson:** Data curation; writing – review and editing. **Alan Duffy:** Data curation; writing – review and editing. **Philip Mehler:** Writing – review and editing. **Daniel Le Grange:** Writing – review and editing.

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determine if high caregiver EOI leads to poor treatment outcome for adolescents as it does for adults, or whether it is an appropriate expression of care for patients who are ill enough to require HLOC treatment.

Public significance statement: High caregiver EE was not found to predict treatment outcome for adolescents with eating disorders in higher levels of care (HLOCs), possibly due to the limited involvement of caregivers in HLOCs. However, patients step down to outpatient treatment, where high caregiver EE can have a significant negative impact on outcome. HLOCs should incorporate efforts to reduce high caregiver EE in anticipation of step-down to outpatient treatment.

Keywords

adolescents; anorexia nervosa; criticism; eating disorders; emotional overinvolvement; expressed emotion; treatment outcome

1 | INTRODUCTION

Expressed emotion (EE) is a measure of a caregiver’s behaviors, feelings, and attitudes toward a relative with a medical or psychiatric disorder and was originally studied among caregivers of adults with schizophrenia (Brown et al., 1972). Caregivers with elevated scores beyond a specified threshold on the subscales of emotional overinvolvement (EOI), hostility, or critical comments, are considered to be high on EE. Warmth and positive remarks are additional components of the original construct of EE but are not factored into the determination of whether a relative is high on EE. Although warmth has been found to be associated with good treatment outcome for adolescents with EDs in outpatient care (Le Grange et al., 2011), as well as for adult patients with psychosis (Butler et al., 2019; López et al., 2004), it has been found to be negatively correlated with critical comments and thus was not included in the original calculation of EE (Brown et al., 1972). This is unfortunate, as EE now has a largely negative connotation (Leff, 1989) and the impact of warmth and positive remarks has been under researched. Since the early work on EE among families of patients with schizophrenia, high caregiver EE has been shown to be an indicator of poor prognosis across many psychiatric diagnoses (Hooley, 2007; Wearden et al., 2000), including eating disorders (EDs) (Rienecke, Accurso, et al., 2016). In outpatient settings, high EE is present at baseline in 29%–47% of at least one caregiver with a child with anorexia nervosa (AN) (Allen et al., 2018; Le Grange et al., 2011; Philipp et al., 2020; Rienecke, Accurso, et al., 2016).

Much of the research on EE and EDs has been conducted in outpatient samples, with many studies specifically focusing on adolescents with AN receiving family therapy or family-based treatment (FBT) (Allen et al., 2018; Eisler et al., 2007; Le Grange et al., 1992; Le Grange et al., 2011; Szmukler et al., 1985). For instance, Eisler and colleagues found that among adolescent patients with AN, those from families with high levels of maternal criticism had gained less weight at five-year follow-up if they were in conjoint family therapy (patient and caregivers seen together) as opposed to separated family therapy (patient and caregivers seen separately), while Le Grange et al. found that caregiver warmth was related to positive treatment outcomes for adolescents with AN.

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Treasure and colleagues have done a great deal of work on EE among caregivers of patients with EDs. However, many of these studies have been with caregivers of adults, or have not specifically focused on adolescents (Goddard et al., 2011; Keshen et al., 2020). Caregiver EE may be particularly relevant to treatment outcomes in the context of family-based interventions for adolescents, in which caregivers play a crucial and active role in the recovery process, as opposed to individual forms of treatment, such as cognitive-behavioral therapy, where the onus for recovery is more the responsibility of the adolescent patient. In addition, the role of caregiver EE in treatment outcome has been less extensively studied in higher level of care (HLOC) ED treatment settings, such as inpatient (IP), residential (RES), or partial hospitalization (PHP) programs. The impact of caregiver EE could conceivably be less influential due to the more limited nature of caregiver involvement in HLOC settings. Considering the negative impacts with which high EE is associated, and the high recidivism rate found in patients with EDs, it is important to further our understanding in HLOC treatment settings to help improve treatment outcomes via informed therapeutic approaches.

