

ORIGINAL ARTICLE

Core eating disorder fears: Prevalence and differences in eating disorder fears across eating disorder diagnoses

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Abstract

Objective: Fear and anxiety are key maintaining factors for eating disorder (ED) pathology. Maladaptive fears lead to ED behaviors and avoidance, which provide temporary relief, but ultimately reinforce the fear and contribute to a cycle that maintains the ED. To date, fears of food and weight gain are the most explored fears underlying ED pathology. However, recently other important ED fears have been identified, including fears of social consequences and personal consequences.

Method: The current study ($N = 229$ individuals with an ED) aimed to better characterize ED fears. Specifically, this study examined which ED fears were most endorsed across and within ED diagnoses, and if there were differences in ED fears by diagnosis and by weight status.

Results: Overall, fear of gaining weight was the most frequently endorsed fear, followed by fear of food, and fear of judgment. Individuals with anorexia nervosa (AN) most frequently endorsed fear of food, individuals with atypical AN and bulimia nervosa: fear of gaining weight, and those with other specified feeding and eating disorder: fear of judgment. Limited differences were found between diagnoses. When examining by weight category, participants with underweight most frequently endorsed fear of food, participants with normal weight: fear of gaining weight, and participants with overweight and obesity: fear of judgment.

Discussion: These findings suggest ED fears are heterogeneous. Given such high heterogeneity, this work highlights the importance of assessing for specific ED fears at the beginning of treatment, which could be used to deliver personalized exposure treatment.

Public Significance Statement: Eating disorders (EDs) are serious mental illnesses with high rates of medical and psychiatric comorbidities. Fear plays an important role in the development and maintenance of EDs. The present study found fear of food, weight gain, and judgment are the most frequently endorsed fears for individuals with EDs and found few differences in fears based on ED diagnosis. These findings highlight the importance of assessing individuals' specific ED fears for treatment.

KEYWORDS

anxiety, eating disorder, fear

1 | INTRODUCTION

Eating disorders (EDs) have the second highest mortality rate of all mental illnesses, with 5%–7% mortality for those with anorexia nervosa (AN) and 2% mortality for those with bulimia nervosa (BN; Arcelus et al., 2011). The efficacy of treatments that are available and widely used (e.g., cognitive behavioral therapy for EDs [CBT-E]) is only 50% (van den Berg et al., 2019), and relapse rates across ED diagnoses are high (~35%–50%; McFarlane et al., 2008). Furthermore, there are no empirically supported evidence-based treatments for adults with AN. While CBT-E focuses on emotions broadly, less attention has been paid specifically to fear and co-occurring anxiety.

EDs frequently co-occur with anxiety disorders (>80% co-occurrence; Godart et al., 2000) and both fear and anxiety are key maintaining factors for ED pathology (Murray, Loeb, et al., 2016). Fear is an adaptive biological response to present or imminent danger; this danger can be real (e.g., charging bear) or perceived (e.g., nonpoisonous spider; Craske et al., 2009). However, within EDs, fear becomes maladaptive when it leads to engagement in behaviors and avoidance (e.g., restriction, purging) that are harmful both physically and psychologically (Murray et al., 2018). For example, fears of immediate weight gain can prevent individuals with an ED from intaking adequate calories, leading to medical (e.g., osteoporosis) and psychological (e.g., depression) consequences associated with restriction (Cass et al., 2020; Levinson et al., 2017; Wang et al., 2020). Ultimately, restriction may further reinforce anxiety, providing temporary relief from such fears, yet increasing maladaptive ED behaviors. Eventually, such behaviors and avoidance of anxiety can create a maladaptive cycle that perpetuates the ED, in a similar vein to maintenance of other anxiety disorders (Morrison & Heimberg, 2013; Robinaugh et al., 2019).

To date, literature suggests that two primary fears underly ED maintenance: fear of food (e.g., fear of certain foods; Steinglass et al., 2012) and fear of weight gain (e.g., weighing more than a specific number or rapidly gaining large amounts of weight; Levinson et al., 2019). For example, fear of food or weight gain may lead to the avoidance of certain feared foods (e.g., cake), engagement in over-exercise, or purging behaviors to compensate for eating. Over time, prolonged engagement in avoidance or compulsive behaviors (e.g., restriction, purging) to reduce anxiety around food or weight gain reinforces that these behaviors are necessary and that food and gaining weight should be feared. In addition, these behaviors and fears may generalize to other areas, such that increased avoidance (e.g., all sweets or purging after every meal) may occur. Ultimately this cycle creates a pattern of maladaptive behaviors that can be difficult to disrupt and maintains problematic ED behaviors, similar to the anxiety-avoidance cycle in the anxiety disorder literature (Kryptos, 2015; Stapinski et al., 2010).

