# Factors Impacting the Effectiveness of an Adapted Family-Based Eating Disorder Treatment

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## Abstract

**Objective:** The current study examined factors associated with weight recovery and psychological remission in an adapted family-based treatment (FBT) program for eating disorder (ED) clients developed by Dr. Ellen Davis, an ED treatment specialist in private practice (Beery et al., 2019). Specific emphasis was placed on the roles of perfectionism and parental agreement about symptom severity. Exploratory analyses were conducted to identify predictors of recovery.

**Method:** Participants were 20 adolescent/young adult females diagnosed with anorexia nervosa (AN), bulimia nervosa (BN), or eating disorder not otherwise specified (EDNOS) who completed an adapted FBT program. Participants completed ED questionnaires, including the Eating Disorder Inventory-3 (EDI-3; Garner, 2004b) and Eating Disorder Symptom Questionnaire (SXQ; Beery et al., 2019) at intake and end of treatment, and these data were analyzed.

**Results:** Greater parental agreement about symptom severity was positively correlated with weight gain. Perfectionism, as measured by the SXQ, significantly decreased from intake to end of treatment but was not correlated with EDI perfectionism at intake. EDI interpersonal alienation predicted less weight gain, and number of treatment sessions predicted more weight gain. EDI interpersonal insecurity predicted more significant psychological improvement.

**Conclusions:** Implications for future practice include increased focus on both parents' active participation in treatment and on interpersonal issues in ED clients. Discrepancies between EDI- and SXQ-measured perfectionism may indicate inconsistencies between perceived perfectionism (for both clients and their parents) and actual perfectionism and could suggest that FBT does not reduce perfectionism but rather provides healthier goals for clients' perfectionistic tendencies.

# Factors Impacting the Effectiveness of an Adapted Family-Based Eating Disorder Treatment

A concerning number of individuals are dissatisfied with their bodies. Livazović and Mudrinić (2017) found that, among both male and female participants, 52.7% felt overweight and 65.5% wanted to lose weight. However, this problem is more severe for females; whereas Livazović and Mudrinić (2017) found that 73.0% of adolescent female participants were afraid of gaining weight, this fear was present in only 24.3% of male participants. Overall, 48.6% of adolescent girls in their study wanted to be thinner, and other studies (e.g. Lawler & Nixon, 2011) have found desire for thinness to be present in as many as 70% of girls aged 12 to 19 years old. While drive for thinness is generally associated with adolescence and adulthood, Dohnt and Tiggemann (2006) found drive for thinness to be present in girls as young as four years old, illustrating the pervasive nature of drive for thinness and body dissatisfaction.

Body dissatisfaction is a common characteristic of eating disorders (EDs). Livazović and Mudrinić (2017) found that body image dissatisfaction was strongly correlated with anorexic and bulimic behavior. Somewhere between two and five percent of individuals will be diagnosed with an ED during their lifetimes. Many of these EDs manifest in adolescence, and an estimated 2.7% of adolescents aged 13 to 18 years suffer from an ED (Merikangas et al., 2010). Consistent with higher levels of body dissatisfaction in females than in males, females showed a higher prevalence (3.8%) of ED diagnoses than males (1.5%). Lifetime rates are even higher. Hudson et al. (2007) found that 4.4% of adults in their sample had a diagnosable ED.

## Eating Disorder Subtypes

The current study examines three distinct ED diagnoses: anorexia nervosa (AN), bulimia nervosa (BN), and eating disorder not otherwise specified (EDNOS). AN is characterized by an

unhealthily low body weight, fear of weight gain, and perceptual distortion (skewed perception of own weight or appearance). AN has two subtypes: binge-purge type (AN-BP) and restricting type (AN-R). The most obvious difference between the two is that AN-BP is characterized by binge-eating behavior followed by some type of purging behavior (e.g. vomiting, laxative use, etc.) to reduce weight gain, whereas AN-R is not. However, AN-BP is also characterized by more impulsive personality and behavior than AN-R (American Psychiatric Association, 2013; Danner et al., 2016). Like AN-BP, BN is characterized by repeated episodes of binge-eating followed by purging or other weight-reducing behavior. The main difference between AN-BP and BN is that individuals with BN generally have a fairly normal weight, whereas individuals with AN-BP are usually underweight (Yates, 1990). EDNOS[1] refers to the presence of disordered eating that causes significant impairment or distress but does not meet full criteria for any specified disorder (American Psychiatric Association, 2013; Arcelus et al., 2011; Willis, 2014). Hudson et al. (2007) estimated the lifetime prevalence of AN and BN in adults to be 0.6% and 1.0%, respectively. Swanson et al. (2011) found adolescent rates of AN and BN to be slightly lower but comparable, at 0.3% and 0.9%, respectively. Rates of EDNOS are more difficult to determine, as not all studies examine it. In the clinical sample used in the current study, EDNOS accounted for 25% of diagnoses (n = 5).

Body dissatisfaction and perceptual distortion are both considered hallmarks of ED symptomatology, but are not always present concurrently, and their prevalence may vary across different diagnoses. For example, Cash and Deagle (1997) found that individuals with BN tended show higher levels of body dissatisfaction than individuals with AN, although both groups

[1] The diagnosis of EDNOS was split into other specified feeding or eating disorder (OSFED) and unspecified feeding or eating disorder (UFED) in the 2013 update of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013). The current study uses the term EDNOS, as this was the diagnosis used during treatment (Beery et al., 2019).

showed comparable levels of perceptual distortion. This suggests that while both types of EDs involve skewed perceptions of weight, individuals with AN may be more satisfied with their bodies; this is consistent with the fact that individuals with BN generally have fairly normal weights whereas one of the criteria for a diagnosis of AN is unhealthily low body weight (Yates, 1990).

All EDs are potentially life-threatening. In a meta-analysis of 36 studies, Arcelus et al. (2011) found a standardized mortality ratio (ratio of observed to expected deaths) [2] of 1.93 for bulimia nervosa and 1.92 for EDNOS. AN is particularly deadly, with a standardized mortality ratio of 5.86—a rate higher than that of any other psychological disorder (Arcelus et al., 2011; Couturier et al., 2013). This is due in part to the high suicide rate of individuals with this disorder. Arcelus et al. (2011) found that one in five deaths among individuals diagnosed with AN was a result of suicide. The full recovery rate for AN is about 46%. About 34% of individuals with AN show partial recovery but retain some symptoms, and the remaining 20% do not recover (Steinhausen, 2008). The high mortality rates of EDs, coupled with low full recovery rates, illustrate the importance of identifying variables that may predict better response to treatment.