EE has been shown to be a modifiable treatment target. For example, maternal criticism has been shown to be related to ED psychopathology (Rienecke & Richmond, 2017), suggesting that EE may decrease if symptoms improve. Indeed, caregiver EE can change over the course of treatment for EDs (Moskovich et al., 2017). However, it has been found to revert back to pre-treatment levels over time (Schwarte et al., 2017), consistent with findings in the schizophrenia literature that EE may show temporal stability, particularly for fathers (Santos et al., 2001), although other studies have found that some caregivers do show changes in EE over time, most often changing from high EE to low EE (Scazufca & Kuipers, 1998).

Most studies examining treatment outcomes for adolescents with EDs have focused on ED symptoms, but not comorbid symptoms. However, high rates of psychiatric comorbidity are found among patients with EDs. Almost half (47.3%) of adolescent patients with AN report a co-occurring lifetime psychiatric disorder, with mood disorders being the most common (Bühren et al., 2014; Swanson et al., 2011). In addition, early changes in depression have been found to impact treatment outcomes among adolescent inpatients with AN. Patients whose depression levels did not improve after 1 month of inpatient treatment were more likely to be rehospitalized for AN during the following 12 months (Kahn et al., 2020). The presence of comorbid depression has also been found to be a negative predictor of clinically significant improvement in ED symptomatology (Schlegl et al., 2016), and associated with less rapid weight gain for adolescents and young adults with AN (Berona et al., 2018). In addition, a systematic review found that depression was a negative predictor of weight gain (Eskild-Jensen et al., 2020). High caregiver EE has been found to be associated with more depressive symptomatology among adolescents (McCleary & Sanford, 2002). These authors did not find high EE to be associated with treatment outcome, but others (Rapp et al., 2021) have found that adolescents’ perception of high levels of caregiver criticism was associated with elevated depressive symptoms among adolescents 18 months after a 6-month treatment for depression. Investigating comorbid depressive symptoms in addition to ED symptoms is useful when considering the complete picture of treatment outcomes.

The current study had two objectives. First, we sought to characterize caregiver EE (either EOI or Criticism) according to diagnosis and LOC. Based on prior work suggesting

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associations between elevated EE and bulimia nervosa (BN) (Rienecke, Sim, et al., 2016), we anticipated that caregivers of those diagnosed with AN-binge/purge type (AN-BP) would report higher EE compared to those diagnosed with AN-restricting type (AN-R). In terms of LOC, although little is known about EE in HLOC ED settings, we anticipated that both forms of EE would be higher among caregivers of adolescents in the highest level of treatment (i.e., IP). This hypothesis is based on research finding that maternal EE is influenced by symptom severity (King, 2000), although it is also possible that high EE exacerbates symptom presentation. Second, we examined the main effects of baseline EE (high vs. low EOI or Criticism), diagnostic group (AN-R vs. AN-BP), and their potential interaction on reported depression or global eating pathology at end-of-treatment (EOT). We hypothesized that those with AN-BP and high caregiver EOI or high Criticism would demonstrate poorer treatment outcomes, characterized by higher scores on measures of depression and ED symptoms. This information is important given the high aforementioned recidivism rates found in EDs and the potential for shaping treatment outcomes by altering high caregiver EE.

2 | METHOD

2.1 | Participants and procedure

The study population for analyses comprised treatment-seeking male and female-identifying adolescents with a DSM-5 (APA, 2013) ED diagnosis of AN-R or AN-BP who were enrolled in HLOC treatment for their ED between February 2021 and April 2022, and one of the patient’s caregivers. These data were drawn from a larger pool of patients ($N = 447$), from which the current analytic sample was delineated to include only those with valid self-report of depression symptoms at discharge ($N = 203$); no significant group differences between individuals with complete vs. missing depression data at discharge were evidenced, relative to relevant variables of interest (i.e., age, LOC, baseline values for ED pathology, depression, and both types of EE). Of the 203 caregivers who completed the FQ at baseline, 61 (30%) completed this measure at discharge. At baseline, 84 caregivers (39.6%) were high on both EOI and Criticism, and 168 (79.2%) caregivers were high on either EOI *or* Criticism. There were no statistically significant differences between caregivers who completed the FQ at discharge vs. those who did not, relative to EOI or Criticism scores at baseline, or the proportion of those who met the cutoff for being high in EOI or Criticism, or patient LOC, age, baseline or discharge EDE-Q, or baseline or discharge PHQ-9.