Disruption of anxiety-avoidance cycles is most commonly addressed via exposure therapy wherein an individual is repeatedly exposed to the objects, situations, and thoughts that provoke anxiety (Craske et al., 2014). Most research on exposure-based treatments for

EDs focus on fear of food and more recently, fear of weight gain, since both of these fears are theorized to be central to ED pathology (Butler & Heimberg, 2020). In the ED field currently, it is often assumed that fear of food is the primary fear stimuli and that the feared outcome is weight gain (Murray, Loeb, et al., 2016). While this relationship may be true for some individuals with EDs, there are many possible combinations of ED fears and feared outcomes. For example, someone who fears food may be worried about uncomfortable physical sensations associated with fullness. Without knowledge of the specific feared stimuli and outcomes, exposure-based therapy will be ineffective or could reinforce the fear (Murray, Treanor, et al., 2016). For example, it has been proposed that if weight gain is the feared outcome, when patients with EDs are in a weight restoration phase and gain weight, the expectancy is reinforced (Murray, Treanor, et al., 2016). Alternatively, if the feared outcome is social rejection and the patient gains weight without rejection, their expectancy would be violated. To optimize exposure-based treatments it is imperative to target an individual's *specific* feared stimuli and feared outcome (Craske et al., 2014). Thus, it is important to have a robust understanding of the different types of ED fears to develop treatments to target the behavioral underpinnings appropriately.

It is well-known that ED symptoms are heterogenous (Carr & Grilo, 2020), therefore, it is likely that ED fears are also heterogenous, though this has not been well-explored. Beyond the fears identified in the CBT-E model (e.g., fear of weight gain and food; Steinglass et al., 2012), other domains of fears that have been implicated in the etiology and maintenance of EDs include social consequences (e.g., rejection), personal consequences (e.g., making mistakes), physical sensations (e.g., not tolerating your size), social eating (e.g., eating in public), and exercise-related fears (e.g., not being able to exercise), though these fears have been significantly less investigated (Levinson et al., 2019).

The present study aims to address critical gaps in the ED fear literature by examining which ED fears are most endorsed among individuals with AN, BN, atypical AN (A-AN), other specified feeding and eating disorder (OSFED), and binge-eating disorder (BED) and whether there are differences in ED fears across diagnoses. In addition, an exploratory examination of ED fears by weight status (i.e., underweight, normal weight, overweight, and obese) was conducted. Identification of more nuanced categories of ED fears would allow for the specification of treatment targets and guide the development of additional treatments for EDs. Ideally, this knowledge would improve treatment efficacy for EDs, as we know extinction learning is reduced when imprecise or inaccurate fears are targeted (Murray, Loeb, et al., 2016; Murray, Treanor, et al., 2016). In the present study, we hypothesized that (1) fear of food and weight gain would be highly prevalent, but that other fears would also be prevalent, (2) fears would be heterogenous, and (3) the heterogeneity of fears would not vary by diagnosis. Given the dearth of research on the relationship between weight status and ED fears, there were no *a priori* hypotheses for the examination of ED fears by weight status.

2 | METHODS

2.1 | Participants

Participants were 229 individuals with an ED diagnosis participating in an online trial of imaginal exposure for EDs. Participants were recruited worldwide through online advertisements (e.g., Instagram and Twitter) and fliers distributed by ED clinics. Participants were located across the United States and in Canada, Australia, New Zealand, the United Kingdom, South Africa, and Japan. The majority of participants were women ($n = 217$; 94.8%) and White ($n = 172$; 75.1%; see additional demographic characteristics in Table 1). Ages ranged from 15 to 66 ($M = 29.24$, $SD = 10.25$). The majority of participants were in the normal BMI category ($n = 95$; 42.8%); there were 63 participants (28.4%) in the underweight category and 64 (28.8%) in the overweight and obese category. Inclusion criteria were presence of an ED diagnosis and an ED-related fear. Participants were diagnosed using the *Structured Clinical Interview for DSM-5 Eating Disorder Module* (SCID; First et al., 2015). Diagnoses included, AN ($n = 72$; 31.4%), A-AN ($n = 69$; 30.5%), BN ($n = 57$; 24.3%), and OSFED/BED ($n = 31$; 13.7%). A-AN was included as its own diagnostic category because there were sufficient individuals ($n = 69$) to meaningfully compare this diagnostic group to the other diagnostic groups. The OSFED/BED group included individuals with BED, atypical BED, and avoidant/restrictive food intake disorder (ARFID). These diagnoses were grouped together because of their small sample sizes. Exclusion criteria were evaluated using the *Mini-International Neuropsychiatric Interview 5.0* (MINI;

Sheehan, 1998). Exclusion criteria included suicidal intent, current mania, and current psychosis. Comorbid psychiatric diagnoses based on self-report clinical cut-off scores are reported in Table 2.