**Defining Recovery and Remission**

Due to the presence of both psychological and physical symptoms in EDs, along with high rates of relapse (e.g. Khalsa et al., 2017), quantifying recovery and remission can be difficult. Beery et al. (2019) defined full psychological remission as absence of binge-purge behavior and EDI-3 risk subscale scores within one standard deviation (*SD*) of community norms

[2] This can also be conceptualized as the death rate among individuals with AN compared to the death rate among the general population; thus, the death rate among individuals with AN is 5.86 times higher than among the general population.

at the end of the six-month treatment period. Weight restoration was defined as attainment of at least 91% expected body weight (EBW; based on CDC charts) and a BMI over 19, as well as being within a dietician-assigned 5-pound goal weight range at the end of treatment. Participants were considered to be in partial remission when fully weight restored and not exhibiting binge-purge behavior but scoring more than 1 *SD* above community norms on the EDI-3 risk subscales. This is based on Bardone-Cone and colleagues' (2010) definition of recovery, which required clients to exhibit no binge eating, purging, or fasting for three months, display a normal BMI (i.e. $\geq$ 18.5), and score within 1 *SD* of community norms on all subscales of the Eating Disorder Examination-Questionnaire (EDE-Q; Fairburn & Bèglin, 1994). Partial recovery required clients to meet all the previous criteria except the EDE-Q requirements.

These criteria are largely consistent with other research in this area. Lock et al. (2010) defined psychological recovery as scoring within 1 *SD* of population norms on the EDE-Q and physical recovery as the attainment of at least 95% of expected body weight (EBW). Both %EBW and BMI are widely accepted measures of normalized weight. However, these measures are not foolproof; for example, they do not account for healthy individuals who are genetically below population norms in weight. To account for this imprecision, Beery et al. (2019) defined a 5-pound goal weight range for each client, recommended by a dietician in collaboration with each client's physician and based on clients' past weight and growth data. Based on the relative similarity of Beery and colleagues' criteria to those of previous researchers, the current study utilizes their definitions of weight restoration and psychological remission while noting that other studies' definitions may be slightly different or more stringent.[3]

[3] Consistent with Beery et al. (2019), the current study uses the term *psychological remission*. However, Beery and colleagues' definition of full psychological remission appears analogous to Bardone-Cone and colleagues' (2010) and Lock and colleagues' (2010) definitions of full psychological recovery.

## Family-Based Treatment

One treatment method that has proven effective is family-based treatment (FBT), which focuses on training parents to actively assist their child's treatment (Couturier et al., 2013; Lock & Le Grange, 2012). Parents first supervise meals until clients return to a healthy eating pattern and regain a healthy weight, after which they gradually return control of eating to the client. Lock et al. (2010) found that full remission rates were not significantly different for FBT and adolescent-focused individual therapy immediately following treatment conclusion; however, at 6 and 12 months after treatment, full remission rates were higher for those treated with FBT. This is supported by the results of a meta-analysis by Couturier et al. (2013), who found that while FBT did not appear superior to individual treatments immediately after treatment, follow-up procedures at 6 and 12 months after treatment revealed that FBT was actually more successful than other treatments over the long term.

FBT treatment programs vary in length. Lock et al. (2005) found no significant differences in AN treatment success between a 6-month, 10-session FBT program and a 12-month, 20-session FBT program. This suggests that shorter FBT program length may be sufficient for most ED clients. However, when clients showed obsessive-compulsive symptoms or had nonintact families, longer treatment was significantly more successful than shorter treatment. This illustrates the importance of accounting for comorbid diagnoses of other psychological disorders or symptoms and family situation when selecting optimal treatment for ED clients, as clients with more severe problems may require longer-lasting treatment.

## Perfectionism

High perfectionism is a common feature in EDs. While there is some disagreement about the exact definition of this trait, most definitions include striving for high (sometimes unrealistic)

personal standards (Franco-Paredes et al., 2005). According to a literature review by Bardone-Cone et al. (2007), six studies using various versions of the EDI found participants with AN had higher perfectionism than healthy controls, and three studies found participants with BN had higher perfectionism than healthy controls. Additionally, perfectionism negatively predicts recovery from AN, and premorbid perfectionism may predict EDs (especially AN).

Because of its association with psychopathology and psychological distress, perfectionism is perceived as maladaptive in the psychological community. However, Bieling et al. (2004) suggest this focus on the maladaptive aspects of perfectionism may be too narrow-minded. Slade and Owens (1998) distinguish between an adaptive model of perfectionism, in which perfectionistic behavior (i.e. striving for high standards) leads to rewards, and a maladaptive model of perfectionism, in which fear of failure or being perceived negatively by others leads to negative behaviors such as procrastination, etc. Consistent with this, Bieling et al. (2004) found that although both adaptive and maladaptive aspects of perfectionism were positively correlated with depressive and anxious psychopathology, maladaptive aspects were more strongly correlated. Additionally, maladaptive perfectionism predicted psychopathology, whereas adaptive perfectionism did not. These results suggest that striving for high standards is not necessarily harmful, whereas fear of failure is more closely connected with negative outcomes.

Some preliminary research suggests that FBT can reduce perfectionism in ED clients. Hurst and Zimmer-Gembeck (2015) conducted a preliminary case study on three participants, augmenting FBT with cognitive behavioral therapy designed to identify and reduce perfectionistic thinking. While only one participant fully recovered (defined as reaching 95% EBW for their age and height), all three participants showed substantial improvement in ED

symptoms and indicated the cognitive therapy was effective in helping them reduce perfectionistic thinking. The small sample size of this study makes it impossible to draw any concrete conclusions, but the participants' self-reports of the efficacy of cognitive therapy to reduce perfectionistic thinking suggest that perfectionism is an important factor in ED psychopathology and should be considered in treatment.

**Known Predictors of Treatment Success**

Several factors have been shown to predict treatment success and likelihood of full and/or sustained recovery. Depression is a common comorbid diagnosis and increases ED severity while decreasing treatment efficacy (Anderson et al., 2004). Franko et al. (2018) found, in a follow-up survey of ED clients conducted 20–25 years after end of treatment (EOT), that a comorbid diagnosis of major depressive disorder during treatment strongly predicted the likelihood of being diagnosed with AN-R 22 years later. Zerwas et al. (2013) found that self-induced vomiting and trait anxiety predicted lower likelihood of AN recovery. They also found that impulsivity predicted greater likelihood of recovery from AN; however, Agüera et al. (2017) found that higher novelty seeking scores predicted dropout and lack of full remission (for both sexes). Finally, Dingemans et al. (2016) found that higher self-esteem and low body dissatisfaction were associated with better outcomes, whereas interpersonal distrust (difficulty forming close relationships) was negatively associated with better outcomes.