At the time of data collection, the overall treatment program consisted of 16 distinct adolescent ED treatment facilities across the United States. At the time of treatment intake and upon discharge, patients provided clinical and demographic information to treatment center staff according to standard assessment procedures. Caregivers and adolescents provided informed consent or assent to participate in this study that was granted expedited approval by the Salus Institutional Review Board.

2.2 | Diagnosis

Trained staff (masters level clinicians, licensed or working toward licensure) conducted semi-structured interviews that are part of standardized assessment protocols used to assess

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symptom presentation and provide diagnoses. When ED and comorbid symptoms were endorsed, the clinician obtained further details to aid in establishing a diagnosis, according to DSM-5 criteria.

2.3 | Treatment

Patients were involved in treatment at the IP (n = 48), RES (n = 116), or PHP (n = 39) levels of care, depending on medical and clinical acuity and percent expected body weight (%EBW). Treatment at all levels includes individual therapy twice a week, weekly family therapy, twice weekly psychiatrist visits (daily for inpatients), weekly sessions with registered dietitians, meetings with the medical physician as medical concerns arise, and 3–4 hours of evidence-based skills groups per day. Groups include interventions based on exposure and response prevention, acceptance and commitment therapy, and dialectical behavior therapy. Patients receive three supervised meals and 2–3 supervised snacks daily. All patients see a psychiatrist to monitor medications and to manage comorbid psychiatric conditions. Inpatients see a psychiatrist daily and RES and PHP patients meet with a psychiatrist a minimum of twice per week. Caregivers of patients at the IP and RES levels do not stay with their children during their treatment.

2.4 | Measures

The Family Questionnaire (FQ) (Wiedemann et al., 2002) is a 20-item self-report measure of caregiver EE. As criticism is often considered to be the most important component of EE (Brown et al., 1972; Hooley & Teasdale, 1989) and is usually highly correlated with hostility (Van Humbeeck et al., 2002), several measures of EE, such as the FQ, only assess criticism and EOI. Ten items on the FQ assess criticism and ten assess EOI. Questions are answered on a 4-point scale from “never/very rarely” to “very often” and include items such as, “He/she irritates me” (criticism) and “I regard my own needs as less important” (EOI). Higher scores indicate higher EE. Wiedemann et al. (2002) suggest a cutoff of 23 for high criticism and 27 for high EOI. These cut-offs were used to delineate caregivers who were high EE vs. low EE in each of these two domains. In terms of classifying caregivers as high versus low EE, the FQ has been shown to have good agreement with the Camberwell Family Interview (CFI) (Brown & Rutter, 1966), the gold-standard assessment for EE, and the FQ has good internal consistency (Wiedemann et al., 2002). In the current sample, Cronbach’s α = .895. This measure was completed by caregivers at admission and discharge; due to low completion rates by parents at discharge, in this study we only report on admission values.

The Eating Disorder Examination–Questionnaire (EDE-Q) (Fairburn & Beglin, 1994, 2008) is a widely-used self-report measure assessing the cognitive and behavioral psychopathology of EDs over the previous 28 days. Responses on 22 items are on a 7-point scale, anchored by 0 (no days) and 6 (every day); higher scores reflect greater eating-related pathology. Six additional items measure the behavioral aspects of the ED, such as purging or laxative use. The measure has four subscales: Restraint, Eating Concern, Shape Concern, and Weight Concern, and a Global score (used in the current study). Study of the EDE-Q has demonstrated strong psychometric properties when compared to the use of a clinical interview in patient samples (Berg et al., 2012) and in the current sample, Cronbach’s α = .842.