2.2 | Procedure

Highly trained interviewers (PhD, MA, or BA) conducted structured clinical interviews at baseline (i.e., before treatment had begun) via telephone. Diagnoses were double-checked by four independent raters and overall, there was diagnostic agreement on 93% of cases. The other 7% of cases were re-reviewed by the principal investigator to reach consensus. In addition to the SCID and MINI, participants completed the *Eating Disorder Fear Interview* (EFI; see below; Levinson et al., 2019) at baseline, which is a structured clinical interview that assesses ED fear occurrence and intensity. This study was a single site study conducted through the University of Louisville. Procedures involving human subjects were approved by the University of Louisville IRB (Protocol #16.0771) and informed consent was obtained from all participants. The clinical trials registration for this study is NCT03712748. For further procedural information see Levinson et al. (2020).

2.3 | Measures

EFI (Levinson et al., 2019) is a 31-item structured clinical interview that assesses ED fear occurrence and intensity. For each fear, the interviewer asks the participant whether they hold that fear (Yes or No), to rate it on a scale of 1 (No Fear at All) to 10 (The Worst Fear Possibly Imagined), and to indicate their top three fears. This provides two indices: the overall specific top three ED fears and six subscales of composite fear rating. These six subscales are: fear of food, fear of weight gain, fear of personal consequences (i.e., losing control), fear of social consequences (i.e., rejection), exercise-related fears, and fear of discomfort (i.e., feeling physically uncomfortable). The EFI has good to excellent internal consistency for all subscales ($\alpha s .74-.90$) and factor, convergent, divergent, incremental, and construct validity (see

TABLE 1 Demographic characteristics of the sample

Demographic	<i>n</i>	%
Race/ethnicity		
White	172	75.1%
Hispanic	11	4.8%
Asian American	5	2.2%
Multiracial	5	2.2%
Black	3	1.3%
Not listed	2	0.9%
Not reported	31	13.5%
Sex		
Women	217	94.8%
Men	9	3.9%
Other	3	1.3%
Education		
Less than high school	6	2.6%
High school graduate	11	4.8%
Some college	57	24.9%
Associate's degree	11	4.8%
Bachelor's degree	72	31.4%
Master's degree	36	15.7%
Doctorate or professional degree	6	2.6%
Did not report	30	13.1%

TABLE 2 Comorbid mental disorders by self-report clinical cut-off

Self-report measure	Clinical cut-off	
	<i>n</i>	%
PSWQ	138	60.3
OCI-R	89	38.9
BDI-II	107	46.7
PCL-C	149	65.1
SPS	102	44.5

Abbreviations: BDI-II, Beck Depression Inventory II, clinical cut-off scores of moderate (20–28) and severe (29–63) combined based on Beck et al. (1996); OCI-R, Obsessive–Compulsive Inventory Revised, clinical cut-off score of 21 used based on Foa et al. (2002); PSWQ, Penn State Worry Questionnaire, clinical cut-off score of 62 used based on Behar et al. (2003); SPS, Social Phobia Scale, clinical cut-off score of 26 used based on Peters (2000).

Levinson et al., 2019). Internal consistency for all EFI subscales in the present study was good to excellent ($\alpha = .73-.89$).

2.4 | Data analysis

The present study is a secondary data analysis of data collected at baseline for an online trial. SPSS Statistics Version 27.0 was used for all analyses (IBM Corp, 2020). For analyses, ED fears were examined in three different ways. First, the raw frequencies of the top fears were examined. There was a total of 668 responses because everyone had three top fears. Second, these 668 top fears were categorized into the six EFI subscales; these are referred to as frequencies by ED fear subscales. A seventh category, “other,” was added to capture fears that did not fit into the pre-existing factor structure. Finally, the ratings for all 668 top fears were examined by subscale, which is the total score on each subscale.