**Parents and FBT**

Many studies examining FBT focus solely on the mother as a treatment administrator, and although some studies have taken paternal factors into account, fathers' impact on FBT has not been adequately examined. Singh et al. (2018) found that both clients and parents reported FBT as helpful. Client reports of treatment helpfulness were associated with relief of cognitive

symptoms, whereas maternal reports of treatment helpfulness were associated with client weight gain. Interestingly, paternal reports were not significantly associated with any treatment outcomes. Additionally, approximately two-thirds of parent responders were mothers. Finally, for those families where both parents assessed treatment efficacy (roughly 27% of families in the study), paternal and maternal reports were only moderately correlated. Many factors could account for this, but it may suggest low paternal involvement in treatment and certainly illustrates the need to examine both parents' perceptions of treatment efficacy. May et al. (2006) found that father-child relationships were linked to concerns about weight, such that rigid or confrontational paternal parenting styles were associated with higher ED risk. Furthermore, this relationship may be stronger for fathers than for mothers (Gale et al. 2013). This clearly illustrates the need for full paternal involvement in FBT.

**The Current Study**

The current study examined data from 20 participants diagnosed with AN, BN, or ENDOS who completed an adapted FBT program conducted by a private therapist (Beery et al., 2019). This treatment required both parents to attend all sessions, whereas most programs only require one parent to attend. Additionally, participants were given a specific 5-pound weight goal range, a feature unique to this program. To assess the client's symptoms, the Eating Disorder Symptom Questionnaire (SXQ; Beery et al, 2019) was administered independently to mothers, fathers, and clients at intake (T1), after four days (11 hours) of intensive FBT (T2), and after six months of FBT (T3). Additionally, the Eating Disorder Inventory-3 (EDI-3; Garner, 2004b) was administered to the clients at T1 and T3. Treatment resulted in full remission of both psychological and physical ED symptoms for 79% of clients and partial remission for a further 10% of clients, with only 10% retaining clinical levels of ED symptoms. The current study

aimed to identify potential links between the success of this adapted FBT program and variables such as perfectionism and concordance of parent-reported ED symptoms. Specifically, the current study addressed the following five research questions: (1) Does FBT decrease perfectionism? (2) Does perfectionism impact the success of FBT? (3) How closely correlated are maternal, paternal, and client ratings of ED symptoms? (4) Is parental agreement about ED symptoms related to recovery? (5) What factors most strongly predict recovery?

The results of Hurst and Zimmer-Gembeck (2015) suggest that perfectionism is a contributing factor in ED psychopathology, which suggests that lower perfectionism should be positively correlated with treatment success. However, S. H. Beery (personal communication, August 21, 2019) suggests that giving ED clients a specific weight goal may redirect perfectionistic tendencies toward attaining that weight. If this hypothesis is correct, perfectionism may be positively associated with recovery. Because of this inconsistent research, no specific predictions are made concerning the relationship between perfectionism and recovery. Concordance of parent-reported ED symptoms is hypothesized to be positively associated with recovery, based on Lock and colleagues' (2005) finding that clients from nonintact families benefited from longer treatment, which may indicate that parental agreement during FBT contributes to recovery. Finally, exploratory analyses examining other potential predictors of recovery may yield additional findings. Possible predictors include presence and number of comorbid diagnoses, self-induced vomiting (i.e. EDI bulimia), body dissatisfaction, interpersonal distrust, and self-esteem (Agüera, 2017; Dingemans, 2016; Zerwas, 2013).

This study hopes to add to the literature on FBTs for EDs by further exploring the high treatment success rate of the adapted FBT protocol conducted by Beery et al. (2019). This protocol's 6-month full remission rate of 79% appears to be a substantial improvement over

Lock and colleagues' (2010) reported 6-month FBT recovery rate of 40% and may represent a significant advancement in ED treatment. It is important to note that remission/recovery criteria used by Bardone-Cone et al. (2010), Lock et al. (2010), and Beery et al. (2019) are not identical. However, all require a normalized body weight and scores within one standard deviation of general population norms on ED risk scales; thus, remission/recovery criteria appear relatively comparable. In light of this, understanding what factors impact the effectiveness of this new adapted FBT model is vital to determining the best methods of applying this treatment on a larger scale.

## Method

### Participants

Participants were 25 females aged 12 to 28 years ($M$ = 15.58, $SD$ = 3.59) admitted to an adapted clinical family-based ED treatment program developed by Ellen Davis (Beery et al., 2019). Thirteen participants were diagnosed with AN-R, five with ENDOS, one with AN-BP, and one with BN (see Table 1). The remaining five participants dropped out before the end of treatment, and their data were excluded from analysis.[4] The mean number of comorbid diagnoses among all 25 participants at the start of treatment was 0.60 ($SD$ = 0.58).

### Materials

#### *Demographic Data*

Demographic data included participants' age, BMI, and %EBW. %EBW was calculated from the 50$^{th}$ percentile BMI for each participant's gender, age, and height using CDC growth

[4] With one exception: dropouts' data were not excluded from correlations between client, mother, and father SXQ reports during initial analyses. These analyses could not be run again with dropouts' data excluded due to lab closure (see Limitations section for further discussion).

charts. (Beery et al., 2019). Data analysis was approved by the Lycoming College IRB (IRB application number: 394_2017).

### *Eating Disorder Inventory-3*

The Eating Disorder Inventory-3 (EDI-3; Garner, 2004b) is a 91-item scale designed to measure ED psychopathology. Items consist of statements related to ED cognitions and behaviors (e.g. "I think that my stomach is too big," "I am terrified of gaining weight," etc.). Participants are asked to rate how often the statement is true about them on a 6-point scale, with response options ranging from (*always*) to (*never*). The ED contains 12 subscales. Three of these (drive for thinness, bulimia, and body dissatisfaction) are used to calculate the participant's overall ED risk score. The remaining nine psychological subscales examine different elements of ED psychopathology, such as perfectionism, interpersonal alienation, and interpersonal insecurity. Clausen et al. (2011) found the Cronbach's alphas for the various subscales of the EDI-3 ranged from .75 to .92, indicating acceptable to high internal consistency.