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The Patient Health Questionnaire–9 (PHQ-9) (Kroenke et al., 2001) is a 10-item self-report measure of depression severity. Nine items are measured on a 0 (not at all) to 3 (nearly every day) scale and inquire about symptoms such as “feeling tired or having little energy” over the previous 2 weeks. Higher scores indicate greater depressive symptomatology. The tenth item asks how difficult the depressive symptoms have made it for the individual to function, on a 4-point scale from “not difficult at all” to “extremely difficult”. Depression categories include “minimal depression” (scores of 1–4), “mild depression” (scores 5–9), “moderate depression” (scores 10–14), “moderately severe depression” (scores 15–19), and “severe depression” (scores 20–27). The PHQ-9 has been shown to have excellent internal reliability and test-retest reliability (Kroenke et al., 2001) and in the current sample, Cronbach’s $\alpha = .890$. As an established and valid measure for depressive symptoms in the general population (Martin et al., 2006), the PHQ-9 is also recommended as a depression assessment tool for adolescents (Allgaier et al., 2012).

2.5 | Analytic plan

Means, standard deviations, and frequencies were calculated for study variables of interest and Pearson χ^2 tests and t-tests were used to determine potential between-group differences in EE, depression, and eating pathology at admission, as well as differences in EE relative to diagnosis and LOC (Objective 1). Based on the expected correlation of the two subscales of EE ($r = .52$, $p < .001$) and concerns for multicollinearity, we opted to conduct further analyses in separate regression models. Two multivariate regression models (MANOVA) were used to evaluate the main effects of EE status, diagnostic group, and their potential interaction on treatment outcomes (Objective 2). Specifically, in Model 1, we examined associations among baseline Criticism (coded as a binary variable: 0 = low, 1 = high), diagnostic Group (coded as a binary variable: AN-R = 1, AN-BP = 2), and their interaction (Group x Criticism) with outcomes of depression (PHQ-9 score) and eating pathology (EDE-Q Global score) at EOT. For Model 2, we examined associations among baseline EOI (coded as a binary variable: 0 = low, 1 = high), diagnostic Group (coded as a binary variable: AN-R = 1, AN-BP = 2), and their interaction (Group x EOI) with outcomes of depression (PHQ-9 score) and eating pathology (EDE-Q Global score) at EOT. In each model, we entered LOC (IP, RES, PHP) along with baseline PHQ-9 and EDE-Q Global scores to account for variability in these variables that could systematically impact post-treatment change. SPSS v. 27 was used for all analyses.

3 | RESULTS

3.1 | Sample characteristics and preliminary analyses

Descriptive statistics are shown in Table 1. A majority of the sample were diagnosed with AN-R ($n = 166$, 82%). For the full sample, age ranged from 11 to 17 years, M (SD) = 14.78 (1.57), and the majority were cisgender females (90.1%), and white (87.7%). Of the total sample ($N = 203$), 188 (93%) adolescents completed the EDE-Q at admission, and 200 (99%) at discharge; for the PHQ-9, 188 (93%) adolescents completed this measure at admission and 203 (100%) at discharge. Mean EDE-Q Global ($p = .003$) and PHQ-9 ($p = .01$) scores were significantly higher at baseline for those diagnosed with AN-BP compared to those diagnosed with AN-R; these between-group differences for both measures were non-significant at EOT (*p*s > .05).

3.2 | Objective 1: Evaluate differences in EE status relative to diagnosis and LOC

Results from independent samples *t*-tests showed that when comparing mean scores for the subscales of Criticism ($p = .32$) or EOI ($p = .24$), there were no significant differences relative to diagnostic group (see Table 1). Further, Pearson χ^2 tests evaluating whether the likelihood of having high or low EE status (according to cutoff scores) differed relative to diagnostic group showed no significant differences for Criticism, Pearson $\chi^2 = 0.34$, $df = 1$, $p = .56$, or for EOI, Pearson $\chi^2 = 0.001$, $df = 1$, $p = .98$.

A χ^2 test of associations between Criticism and LOC was non-significant ($p = .17$). The proportion of those caregivers reporting high Criticism was greatest in the RES level for both the full sample (29%), and for when considering the proportion within LOC (50%). A χ^2 test was also non-significant for associations between EOI and LOC ($p = .12$). Here, the greatest proportion was at the RES level (43%) in the total sample, and the highest proportion was at the IP level (85%) when considering all levels of care (see Table 1).