A Pearson χ^2 was conducted to determine whether a difference was present in top ED fears endorsed by subscale between the four primary diagnoses. Pearson χ^2 were conducted between AN and A-AN, AN and BN, AN and OSFED/BED, A-AN and BN, A-AN and OSFED/BED, and BN and OSFED/BED. For χ^2 analyses, individuals with ARFID ($n = 4$) were removed from the OSFED/BED sample. These individuals were removed because the pathology of this disorder differs from the other disorders in the OSFED/BED sample (e.g., no binge eating; driven by fear of negative consequences of food intake). It is possible this difference in pathology would introduce heterogeneity into the OSFED/BED sample, and since the purpose of the χ^2 analyses was to understand differences between disorders, ARFID was excluded from this subgroup. For χ^2 , Cramer's V was used as a measure of effect size with 0.0–0.2 defined as small, 0.3–0.5 defined as medium, and 0.6–1.0 defined as large (Cohen, 1988; IBM Corp, n.d.).

A one-way multivariate analysis of variance (MANOVA) was run to determine the effect of individuals' ED diagnoses on the six EFI subscale scores and the seventh “other fear” category. Tukey HSD was used for post hoc tests. We did not compare the OSFED/BED category for the present analyses because there were not enough individuals in this category for adequate power. Preliminary assumptions were checked for the MANOVA and indicated all EFI subscale scores were normally distributed for AN, A-AN, and BN, as assessed by visual inspection of normal Q-Q

plots. There were no univariate or multivariate outliers, as assessed by boxplot and Mahalanobis distance ($p > .001$), respectively. There were linear relationships between the EFI subscales for each diagnosis, as assessed by scatterplot, and no multicollinearity, as assessed by Pearson correlation (all r s $> .315$ and $< .749$; all p s $< .001$; Table 3). Finally, there was homogeneity of variance–covariance matrices, as assessed by Box's M test ($p = .134$). See Supporting Information for the assumptions.

3 | RESULTS

3.1 | Frequency and descriptive statistics

3.1.1 | Top fears

Of the overall sample, fear of gaining weight ($n = 89$; 13.3%) was the most frequently endorsed top ED fear, followed by fear of food ($n = 72$; 10.8%), and fear of judgment ($n = 59$; 8.8%). These results support Hypothesis 1, that fear of food and weight gain would be highly prevalent but that other fears would also be prevalent. Participants with AN most frequently endorsed fear of food ($n = 32$; 15.2%). Participants with A-AN and BN most frequently endorsed fear of gaining weight ($n = 31$; 15.0%; $n = 26$; 16.3%; respectively), and those with OSFED/BED most frequently endorsed fear of judgment ($n = 10$; 11.0%). See Table 4 for full frequency results.

3.1.2 | Top fears via subscale

When examining frequencies by ED fear subscales, both the overall sample ($n = 230$ [34.4%]) and participants with AN ($n = 66$ [31.3%]), A-AN ($n = 66$ [32.0%]), BN ($n = 65$ [40.6%]), and OSFED/BED ($n = 33$, [36.3%]) most frequently endorsed fears of social consequences. See Table 5 for full frequency results. Of the six fear subscales, individuals with AN ($M = 7.46$, $SD = 2.57$), A-AN ($M = 7.91$, $SD = 1.95$), BN ($M = 8.36$, $SD = 1.90$), and OSFED/BED ($M = 6.94$, $SD = 2.59$) all had the highest average ratings for fear of weight gain. Both the frequency and descriptive findings support Hypothesis 2, that fears would be heterogenous. See Table 6 for full descriptive results.

TABLE 3 Zero order correlations for EFI subscales

EFI subscale	Fear of food	Fear of weight gain	Exercise-related fears	Physical sensations	Social consequences	Personal consequences
Fear of food	1	.628 ^a	.594 ^a	.621 ^a	.543 ^a	.644 ^a
Fear of weight gain	.628 ^a	1	.439 ^a	.644 ^a	.527 ^a	.549 ^a
Exercise-related fears	.594 ^a	.439 ^a	1	.411 ^a	.315 ^a	.457 ^a
Physical sensations	.621 ^a	.644 ^a	.411 ^a	1	.749 ^a	.671 ^a
Social consequences	.543 ^a	.527 ^a	.315 ^a	.749 ^a	1	.669 ^a
Personal consequences	.644 ^a	.549 ^a	.457 ^a	.671 ^a	.669 ^a	1

Abbreviation: EFI, Eating Disorder Fear Interview.

^aSignificant at the 0.01 level.