The interpersonal alienation and interpersonal insecurity subscales are of interest. Interpersonal alienation refers to low levels of trust and feelings of love and understanding in relationships—in other words, inability or difficulty forming healthy relationships. Interpersonal insecurity refers to poor expression of thoughts and feelings in relationships, along with withdrawal from relationships or social situations (Garner, 2004a).

### *Eating Disorder Symptom Questionnaire*

The Eating Disorder Symptom Questionnaire (SXQ; Beery et al., 2019) was developed by clinician Ellen Davis to allow both clients and their parents to rate ED symptoms. It consists of 24 items examining various ED cognitions and behaviors (e.g. "obsessive thinking about food and weight," "poor body image," etc.). Parents and clients independently rated how strongly

each item applies to the client on a 5-point scale, from 1 (*least*) to 5 (*most*). Beery et al. (2019) found the Cronbach's alphas for the SXQ to be between .82–.88 for clients, .77–.88 for fathers, and .71–.95 for mothers, indicating acceptable internal consistency (see Appendix A).

**Statistical Analyses**

All statistical analyses were conducted using IBM SPSS Statistics 25. Change in SXQ perfectionism scores from T1 to T3 was assessed using a paired-samples t-test. Differences in SXQ perfectionism scores between recovered and non-recovered clients were assessed using an independent-samples t-test. Correlations between EDI and SXQ perfectionism scores for T1 and T3 were examined using Pearson's product-moment correlations. Due to uncertainty as to whether client self-reported perfectionism or a composite of client self-reported, maternal-reported, and paternal-reported SXQ perfectionism measured the trait more accurately, correlations between EDI perfectionism and both client SXQ self-reported perfectionism and composite SXQ perfectionism were examined at T1 and T3.

Total client, maternal, and paternal SXQ scores were correlated at T1, T2, and T3 using Pearson's product-moment correlations. Concordance of maternal and paternal reports of client's ED symptomatology (i.e. parental agreement about symptom severity) at T1, T2, and T3 was quantified by subtracting total paternal SXQ scores from total maternal SXQ scores and taking the absolute value of the difference (therefore a smaller value for parental concordance corresponds to more similar maternal and paternal SXQ scores). These scores (at each of the three time points) were then correlated with change in BMI, change in %EBW, and change in EDI composite ED risk using Pearson's product-moment correlations.

All EDI risk and psychological subscales (as measured at T1), along with duration of illness, parental marital status, number of treatment sessions attended, and number and type of

comorbid diagnoses, were entered into stepwise regression equations to predict change in BMI, change in %EBW, and change in EDI composite ED risk.

## Results

### Perfectionism

Results of a paired-samples t-test showed that SXQ total perfectionism (averaged scores of client and both parents) significantly decreased from T1 to T3, $t(15) = 5.76$, $p < .001$ (see Figure 1). Results of independent-samples t-tests showed that recovered participants did not significantly differ from non-recovered participants on SXQ perfectionism at T1, $t(20) = -0.10$, $p = .92$, or T3, $t(15) = -1.24$, $p = .23$ (see Figure 2).

Results of Pearson's product-moment correlations showed that client SXQ self-reported perfectionism and composite SXQ perfectionism were significantly correlated with each other at T1 ($r = .82$, $p < .001$) and T3 ($r = .79$, $p < .001$). At T1, EDI perfectionism was not significantly correlated with client SXQ perfectionism ($r = .18$, $p = .41$) or composite SXQ perfectionism ($r = .26$, $p = .25$). However, at T3, EDI perfectionism was significantly correlated with client SXQ perfectionism ($r = .85$, $p < .001$) and composite SXQ perfectionism ($r = .86$, $p < .001$).

### Concordance of Client, Maternal, and Paternal SXQ Scores

#### *Within-Subjects Correlations*

Results of Pearson's product-moment correlations showed that client-self-reported SXQ total scores at T1 were significantly correlated with client scores at T2 ($r = .67$, $p < .001$). Similarly, client scores at T2 were significantly correlated with scores at T3 ($r = .49$, $p = .03$). However, client scores at T1 were not significantly correlated with scores at T3 ($r = .44$, $p = .06$).[5] Maternally reported SXQ total scores at T1 were statistically significantly correlated with

[5] This is expected, since total SXQ scores should decrease as recovery progresses (see Table 2).

maternally reported scores at T2 ($r$ = .43, $p$ = .04) and T3 ($r$ = .67, $p$ = .001). However, maternally reported scores at T2 were not significantly correlated with maternally reported scores at T3 ($r$ = .06, $p$ = .79). Total paternally reported scores at T1, T2, and T3 were not significantly correlated with each other (see Table 3, Table 4).

### *Between-Subjects Correlations*

Results of Pearson's product-moment correlations showed that client self-report, maternally reported, and paternally reported SXQ scores were not significantly correlated at T1. At T2, client self-reported scores were significantly correlated with maternally reported scores ($r$ = .47, $p$ = .02) and paternal reported scores ($r$ = .54, $p$ = .007). Additionally, maternally reported scores were significantly correlated with paternally reported scores ($r$ = .52, $p$ = .009). At T3, maternally reported scores were significantly correlated with client self-report scores, ($r$ = .65, $p$ = .003) and paternally reported scores ($r$ = .82, $p$ < .001). Client self-reported scores were not significantly correlated with paternally reported scores ($r$ = .45, $p$ = .07). However, as this statistic is approaching significance, the lack of a statistically significant relationship is likely an artifact of small sample size and low statistical power (see Table 3, Table 4).

## Relationship between Maternal-Paternal SXQ Concordance and Recovery

### *Weight Recovery*

Results of Pearson's product-moment correlations showed that change in BMI was significantly correlated with change in %EBW ($r$ = .99, $p$ < .001). Results of Pearson's product-moment correlations showed that maternal-paternal SXQ concordance at T1 was not statistically significantly correlated with change in %EBW ($r$ = -.05, $p$ = .86). Similarly, maternal-paternal SXQ concordance at T2 was not statistically significantly correlated with change in %EBW ($r$ =

.38, $p$ = .11) (although, once again, the correlation approaches significance).[6] However, maternal-paternal SXQ concordance at T3 was significantly negatively correlated with change in BMI ($r$ = -.52, $p$ = .03) and change in %EBW ($r$ = -.50, $p$ = .03).[7]

### *Psychological Recovery*

Results of Pearson's product-moment correlations showed that change in EDI composite ED risk was not statistically significantly correlated with maternal-paternal SXQ concordance at T1 ($r$ = -.10, $p$ = .71), T2 ($r$ = .26, $p$ = .32), or T3 ($r$ = .16, $p$ = .54).