3.2.1 | MANOVA analyses

Objective 2: Evaluate main effects of EE status, diagnosis, and their potential interaction on depression and eating pathology at EOT: Full results from both regression models including univariate tests are available in Table 2. For all omnibus tests, we report values for Pillai's Trace. Box's test was not significant for Model 1 ($p = .76$) or Model 2 ($p = .90$), indicating that we could assume equal covariance across the sample, despite unequal group size. Levene's test of equality of variances was non-significant for both dependent variables in both models, supporting this assumption was met.

Model 1 Criticism.: The omnibus test of the main effect of Criticism was not significant, V = .006, $F(2,177) = 0.51$, $p = .60$, $\eta^2 = .006$. The main effect of diagnostic Group was also not significant, V = .009, $F(2,177) = 0.79$, $p = .46$, $\eta^2 = .009$, and the interaction of Criticism by Group was not significant, V = .021, $F(2,177) = 1.91$, $p = .15$, $\eta^2 = .021$. Significant main effects were evidenced for the covariates of baseline scores for EDE-Q, V = .28, $F(2,177) = 33.77$, $p < .001$, $\eta^2 = .276$, and PHQ-9, V = .254, $F(2,177) = 30.20$, $p < .001$, $\eta^2 = .254$, and we detail their univariate tests in Table 2.

Model 2 EOI.: The omnibus test of the main effect of EOI was not significant, V = .002, $F(2,177) = 0.207$, $p = .81$, $\eta^2 = .002$. The main effect of diagnostic Group was also not significant, V = .012, $F(2,177) = 1.09$, $p = .34$, $\eta^2 = .012$, and the interaction of EOI by Group was not significant, V = .003, $F(2,177) = 0.24$, $p = .79$, $\eta^2 = .003$. Significant main effects were evidenced for the covariates of baseline scores for EDE-Q, V = .28, $F(2,177) = 33.89$, $p < .001$, $\eta^2 = .277$, and PHQ-9, V = .258, $F(2,177) = 30.82$, $p < .001$, $\eta^2 = .258$, and we detail their univariate tests in Table 2.

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4 | DISCUSSION

The purpose of the current study was twofold: (1) to examine differences in caregiver EE relative to AN diagnosis subtype and LOC, and (2) to assess the effects of baseline caregiver EE, diagnostic group, and their interaction on ED and depressive symptoms at EOT. Contrary to hypotheses, caregivers of patients with AN-BP did not exhibit higher levels of baseline EE when compared to caregivers of patients with AN-R. This hypothesis was based on previous findings that caregivers of patients with BN were more critical of their offspring than caregivers of patients with AN (Rienecke, Sim, et al., 2016). Similarly, Dare et al. (1994) found a trend toward mothers of patients with BN expressing more criticism toward their children than mothers of patients with AN. They suggested that because patients with AN are often clearly underweight, frail, and unwell, caregivers may be less inclined to act in a critical way toward these patients than toward patients with BN who are ill, but may outwardly look healthy. Significant low weight across AN subtypes might in part explain the lack of significant differences between patients with AN-R and AN-BP in the current study. To date, no other studies have examined differences in caregiver EE according to AN subtype. The current study suggests that caregiver EE does not differ between AN subtype, although further research is needed to replicate these findings.

Regarding differences in caregiver EE according to LOC, no differences were found for caregiver criticism or EOI. For EOI, the highest rates were found for patients at the IP level and decreased at each lower LOC. Caregiver EOI refers to overprotective or self-sacrificing/overly devoted behavior, and/or excessive emotionality (Leff & Vaughn, 1985), and historically has been found to be problematic for adults. For example, in a seminal study of EE and EDs, EOI was found to be associated with treatment dropout among adult patients (Szmukler et al., 1985), and has been found to be associated with relapse in adults with schizophrenia (King & Dixon, 1999). However, a review of EOI among caregivers of adolescents, with a range of psychiatric and medical illnesses, failed to find clear evidence of an association between high levels of EOI and poor outcomes, with some studies even reporting improved outcomes for adolescents whose caregivers were high on EOI (Rienecke, 2020). It is possible that the higher levels of EOI found in the current study reflect appropriate caregiver concern when their child is ill enough to require treatment at the IP or RES level. Future research might further determine whether EOI should still be considered a problematic aspect of EE for adolescents.