TABLE 4 Frequency of top eating disorder fears by diagnosis

ED fear	AN		Atypical AN		BN		OSFED		Overall	
	n	%	n	%	n	%	n	%	n	%
Gaining weight	23	10.9	31	15.0	26	16.3	9	9.9	89	13.3
Food-related fears	32	15.2	24	11.7	10	6.3	6	6.6	72	10.8
Judgment	12	5.7	16	7.8	21	13.1	10	11.0	59	8.8
Rejection	18	8.5	12	5.8	15	9.4	9	9.9	54	8.1
Losing control	19	9.0	17	8.3	8	5.0	5	5.5	49	7.3
Failing expectations	14	6.6	13	6.3	11	6.9	8	8.8	46	6.9
Weighing more than a specific number	16	7.6	12	5.8	9	5.6	7	7.7	44	6.6
Abandonment/loneliness	15	7.1	13	6.3	11	6.9	4	4.4	43	6.4
Not exercising	8	3.8	15	7.3	5	3.1	3	3.3	31	4.6
Judgment of self	6	2.8	7	3.4	6	3.8	6	6.6	25	3.7
Other fear	11	5.2	3	1.5	6	3.8	5	5.5	25	3.7
Not accepting body/tolerating size	8	3.8	4	1.9	6	3.8	5	5.5	23	3.4
Physical discomfort/fullness	6	2.8	7	3.4	3	1.9	4	4.4	20	3.0
Making mistakes	7	3.3	5	2.4	3	1.9	3	3.3	18	2.7
Emotional discomfort	5	2.4	4	1.9	5	3.1	2	2.2	16	2.4
Embarrassment	1	0.5	6	2.9	6	3.8	2	2.2	15	2.2
Being compared	4	1.9	5	2.4	3	1.9	1	1.1	13	1.9
Laziness	3	1.4	5	2.4	2	1.3	1	1.1	11	1.6
Failure	3	1.4	3	1.5	2	1.3	1	1.1	9	1.3
Others seeing body or seeing eat	0	0.0	4	1.9	2	1.3	0	0.0	6	0.9

Abbreviations: AN, anorexia nervosa; BN, bulimia nervosa; ED, eating disorder; OSFED, other specified feeding and eating disorder.

TABLE 5 Frequency of top eating disorder fear subscales by diagnosis

ED fear subscale	AN ^a		Atypical AN		BN ^a		OSFED ^a		Overall	
	n	%	n	%	n	%	n	%	n	%
Fear of social consequences	66	31.3	66	32.0	65	40.6	33	36.3	230	34.4
Fear of weight gain	39	18.5	43	20.9	35	21.9	16	17.6	133	19.9
Fear of physical sensations	26	12.3	28	13.6	26	16.3	19	20.9	99	14.8
Fear of personal consequences	29	13.7	27	13.1	13	8.1	9	9.9	78	11.7
Fear of food	32	15.2	24	11.7	10	6.3	6	6.6	72	10.8
Exercise-related fears	8	3.8	15	7.3	5	3.1	3	3.3	31	4.6
Other fears	11	5.2	3	1.5	6	3.8	5	5.5	25	3.7

Abbreviations: AN, anorexia nervosa; BN, bulimia nervosa; ED, eating disorder; OSFED, other specified feeding and eating disorder.

^aThere was a statistically significant difference between diagnosis of AN or BN and a diagnosis of AN or OSFED and the top ED fears endorsed by subscale.

3.1.3 | Top fears across BMI category

Participants with underweight most frequently endorsed fear of food ($n = 30$; 15.8%), participants with normal weight most frequently endorsed gaining weight ($n = 44$; 15.5%), and participants with overweight and obesity most frequently endorsed fear of judgment ($n = 24$; 12.8%). When examining EFI subscales, fear of social consequences was most frequently endorsed across BMI categories. See Tables 7 and 8 for full frequency results.

3.1.4 | Top ED fear differences by diagnosis

There was a statistically significant difference between diagnosis of AN or BN and the top ED fears endorsed by subscale, $\chi^2(6) = 13.25$, $p = .039$ and between diagnosis of AN or OSFED/ BED, $\chi^2(6) = 14.13$, $p = .03$. The effect size for both findings, Cramer's V, was small (.19 and .22, respectively). There were no statistically significant associations between any of the other ED diagnoses and the top ED fears endorsed by subscale, all $ps > .05$.