## Predictors of Weight Restoration and Psychological Remission

Using a stepwise regression model, interpersonal alienation at T1 explained 39.3% of the variance in change in BMI, β = -.63, $p$ = .005. Adding number of treatment sessions explained an additional 15.7% of the variance in change in BMI, β = .40, $p$ = .04. Using a stepwise regression model, interpersonal alienation at T1 explained 39.7% of the variance in change in %EBW, β = -.63, $p$ = .007. Using a stepwise regression model, interpersonal insecurity at T1 explained 27.4% of the variance in change in EDI composite ED risk, β = .52, $p$ = .03.

# Discussion

## Summary of Findings

Perfectionism (as measured on the SXQ) significantly decreased from T1 to T3. Recovered participants did not significantly differ from non-recovered participants on perfectionism (as measured by the SXQ) at T1. Parental disagreement about ED severity at T3 was significantly negatively correlated with weight gain, as measured by change in BMI and %EBW (in other words, agreement was positively correlated with weight gain). EDI-3

[6] Correlations between change in BMI and maternal-paternal SXQ concordance at T1 and T2 were not conducted due to lab closure (see Limitations section for further discussion).

[7] This indicates that higher parental concordance was associated with greater weight gain; larger values for parental concordance indicate less agreement over symptom severity.

interpersonal alienation at T1 predicted less weight gain, as measured by change in BMI. Number of treatment sessions predicted more weight gain, as measured by change in BMI. EDI-3 interpersonal insecurity at T1 predicted better psychological recovery.

**Perfectionism**

Although EDI perfectionism and SXQ perfectionism were significantly correlated at T3, they were not significantly correlated at T1. Since the EDI-3 has good psychometric properties (Beery et al., 2019; Clausen et al., 2011), this finding indicates the validity of the SXQ's measure of perfectionism may need to be reexamined. Notably, the SXQ assesses perfectionism with only one item; specifically, participants are asked to rank the client's perfectionism on a 5-point Likert-type scale. In contrast, the EDI-3 uses six items to assess level of perfectionistic standards. Three of the items measure "personal perfectionistic standards" (i.e. the level to which clients hold themselves to high standards), and three measure "parental perfectionistic standards" (i.e. the degree to which clients feel held to high standards by their parents and/or teachers) (Garner, 2004a). The EDI-3's more complex assessment of perfectionism may suggest that it measures the trait more accurately than the SXQ. Another potential explanation is that perceived perfectionism and actual perfectionism are not necessarily correlated. The SXQ explicitly asks participants and parents to rate perceived perfectionism, whereas the EDI-3 assesses perfectionistic behavior and cognitions. The lack of correlation between SXQ and EDI perfectionism may reflect a discrepancy between these two constructs.

The current study found that SXQ perfectionism significantly decreased from T1 to T3, whereas Beery et al. (2019) did not find a significant decrease in EDI perfectionism from T1 to T3. This may indicate that, while clients and parents perceive perfectionism as decreasing after treatment, the actual perfectionistic tendencies do persist. Notably, the decrease in self-reported

SXQ perfectionism from T1 to T3 is consistent with Hurst and Zimmer-Gembeck's (2015) finding that participants self-reported decreases in perfectionistic thinking. This appears to offer some support for S. H. Beery's hypothesis that perfectionistic tendencies, while not eliminated by FBT, can be redirected toward healthy goals by giving clients a specific healthy weight goal (personal communication, August 21, 2019). More research should be done on this subject.

This lack of change in perfectionism is consistent with some previous research. In a literature review, Bardone-Cone et al. (2007) found that recovered AN or BN clients generally do not differ significantly from non-recovered clients in either adaptive or maladaptive perfectionism levels. Based on this, the most likely explanation of the decrease in SXQ perfectionism from T1 to T3 is that parents and clients may have perceived perfectionism as decreasing; however, the relatively stable EDI scores from T1 to T3 suggest that the trait persists after treatment and recovery.

The current study's finding that recovered and non-recovered clients did not differ on perfectionism scores is somewhat inconsistent with previous research. Santonastaso et al. (1999) found that, in a sample of mixed ED individuals (i.e. including various different ED diagnoses) who were not in treatment, those who had lower perfectionism scores at baseline were more likely to be in remission a year later, whereas those with higher perfectionism at baseline were more likely to retain ED symptoms. When specific diagnoses are considered, this effect appears to be more pronounced for AN than BN. For example, Mussell et al. (2000) found that perfectionism predicted neither treatment dropout nor recovery for BN clients undergoing cognitive-behavioral group therapy, whereas for AN clients, Sutandar-Pinnock et al. (2003) found that high perfectionism at baseline was correlated with dropout from inpatient treatment, and Bizeul et al. (2001) found high perfectionism was correlated with lower likelihood of

recovery 5–10 years after treatment intake. These findings highlight the complex nature of perfectionism and its role in EDs.

**Maternal-Paternal Concordance**

Maternal-paternal SXQ concordance was only significantly correlated with change in weight (both BMI and %EBW) at T3, which means clients whose parents' ratings of ED symptomology were more similar at T3 gained more weight. There are at least two potential explanations for this. Greater weight gain may increase parents' agreement, or parents' agreement on ED severity may encourage weight gain. The first explanation—that witnessing successful FBT results simply "gets parents on the same page"—is not useful in determining methods of increasing the efficacy of FBT. However, the theory that parental agreement can improve client results could, if accurate, potentially lead to significant improvement in clinical FBT practice.

A case study of an ED client conducted by Treasure et al. (2019) may offer support for this latter theory. Treasure et al. found that their client's father was disengaged and did not address her ED (2019). In contrast, the mother enabled the client's behavior by not contesting her unhealthy eating habits. Treasure et al. suggest that this inconsistent method of dealing with ED symptoms perpetuates the disorder. Additionally, paternal disengagement may place additional stress on the mother, which in turn may lead to less enforcement of calorie intake at meals (S. H. Beery, personal communication, April 16, 2020). Treasure et al. also suggest that inconsistent parental response to ED symptomatology can lessen the amount of social support clients obtain from parents, which further exacerbates symptoms (2019). This is consistent with research on parental dynamics in general. According to Steinberg et al. (2001), the best parental style is one which balances warmth and consistent discipline (authoritative parenting style).