While criticism scores were below the cutoff of 23 for all LOCs, EOI scores were above the cutoff of 27 for all levels. Given considerable missing data for caregivers who did not complete EE at discharge, as well as a lack of assessment time points for EE during the course of treatment, we were unable to examine changes in EE over time. However, it seems possible that levels of EOI decreased as patients stepped down to lower LOCs, possibly reflecting decreased caregiver distress as patients improved throughout treatment. While speculative, if EOI is indeed a reflection of appropriate caregiver worry for adolescents with an ED requiring inpatient treatment, then this may be a positive finding, preferable to high rates of criticism, and it may be of value to insinuate these teachings into the course of treatment.

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Finally, caregiver EE and diagnosis were not related to treatment outcomes for either ED or depressive symptoms. The EE findings are in contrast to several outpatient studies of adolescents with EDs (Eisler et al., 2007; Le Grange et al., 2011; Rienecke, Accurso, et al., 2016) and may be due to the naturally limited involvement of caregivers at HLOC. However, treatment at HLOC is only part of the treatment process. Patients will step down to outpatient care, where the treatment role of their caregivers may be more substantive and thus the level of caregiver EE may be much more influential. Psychoeducation has been found to improve caregiver EE for patients with EDs (Uehara et al., 2001) and can be incorporated into treatment for adolescents across levels of care and therapeutic modality. The treatment program in the current study offered family education meetings for caregivers; future research should examine whether attendance at these meetings impacted caregiver EE and treatment outcomes.

Several interventions have been designed to reduce caregiver EE, but many of these have been for caregivers of adults with EDs (e.g., Dimitropoulos et al., 2019; Grover et al., 2011; McEvoy et al., 2019; Sepulveda et al., 2010). Interventions for caregivers of adolescents with EDs are limited and have not been shown to be effective in reducing EE (Hodsoll et al., 2017). Consequently, the development of approaches that specifically target high caregiver EE among families of adolescents is much-needed.

Limitations of the current study include the self-report nature of the data and the fact that the data all came from one overarching treatment program, which requires patients to use private insurance or self-pay, possibly limiting the generalizability of the findings, particularly to United States healthcare systems. However, patients did come from several treatment facilities across the country, which could aid in the generalizability of the findings. We did not have information on the socioeconomic status of the patients, and we were also unable to examine changes in EE over time. In addition, we were unable to include patients who attended intensive outpatient programming in the current study (i.e., a common type of HLOC at many treatment centers) due to the small sample sizes available in our data base; inclusion of this LOC in future study is warranted. We were also unable to identify how many caregivers were mothers versus fathers or another type of caregiver. Some studies have found different associations with outcome for maternal vs. paternal EE (Rienecke, 2019; van Furth et al., 1996). Further, we were unable to identify whether caregivers were biological parents, stepparents, grandparents or another type of caregiver. We were also only able to assess one caregiver per patient. It is possible that patients with two caregivers who are high on EE have worse outcomes than those with only one high EE caregiver, and it is possible that one low EE caregiver might play a protective role against the effects of a high EE caregiver, although this has not yet been examined. Strengths of the study include one of the first examinations of the impact of high caregiver EE across HLOCs and the inclusion of widely used, validated measures.

The current study suggests that caregiver EE may not play a significant role in treatment outcomes related to both ED and depressive symptoms at HLOC for adolescents with both subtypes of AN, possibly due to the limited involvement of caregivers in treatment at these levels. However, there remains a strong body of evidence to suggest that caregiver EE is indeed important in the outpatient treatment of adolescents with EDs (Allen et al., 2018;

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Eisler et al., 2007; Le Grange et al., 1992; Le Grange et al., 2011; Rienecke et al., 2016; Szmukler et al., 1985). Therefore, future research should seek to examine ways to address caregiver EE in HLOC in anticipation of patients stepping down to outpatient treatment.