TABLE 6 Top eating disorder fear subscale descriptives

ED fear subscale	AN		Atypical AN		BN		OSFED	
	M	SD	M	SD	M	SD	M	SD
Fear of food	6.0	2.4	5.8	2.1	5.7	2.1	4.2	2.1
Fear of weight gain	7.5	2.6	7.9	2.0	8.4	1.9	6.9	2.6
Fear of personal consequences	6.6	2.5	7.0	2.0	6.7	2.2	5.7	2.4
Fear of social consequences	6.0	2.2	6.5	2.0	6.8	2.1	5.9	2.5
Exercise-related fears	5.6	2.8	6.1	2.6	6.0	2.8	4.0	2.3
Fear of physical sensations	6.6	2.4	7.2	1.8	7.1	1.9	6.3	2.4

Note: The scale for fear ratings ranged from 1 to 10.

Abbreviations: AN, anorexia nervosa; BN, bulimia nervosa; ED, eating disorder; M, mean; OSFED, other specified feeding and eating disorder; SD, standard deviation.

TABLE 7 Frequency of top eating disorder fears by weight category

ED fear	Underweight		Normal weight		Overweight	
	n	%	n	%	n	%
Gaining weight	24	12.6	44	15.5	20	10.6
Losing control	17	8.9	24	8.5	8	4.3
Judgment	10	5.3	25	8.8	24	12.8
Judgment of self	5	2.6	8	2.8	12	6.4
Rejection	16	8.4	18	6.3	19	10.1
Weighing more than a specific number	15	7.9	17	6.0	12	6.4
Food-related fears	30	15.8	31	10.9	10	5.3
Abandonment/loneliness	14	7.4	15	5.3	12	6.4
Failing expectations	13	6.8	16	5.6	17	9.0
Not exercising	9	4.7	17	6.0	5	2.7
Not accepting body/tolerating size	4	2.1	8	2.8	11	5.9
Embarrassment	2	1.1	6	2.1	7	3.7
Physical discomfort/fullness	4	2.1	9	3.2	7	3.7
Failure	3	1.6	5	1.8	1	0.5
Being compared	1	0.5	5	1.8	7	3.7
Emotional discomfort	5	2.6	6	2.1	5	2.7
Making mistakes	5	2.6	9	3.2	3	1.6
Laziness	1	0.5	9	3.2	1	0.5
Others seeing body or seeing eat	0	0.0	4	1.4	2	1.1
Other fear	12	0.6	8	2.8	5	2.7

Abbreviation: ED, eating disorder.

TABLE 8 Frequency of top eating disorder fear subscales by weight category

ED fear subscale	Underweight		Normal weight		Overweight	
	n	%	n	%	n	%
Fear of food	30	15.8	31	10.9	10	5.3
Fear of weight gain	39	20.5	61	21.5	32	17.0
Fear of personal consequences	23	12.1	42	14.8	12	6.4
Fear of social consequences	57	30.0	88	31.0	82	43.6
Exercise-related fears	9	4.7	17	6.0	5	2.7
Fear of physical sensations	20	10.5	37	13.0	42	22.3
Other fears	12	6.3	8	2.8	5	2.7

Abbreviation: ED, eating disorder.

Hypothesis 3 is partially supported by this finding as only two differences in diagnoses were found.

3.1.5 | Differences in EFI subscale score by diagnosis

Based on diagnosis, there was a significant difference between EFI subscale scores, Wilks' $\Lambda = .869$, $F(12, 360) = 2.182$, $p = .012$; partial $\eta^2 = .068$. However, separate univariate tests on the EFI subscale scores revealed nonsignificant differences between diagnoses, all $ps > .05$, supporting Hypothesis 3 that the heterogeneity of fears would not differ by diagnosis. This analysis did not change when including age as a covariate.

4 | DISCUSSION

In the present study, 31 specific ED fears were assessed in a sample of individuals with EDs. The primary goals of the study were to identify the top ED fears endorsed overall and by specific ED diagnosis. Ultimately, we aimed to quantify the breadth of ED fears and whether there were differences in top ED fears by ED diagnosis and weight status. Overall, 20 different top fears were endorsed across ED diagnoses, demonstrating high heterogeneity of ED fears. The top two overall most frequently endorsed fears were fear of weight gain and fear of food, which is in line with prior research and theory (Murray et al., 2018). However, fear of judgment, which is a less well-researched fear in the EDs, was highly endorsed as the third most frequently nominated fear. Overall, these data point to high heterogeneity of ED fears.