Children who have even one authoritative parent generally have better psychological outcomes than children who do not have any authoritative parents. However, outcomes are even better (if only slightly) for children whose parents both have an authoritative style (Steinberg et al., 2001). It is likely that the same principles may apply for children with ED symptomatology—and the difference may be more significant when psychopathology becomes a factor. Additionally, Gale et al. (2013) suggest that father-client dynamics are extremely important in understanding and treating EDs, particularly when communication between the father and daughter is an issue. Ultimately, while the current study's findings do not clearly demonstrate any causal effects of parental involvement in FBT, they are a clear indication that research on FBT treatment should examine the roles of both parents in treatment.

**Interpersonal Alienation/Interpersonal Insecurity**

Contrary to the hypothesis, EDI perfectionism did not significantly predict physical recovery (as measured by change in BMI and change in %EBW) or psychological remission after controlling for duration of illness, parental marital status, number of treatment sessions attended, number and type of comorbid diagnoses, and other EDI psychological subscales. Interpersonal alienation emerged as the most significant predictor of both change in BMI and change in %EBW, such that higher interpersonal alienation predicted less weight gain. Number of treatment sessions also predicted change in BMI, such that greater number of treatment sessions attended predicted greater weight gain. Interpersonal insecurity emerged as the most significant predictor of change in EDI ED risk. Higher interpersonal insecurity predicted greater improvement in ED risk (i.e. more significant psychological recovery/remission).

The finding that higher interpersonal alienation predicted less significant physical recovery where higher interpersonal insecurity predicted more significant psychological recovery

appears counterintuitive. However, the two traits are not identical. Interpersonal alienation refers to difficulty forming healthy relationships, whereas interpersonal insecurity refers to poor expression of thoughts and feelings in relationships (Garner, 2004a). Given these differences between the two traits, one possible explanation is that ED clients high in interpersonal insecurity prior to treatment may respond particularly well to FBT, as its emphasis on the family as a whole may alleviate some of the insecurity felt by the client and increase their psychological improvements. In contrast, interpersonal alienation may prevent clients from experiencing the benefits of FBT, as clients who feel alienated from others may not respond as well to FBT's emphasis on rebuilding healthy familial relationships. This is consistent with Steinberg and colleagues' (2001) suggestion that lack of parental social support may exacerbate ED symptoms. Interpersonal alienation appears analogous to the interpersonal distrust subscale found in earlier versions of the EDI (e.g. EDI-II) due to its focus focus on lack of trust in relationships. Thus, Dingemans and colleagues' (2016) finding that interpersonal distrust predicted poorer recovery appears consistent with the current study's finding that interpersonal alienation predicted poorer physical recovery.

**Limitations and Future Directions**

The most significant limitation of the current study is that the statistical analyses are incomplete. Due to the 2020 COVID-19 pandemic, labs containing necessary statistical software were closed before all data could be analyzed. While correlations and t-tests for perfectionism and correlations for maternal-paternal concordance were completed satisfactorily, results for regressions predicting weight and psychological recovery represent preliminary and exploratory analyses. Linearity, homoscedasticity, normality, and other assumptions necessary to determine the appropriateness of the statistical tests were not assessed. Additionally, correlation matrices

include several correlations with an absolute value greater than .80, raising concerns about multicollinearity. Thus, results concerning predictors of weight restoration and psychological remission must be treated as preliminary. While these results may suggest avenues for further research, causal conclusions should not be drawn, as the accuracy of the tests cannot be determined.

Future research should complete the analyses begun in this study. Specifically, the following analyses should be conducted: (1) Multiple regression analyses predicting weight restoration and psychological recovery from EDI and SXQ perfectionism, (2) multiple regression analyses predicting weight restoration and psychological recovery from maternal-paternal SXQ concordance, and (3) stepwise regression analyses predicting weight restoration and psychological recovery from EDI psychological subscales. Special attention should be paid to interpersonal alienation and interpersonal insecurity, which emerged as significant predictors in the exploratory analyses conducted in the current study. Other EDI psychological subscales should be examined before being included in the model; the current study's analyses included all subscales, as their intent was not to develop a full regression model but rather to explore possible predictors which might be later entered into a more complete model.

Another limitation of the current study is that it examined a clinical population; thus, the results may not generalize to non-clinical populations (i.e. less severe ED cases). Additionally, no comparison or control groups were used, so direct comparison to other treatment methods is not possible. Future research should compare this adapted FBT program to a standard FBT program, as well as individual therapy, in order to more accurately and conclusively determine how weight recovery and psychological compare among these different treatment methods.

Additionally, studies should examine the utility of setting a 5-pound goal weight range for participants. The current study, along with previous research (e.g. Bardone-Cone et al., 2007), does not show clear support for the idea that FBT reduces perfectionism in ED clients. Nevertheless, perfectionism has been shown to be predictive of poor recovery, dropout, and relapse (e.g. Bizuel et al., 2001; Sutandar-Pinnock et al., 2003). The current study may support S. H. Beery's theory that setting a 5-point goal weight range redirects ED clients' perfectionistic tendencies away from being the "perfect anorexic/bulimic" to maintaining that healthy weight range. Such a finding could potentially be a major breakthrough in ED treatment. Many ED clients are terrified that treatment will "make them get fat," so providing them with a healthy stopping point for weight gain may allay this fear and make them more receptive to treatment. The current study represents a very preliminary inquiry into this tactic; future research should examine it in greater depth.

Finally, future studies should examine the roles of EDI interpersonal alienation and interpersonal insecurity in ED symptomatology. While EDI drive for thinness, bulimia, and body dissatisfaction are used to calculate overall ED risk, none of these variables at T1 significantly predicted weight gain or change in ED risk after controlling for other EDI variables. The surprisingly large variances in weight gain and change in ED risk predicted by EDI interpersonal alienation and interpersonal insecurity (respectively) suggest that these traits may be important factors that should be considered by clinicians. While concerns remain about the validity of these findings due to the premature termination of data analysis, these unexpected preliminary findings are statistically significant enough to warrant further investigation.

## Conclusions

The current study suggests the existence of a clinically significant relationship between client weight gain and parental agreement concerning their child's ED symptom severity. This finding is significant in light of the relatively low rates of paternal involvement in FBT programs. While causation cannot be inferred from this finding, the mere existence of any statistically significant relationship is a strong argument for increased emphasis on both maternal and paternal involvement in ED treatment; it is possible that parents who present a "united front" may encourage greater weight gain in their child. Additionally, the current study may support hypotheses advanced by S. H. Beery concerning the role of perfectionism in ED recovery. Given that perfectionism appears to be a relatively stable trait, providing participants with a 5-pound goal weight range may be a crucial element in recovery, as it presents clients with a healthy alternative goal for their perfectionistic striving. Finally, exploratory regressions suggest interpersonal variables are extremely important in predicting recovery. Overall, the results of the current study, while preliminary, may provide avenues for substantial improvement in ED treatment, which could potentially lead to dramatic improvements in ED recovery rates.