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CONFLICT OF INTEREST

Dr. Rienecke receives consulting fees from the Training Institute for Child and Adolescent Eating Disorders, LLC, and receives royalties from Routledge. Dr. Le Grange receives royalties from Guilford Press and Routledge, is Co-Director of the Training Institute for Child and Adolescent Eating Disorders, LLC, and is a member of Equip Health Clinical Advisory Board. All other authors report no biomedical financial interests or potential conflicts of interest.

DATA AVAILABILITY STATEMENT

Data will be made available upon reasonable request.

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TABLE 1

Descriptive statistics and preliminary analyses ($N = 203$)

Variable	*n* (%)	M (SD)		*n* (%)
Diagnosis			Race/Ethnicity	
AN-R	166 (82)		White	178 (87.7)
AN-BP	37 (18)		Hispanic/Latino	12 (5.9)
			Biracial/Multiracial/Mixed Race	9 (4.4)
Age (range 11–17)		14.78 (1.57)	Asian	2 (1.0)
Gender			Black/African American	1 (.5)
Female	183 (90.1)		American Indian/Native American/Alaska Native	1 (.5)
Male	11 (5.4)			
Nonbinary	5 (2.5)			
FTM	3 (1.5)			
Prefer not to say	1 (.5)			
Length of stay (range 12–188 days)		78 (41)		

Level of care	IP	RES	PHP
n (%) of total sample	48 (23.6)	116 (57.1)	39 (19.2)

	AN-R	AN-BP	
	M (SD)	M (SD)	Test statistic
Eating Disorders Examination - Questionnaire			
Baseline	3.34 (1.68)	4.24 (1.45)	**F (186) = 4.52, $t = -3.11$, $P = .003$**
EOT	2.32 (1.50)	2.45 (1.38)	$F(198) = 0.296$, $t = -0.51$, $p = .61$
Patient Health Questionnaire			
Baseline	13.90 (7.15)	17.44 (6.22)	**F (186) = 2.09, $t = -2.60$, $p = .010$**
EOT	10.21 (6.54)	10.11 (5.84)	$F(201) = 1.12$, $t = 0.09$, $p = .93$

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Expressed emotion by diagnosis	AN-R M (SD)	AN-BP M (SD)	
Criticism baseline	21.64 (6.20)	22.78 (6.47)	$F(201) = 0.14$, $t = -1.00$, $p = .32$

	n (%)	*n* (%)	
Low criticism	94 (46)	19 (9)	$\chi^2(1) = 0.34$, $p = .56$
High criticism	72 (36)	18 (9)	

	M (SD)	M (SD)	
EOI baseline	29.32 (4.12)	30.22 (4.32)	$F(201) = 0.39$, $t = -1.19$, $p = .24$

	n (%)	*n* (%)	
Low EOI	40 (20)	9 (4)	$\chi^2(1) = 0.001$, $p = .98$
High EOI	126 (62)	28 (14)	

Expressed emotion by level of care	IP M (SD)	RES M (SD)	PHP M (SD)
Criticism baseline	21.58 (6.19)	22.58 (6.18)	20.03 (6.70)

	n (%)	*n* (%)	*n* (%)	
Low Criticism	31 (15.3)	58 (28.6)	24 (11.8)	$\chi^2(2) = 3.60$, $p = .17$
% Low Criticism within LOC at admission	64.6%	50.0%	61.5%	
High Criticism	17 (8.4)	58 (28.6)	15 (7.4)	
% High Criticism within LOC at admission	35.4%	50.0%	38.5%	

	M (SD)	M (SD)	M (SD)
EOI baseline	30.04 (3.78)	29.71 (4.19)	28.13 (4.33)

	n (%)	*n* (%)	*n* (%)	
Low EOI	7 (3.4)	29 (14.3)	13 (6.4)	$\chi^2(2) = 4.24$, $p = .12$
% Low EOI within LOC at admission	14.6%	25.0%	33.3%	

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	***n* (%)**	***n* (%)**	***n* (%)**
High EOI	41 (20.2)	87 (42.9)	26 (12.8)
% High EOI within LOC at admission	85.4%	75.0%	66.7%

Note: Bolded test statistics represent values of $p < .05$. For Criticism and EOI across diagnostic group and level of care, percent refers to percent of the total sample unless otherwise noted.