4.1 | Diagnostic differences

The only differences found between diagnoses was top ED fears endorsed by subscale for AN and BN and for AN and OSFED/BED, and these differences were small. It is possible that these differences were driven by fear of food (see Table 4). Thirty-two individuals with AN reported fear of food as one of their top fears, while only 10 individuals with BN and 6 with OSFED/BED reported this fear as one of their top fears. However, the lack of differences between A-AN, BN, and OSFED suggests ED fears operate similarly across diagnoses, and further supports that there is high heterogeneity within categorical diagnoses (Levinson et al., 2018). This finding suggests it is imperative to assess for precise symptoms and fears regardless of diagnosis. It is important to note that in the present study only current ED diagnoses were considered. Future research should examine how fears differ over time in individuals whose diagnosis changes (e.g., past AN and current BN).

When examining overall ED fears by diagnosis, fear of food was the most frequently endorsed fear by those with AN, fear of gaining weight by those with A-AN and BN, and fear of judgment by those with OSFED/BED. In the existing ED literature, fear of judgment has

only been examined in a few studies. Levinson and Williams (2020) used network analysis to examine ED fears in a large sample of undergraduates and identified fear of judgment due to weight gain as one of the most central ED fears. A recent case series examining exposure for binge eating in adolescents found that some participants endorsed fear of judgment as more related to their binge eating than fear of weight gain (Manasse et al., 2021). There is high comorbidity between EDs and anxiety disorders, and social anxiety disorder (SAD) is the most frequently diagnosed comorbid anxiety disorder in those with EDs (Levinson & Rodebaugh, 2012; Pallister & Waller, 2008; Schaumberg et al., 2019; Swinbourne et al., 2012). Furthermore, evidence suggests anxiety disorders commonly precede the onset of EDs (Schaumberg et al., 2019). In SAD, fears of scrutiny, social interaction, and negative evaluation are central to pathology (Mattick & Clarke, 1998). Research examining the comorbidity of SAD and EDs has shown fear of negative evaluation is associated with both drive for thinness and restraint (Levinson & Rodebaugh, 2012). The high comorbidity between EDs and SAD and the focus on fears of social evaluation in SAD, such as fears of eating in public or in front of others, are consistent with the finding that fears of judgment are a highly prevalent fear in EDs (Kerr-Gaffney et al., 2018). Prior literature and findings in the present study suggest fear of judgment should be further examined as a key fear in the EDs and that there are important ED fears to consider for treatment beyond fear of weight gain and food.

4.2 | Weight status

Different top fears were endorsed by each BMI category. Fear of food was most frequently reported for those in the underweight category, fear of gaining weight for those in the normal weight category, and fear of judgment for those in the overweight and obese category. This finding suggests that the type of ED fear endorsed may differ by weight category, but future studies need to examine this relationship statistically and longitudinal studies are needed to further explore this relationship. If these findings are replicated in prospective data, it is possible ED fears could change over the course of treatment and correspond to weight gain, which would mean multiple fears may need to be addressed at different points in treatment. For example, if someone entered exposure-based treatment at an underweight status and their primary fear was food, exposures would focus on food. However, once the individual reached normal weight, their primary fear may shift (e.g., to fear of weight gain), thus the target of exposure and the corresponding interventions would also need to shift. If fears do fluctuate with weight status, it is extremely important to assess fears throughout ED treatment because targeting the incorrect fear and feared outcome may lead to poor treatment outcomes (Murray, Treanor, et al., 2016). In addition, it is interesting to consider the impact diet culture may have on the difference in top fears endorsed by weight status in the current sample. For example, individuals in the normal weight category may receive messages that if they gain weight and enter the overweight or obese BMI category, they will be

unhealthy. Alternately, individuals in the overweight category may receive messages that their body size is unacceptable, therefore they might be more likely to fear rejection because of their weight status. It is important to note that the metric to determine weight status in the present study is BMI, which is inherently flawed and a poor indicator of health (Nuttall, 2015).

4.3 | Subscale fears

When examining top fears by subscale, fear of social consequences was the most frequently endorsed ED fear subscale overall and by all ED diagnoses. In the EFI, the fear of social consequences subscale includes items such as “I am afraid I will be criticized if I become overweight” and “I am afraid I will be judged on what I eat” (Levinson et al., 2019), emphasizing the social nature of these fears. This finding highlights the importance of investigating underlying *specific* ED fears and considering the social context around those fears. It also supports previous research which suggests altered processing during social interactions is a key feature of BN pathology and that individuals with AN have severe deficits in social cognitions (Luo et al., 2021; McAdams & Krawczyk, 2011). In addition, literature suggests that socioemotional and interpersonal components play a key role in the development and maintenance of EDs, especially AN (Treasure & Schmidt, 2013). For example, individuals with AN have been found to show attentional bias toward negative facial expressions (Harrison et al., 2010), and impairments in interpreting the emotions and intentions of others (e.g., interpreting body language; Oldershaw et al., 2011). In addition, negative social comparison (e.g., others are thinner than me) is common in individuals with EDs as well as a tendency toward submissive behaviors (e.g., avoiding eye contact; Treasure et al., 2012; Troop et al., 2003). Therefore, high endorsement of fear of social consequences is in line with this impairment in socioemotional and interpersonal facets.