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Table 1

*Participant Characteristics*

| Demographics | Value (n = 20) |
|---|---|
| Age at T1 | |
| Minimum | 12 |
| Maximum | 28 |
| Mean (SD) | 15.58 (3.59) |
| Diagnosis at T1 | |
| AN-R | 13 |
| AN-BP | 1 |
| BN | 1 |
| EDNOS | 5 |

Table 2

*Means (M) and standard deviations (SD) for mean total SXQ responses at T1 (treatment intake), T2 (after one week of intensive FBT), and T3 (after six months of FBT) for clients, mothers, and fathers.*

| | M | SD | N |
|---|---|---|---|
| Time 1 | | | |
| Client report | 64.64 | 13.84 | 24 |
| Mother report | 70.19 | 10.76 | 24 |
| Father report | 69.24 | 13.93 | 24 |
| Time 2 | | | |
| Client report | 54.80 | 12.35 | 25 |
| Mother report | 63.05 | 14.32 | 24 |
| Father report | 61.55 | 10.48 | 24 |
| Time 3 | | | |
| Client report | 38.41 | 10.48 | 19 |
| Mother report | 44.06 | 15.80 | 20 |
| Father report | 41.90 | 11.18 | 19 |

Table 3

*Correlations between mean total SXQ responses at T1 (treatment intake), T2 (after one week of intensive FBT), and T3 (after six months of FBT) for clients, mothers, and fathers.*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Client report at T1 | - | | | | | | | | |
| 2. Client report at T2 | .67*** | - | | | | | | | |
| 3. Client report at T3 | .44 | .49* | - | | | | | | |
| 4. Mother report at T1 | .28 | .33 | .60** | - | | | | | |
| 5. Mother report at T2 | .40 | .47* | .40 | .43* | - | | | | |
| 6. Mother report at T3 | .23 | .29 | .65** | .67** | .06 | - | | | |
| 7. Father report at T1 | .30 | .14 | .27 | .25 | .15 | .15 | - | | |
| 8. Father report at T2 | .43* | .54** | .17 | .48* | .52** | .16 | .35 | - | |
| 9. Father report at T3 | .00 | -.09 | .45 | .36 | -.16 | .82*** | .09 | -.19 | - |

*Note.* * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4

*Correlations between mean total SXQ responses for clients, mothers, and fathers at each measurement time point.*

| | Client report | Mother report | Father report |
|---|---|---|---|
| Time 1 (intake) | | | |
| Client report | - | | |
| Mother report | .28 | - | |
| Father report | .30 | .25 | - |
| Time 2 (after 1 week of intensive FBT) | | | |
| Client report | - | | |
| Mother report | .47* | - | |
| Father report | .54** | .52** | - |
| Time 3 (after 6 months of FBT) | | | |
| Client report | - | | |
| Mother report | .65** | - | |
| Father report | .45 | .82*** | - |

*Note.* * $p < .05$, ** $p < .01$, *** $p < .001$.

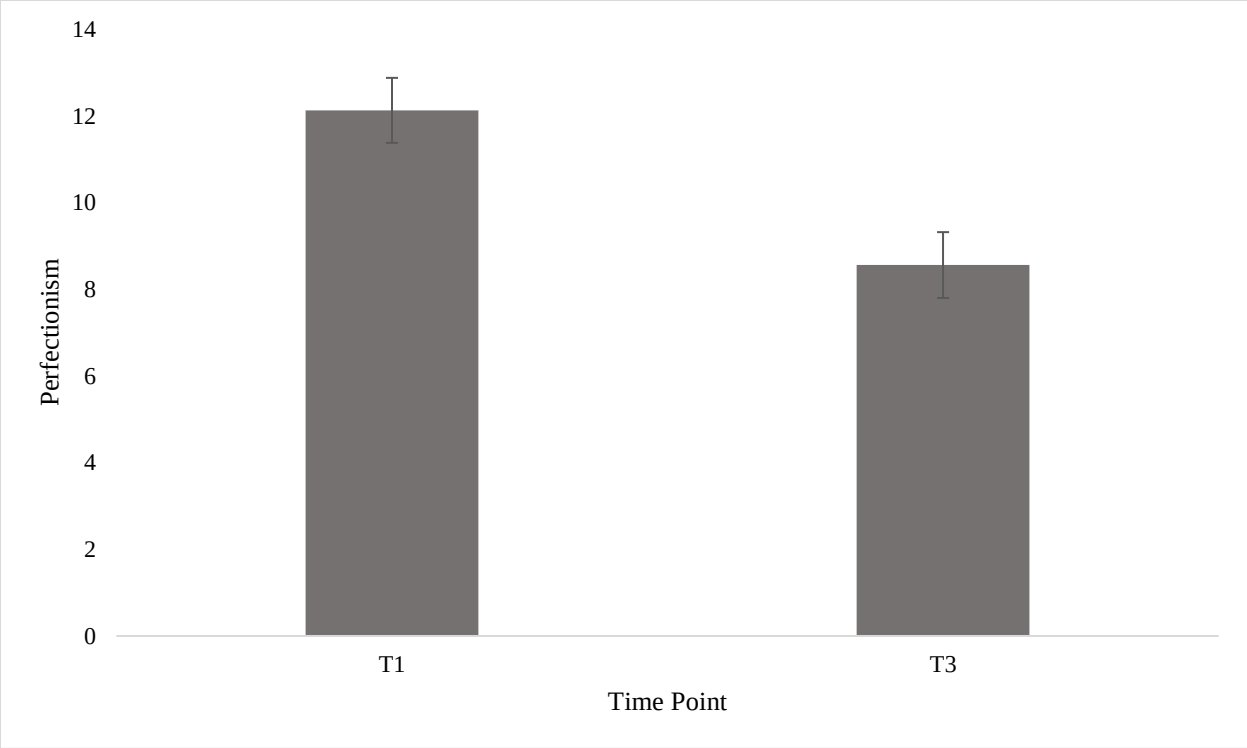


*Figure 1*. Perfectionism (as measured by the SXQ) significantly decreased from T1 to T3. Error bars represent standard error.