Abbreviations: AN-BP, anorexia nervosa-binge/purge type; AN-R, anorexia nervosa-restricting type; Criticism, subscale of the Family Questionnaire; EOI, Emotional Overinvolvement, subscale of the Family Questionnaire; EOT, end-of-treatment; FTM, transgender - female to male; IP, inpatient; LOC, level of care; PHP, partial hospitalization program; RES, residential.

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TABLE 2

Estimates of effects of expressed emotion and eating disorder diagnosis on treatment outcomes

Source	Outcome variable	Adjusted R^2	*SS*	*Df*	*F*	*P* value	Partial η^2
Model 1 criticism							
Corrected model	*EDE-Q*	.359	147.63	6	18.19	< .001	.380
	PHQ-9	.323	2547.00	6	15.63	< .001	.345
Intercept	*EDE-Q*		9.50	1	7.02	.009	.038
	PHQ-9		179.92	1	6.62	.01	.036
Criticism	*EDE-Q*		1.20	1	0.89	.35	.005
	PHQ-9		0.59	1	0.02	.88	.000
Diagnostic group	*EDE-Q*		0.74	1	0.55	.46	.003
	PHQ-9		42.84	1	1.58	.21	.009
Criticism X diagnostic group	*EDE-Q*		3.86	1	2.85	.09	.016
	PHQ-9		0.004	1	0.00	.99	.000
Level of care	*EDE-Q*		5.17	1	3.82	.05	.021
	PHQ-9		75.58	1	2.78	.10	.015
EDE-Q baseline	*EDE-Q*		70.04	1	51.78	**<.001**	**.225**
	PHQ-9		0.48	1	0.018	.89	.000
PHQ-9 baseline	*EDE-Q*		0.40	1	0.29	.59	.002
	PHQ-9		1330.72	1	48.98	**<.001**	**.216**
Model 2 EOI							
Corrected model	*EDE-Q*	.350	144.33	6	17.54	< .001	.372
	PHQ-9	.325	2559.81	6	15.75	< .001	.347
Intercept	*EDE-Q*		8.89	1	6.48	.01	.035
	PHQ-9		176.14	1	6.50	.01	.035
EOI	*EDE-Q*		0.47	1	0.34	.56	.002
	PHQ-9		0.08	1	0.003	.96	.000
Diagnostic group	*EDE-Q*		1.71	1	1.25	.27	.007
	PHQ-9		53.16	1	1.96	.16	.011
EOI X diagnostic group	*EDE-Q*		0.53	1	0.38	.49	.003
	PHQ-9		9.27	1	0.34	.54	.002

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Source	**Outcome variable**	**Adjusted R^2**	***SS***	***Df***	***F***	***P* value**	**Partial η^2**
Level of care	*EDE-Q*		5.44	1	3.97	**.048**	**.022**
	PHQ-9		80.93	1	2.99	.09	.017
EDE-Q baseline	*EDE-Q*		71.64	1	52.24	**<.001**	**.227**
	PHQ-9		0.44	1	0.02	.90	.000
PHQ-9 baseline	*EDE-Q*		0.20	1	0.14	.71	.001
	PHQ-9		1332.33	1	49.17	**<.001**	**.216**

Note: Bolded values represent $p < .05$. For both Criticism and EOI, low status is the reference group; Diagnostic Group refers to those diagnosed with anorexia nervosa-restricting type (reference group) or anorexia nervosa-binge/purge type; Level of care is a categorical variable referring to inpatient, residential, and partial hospitalization.

Abbreviations: Criticism, subscale of the Family Questionnaire; EDE-Q, Eating Disorders Examination-Questionnaire; EOI, Emotional Over involvement, subscale of the Family Questionnaire; PHQ-9, Patient Health Questionnaire; SS, Type III sum of squares.