Although the present study expands the existing literature on ED fears, it is not without limitations. First, the sample included mostly White women. However, since the ED fears were found to be heterogeneous even in this fairly homogenous group, it is likely these results would be replicated in a more diverse sample. Second, although there were approximately the same number of individuals in the AN, A-AN, and BN groups, there were fewer individuals in the OSFED/BED group. Future research should aim to include more individuals with OSFED, BED, and ARFID. Third, all individuals in this study were recruited for an online treatment study, which could have biased who enrolled in the study. Future studies should recruit a wider range of individuals (e.g., not treatment seeking) to make results more generalizable. Fourth, a subsample of individuals in the present study ($n = 129$) were used in the development and validation of the EFI (Levinson et al., 2019). However, none of the results reported in the present study were examined previously. Fifth, we did not collect formal diagnostic information on comorbid mental disorders and hope that future research will. Sixth, the present study lacked multimodal measures of fear. Future studies should incorporate additional

measures of fear, such as the Fear Learning and Anxiety Response (Purves et al., 2019) application to examine participant's performance on a fear conditioning paradigm. Finally, the present study did not assess fear stimuli and feared outcomes separately. For example, it is possible that social fears could be the feared negative outcome instead of the fear stimuli. Therefore, future studies should include an assessment of the differences between fear stimuli and feared outcomes and further examine the relationship between ED fears.

Most exposure treatments for EDs have focused on exposing individuals to feared food (Steinglass et al., 2012). While fear of food is common in individuals with EDs, the present study suggests there are additional fears and functions beyond fear of food. For example, someone might avoid food because they are worried they will be judged for eating, thus instead of targeting food the target should be fear of judgment. It is possible that fear of food exposures have been less efficacious than expected due to a lack of targeting the actual feared outcome of consuming food (e.g., judgment or weight gain). In addition, there is only one type of treatment for fear of weight gain—imaginal exposure (Levinson et al., 2020). In the present study, fear of weight gain was just as common, and in some instances more common (i.e., for A-AN and BN participants) than fear of food. Given this fear is as commonly endorsed as fear of food, there needs to be a focus on further exploring treatment options for fear of weight gain.

To target the specific ED fear for each individual, an assessment similar to the EFI could be conducted at the beginning of treatment, in which patients nominate their top fears and feared outcomes. Once the core ED fears for the individual have been identified, personalized exposure therapy can be delivered. Extensive research has been conducted on exposure therapy for the anxiety disorders, posttraumatic stress disorder, and obsessive-compulsive disorder and shows short- and long-term efficacy for the reduction of fear (Abramowitz, 2006; Foa et al., 1984, 2012), and preliminary ED literature has shown the efficacy of exposure therapy for reducing ED behaviors and cognitions (Levinson et al., 2020; Murray et al., 2018; Murray, Treanor, et al., 2016; Steinglass et al., 2012; Steinglass et al., 2014).

Another important implication of the present study is the need to examine EDs on a symptom level, instead of a categorical level (e.g., diagnoses). ED fears were highly heterogeneous both across and within ED diagnoses with 20 of the 31 possible fears nominated as a top fear. Therefore, even if individuals have the same diagnosis, it does not mean they have the same ED fears. Thorough personalized assessments could be used to assess individuals' primary symptoms, including their ED fears, at the beginning of treatment to guide treatment planning and exposure development (Fisher et al., 2019; Levinson et al., 2020). The present study is the first to address the heterogeneity of fears across and within the ED diagnoses. Overall, we found that fears of food, weight gain, judgment, and social consequences were the most frequently occurring fears. This research highlights the urgent need to further explore ED fears to better understand how EDs develop and are maintained. Future research should explore ED fears using advanced statistical approaches, such as latent profile analysis and network

analysis. Ultimately, identification of specific and precise ED fears could lead to personalized and efficacious treatments for EDs.

AUTHOR CONTRIBUTIONS

Mackenzie Brown: Conceptualization; formal analysis; methodology; writing – original draft. **Cheri Alicia Levinson:** Conceptualization; data curation; investigation; project administration; writing – review and editing.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

Data will be made available upon reasonable request.

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