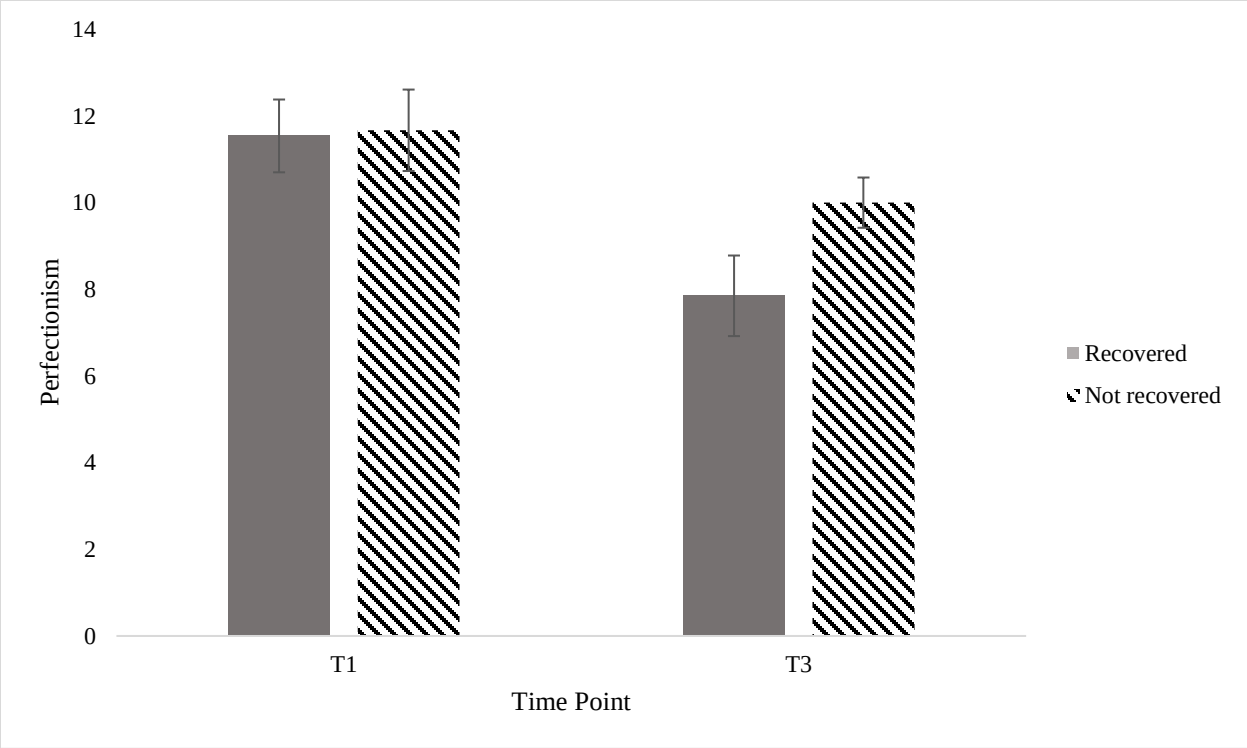


*Figure 2*. Recovered participants did not significantly differ from non-recovered participants on perfectionism (as measured by the SXQ) at T1 or T3. Error bars represent standard error.

Appendix A

Eating Disorder Symptom Questionnaire (SXQ)

**A. How much** [text obscured][8] **following at this point in time? Circle the number that best fits with 5 being the most severe and 1 the least intense symptom severity possible.**

| | **Item** | **Least** | | | | **Most** |
|---|---|---|---|---|---|---|
| 1 | lack of food variety | 1 | 2 | 3 | 4 | 5 |
| 2 | overall caloric restriction | 1 | 2 | 3 | 4 | 5 |
| 3 | over exercise | 1 | 2 | 3 | 4 | 5 |
| 4 | obsessive thinking about food or weight | 1 | 2 | 3 | 4 | 5 |
| 5 | Binging | 1 | 2 | 3 | 4 | 5 |
| 6 | purging or laxative use | 1 | 2 | 3 | 4 | 5 |
| 7 | irritable mood | 1 | 2 | 3 | 4 | 5 |
| 8 | sad or anxious mood | 1 | 2 | 3 | 4 | 5 |
| 9 | rigid thought patterns | 1 | 2 | 3 | 4 | 5 |
| 10 | poor peer relationships | 1 | 2 | 3 | 4 | 5 |
| 11 | social withdrawal | 1 | 2 | 3 | 4 | 5 |
| 12 | poor family relationships | 1 | 2 | 3 | 4 | 5 |
| 13 | inability to relax | 1 | 2 | 3 | 4 | 5 |
| 14 | perfectionism | 1 | 2 | 3 | 4 | 5 |
| 15 | fatigue | 1 | 2 | 3 | 4 | 5 |
| 16 | poor body image | 1 | 2 | 3 | 4 | 5 |
| 17 | poor concentration | 1 | 2 | 3 | 4 | 5 |
| 18 | mistrust of others | 1 | 2 | 3 | 4 | 5 |
| 19 | difficulty expressing thoughts/feelings | 1 | 2 | 3 | 4 | 5 |
| 20 | Tends to “zone out” during meals | 1 | 2 | 3 | 4 | 5 |
| 21 | Fears of certain foods – List: | 1 | 2 | 3 | 4 | 5 |
| 22 | Prolonged meal times | 1 | 2 | 3 | 4 | 5 |
| 23 | Food rituals – List: | 1 | 2 | 3 | 4 | 5 |
| 24 | High anxiety before, during, or after meals | 1 | 2 | 3 | 4 | 5 |
| 25 | Other: _____ | 1 | 2 | 3 | 4 | 5 |

[8] Due to the COVID-19 pandemic, the author was unable to obtain a blank copy of the SXQ. A de-identified photocopy of a participant’s responses was used instead; unfortunately, the de-identification process rendered some of the text illegible.

**B. How** [text obscured] **affecting your child's life on a daily basis? Please indicate below by making a mark at the appropriate place on the line.**

|----------|

0% 100%

**C. How motivated is your child to recover from the eating disorder? Please indicate below by making a mark at the appropriate place on the line.**

|----------|

0% 100%

**D. How motivated are you to help your child recover from the eating disorder? Please indicate below by making a mark at the appropriate place on the line.**

|----------|

0% 100%

**E. What change(s) would indicate that the program has had a positive impact on you? Please answer in the space below.**

**F. What change(s) would indicate that the program has had a positive impact on your child? Please answer in the space below.**

Dear Parent: Please fill in **all** [text obscured]

1. Patient Name _____
2. Current Date _____
3. Current Height _____
4. Current Weight _____
5. Is your daughter getting her menstrual cycle regularly? Please explain.

6. Since coming here for treatment, has your daughter needed further intensive treatment for her eating disorder, such as an outpatient or hospital program? If yes, please explain: