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Eating-related anxiety in individuals with eating disorders

CM Webb¹, P Thuras², CB Peterson¹, J Lampert³, D Miller³, and SJ Crow¹

¹Department of Psychiatry, University of Minnesota, Minneapolis

²Minneapolis VA Medical Center, Minneapolis

³The Emily Program, St. Paul, MN, USA

Abstract

Although previous research has supported the importance of anxiety as an etiological and maintenance factor for eating disorders, the specific mechanisms are not well understood. The role of anxiety in the context of eating behavior is especially unclear. The purpose of this study was to identify anxiety-eliciting eating situations and anxiety management strategies patients use to mitigate anxiety experienced in the context of eating as determined by diagnostic groups and symptom patterns. Fifty-three eating disorder outpatients were administered the Eating and Anxiety Questionnaire (EAQ) and the Eating Disorder Diagnostic Scale. Ratings indicated significant anxiety in most eating situations, whereas management strategies were more limited yet regularly employed. Factor analysis of the EAQ revealed a 6-factor solution for anxiety management strategies and a 4-factor solution for anxiety-eliciting situations. These results indicate patients with eating disorders report high levels of anxiety associated with eating behaviors but utilize limited yet consistent anxiety management strategies. Effective intervention strategies for managing eating-related anxiety should be incorporated into treatment and may need to be specified for different diagnostic subgroups.

Keywords

Eating and anxiety questionnaire; eating disorder; eating context; anxiety management

Introduction

Anxiety is a widely acknowledged characteristic of eating disorders (ED). Numerous studies have documented high levels of comorbidity between ED and anxiety disorders (1-3). The exact nature of the relationship between anxiety and ED is unclear. Anxiety disorders may precede the onset of ED (4) and may contribute to their onset and maintenance (1). This high prevalence of anxiety disorders is consistently found across ED diagnostic categories. Although most research examining anxiety and ED has involved participants with anorexia nervosa (AN) and bulimia nervosa (BN), several studies also documented high rates of anxiety disorder diagnoses in patients with binge eating disorder (BED) (5, 6).

Although the comorbidity of anxiety disorders and ED has received much attention in the literature, anxiety as a trait of individuals with ED is not as well understood (7). Individuals without a lifetime anxiety disorder and who had recovered from an ED for at least 12 months continued to have significantly higher anxiety scores than healthy women (8). This study suggested that anxiety is a trait present in many persons with ED, even in the absence of an anxiety disorder meeting the Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition (DSM-IV) criteria (9). Given this finding, working toward a better understanding of the full spectrum of anxiety in ED beyond Axis I anxiety disorder diagnoses is necessary to better understand the relationship between anxiety and ED.

The importance of anxiety in ED is reflected in the diagnostic criteria and measures. Examples include criteria such as “morbid fear of becoming fat” and “marked distress with binge eating” (DSM-IV) (9), a “dread of fatness” (International Classification of Diseases-Tenth Edition, ICD-10) (10), as well as “fear of losing control,” “preoccupation with shape and weight,” “fear of weight gain,” and “discomfort seeing body” from Eating Disorder Examination (EDE) (11).

Although anxiety is included in ED criteria and measures and considerable research has been conducted to understand Axis I anxiety disorder comorbidity as well as biological factors (12), there is a surprising paucity of studies examining the subjective experience of anxiety in the context of eating behaviors. The role of anxiety in eating behaviors may be particularly important as a causal and maintenance factor as well as an important target of treatment. The purpose of this study was to identify anxiety experienced in the context of eating for individuals with ED including precipitants and management strategies. A secondary aim of this investigation was to identify differences in patterns of anxiety among ED diagnostic groups and symptom patterns.

Method

Participants

The 53 participants (52 female) ranged in age from 16 to 65 yr [mean (M) = 29.47, standard deviation (SD) = 11.45]. At the time of the study, all participants were enrolled in one of three ED outpatient treatment options: an intensive full-day, 6-day per week program (N=5), a flexible 4- to 5-session per week program (N=21), or individual psychotherapy (N=25) (not reported, N=2). The sample was comprised of 86.7% Caucasian, 5.7% Hispanic, 3.8% Asian, 1.9% Latina, and 1.9% South American participants. At the time of study participation, diagnoses included 1 participant with AN, 20 participants with BN, 6 participants with BED, and 26 with ED not otherwise specified (ED NOS).

Measures

Eating Disorder Diagnostic Scale (EDDS) (13)—The EDDS is a brief self-report measure designed to assign DSM-IV (9) diagnoses of AN, BN, and BED. The 22-item scale consists of Likert-scaled and yes/no items assessing fear of gaining weight, binge eating (BE) behaviors, and compensatory behaviors during the preceding 3 to 6 months. The EDDS has demonstrated content validity and criterion validity with interview diagnoses ($\kappa=0.83$) in

comparison to preexisting eating pathology measures (13). Results of further studies provide additional support for the criterion validity, convergent validity, and internal consistency of the EDDS (14).

Eating and Anxiety Questionnaire (EAQ)—This newly-developed 54-item Likert format questionnaire assesses two facets of anxiety in the context of eating. First, items assess anxiety management strategies individuals employ to mitigate anxiety experienced while eating. Example items from these sections include “In order to reduce my anxiety while I eat, I read while I eat” or “In order to reduce my anxiety while I eat, I eat alone.” Items were rated 1-5, “never” to “always.” Second, items address anxiety-eliciting eating situations. These questions identify which meals/snacks are the most anxiety-eliciting, as well as which eating situations are the most anxiety-eliciting (e.g., “Eating in front of people I don't know makes me most anxious”, “Eating when I don't have a time limit makes me most anxious”). Items were rated 1-5, “never” to “always”. A copy of the EAQ is available from the authors upon request.

Procedure

Written informed consent was obtained prior to participation. All participants were administered the questionnaires at a local ED clinic in a Midwestern metropolitan area. No compensation was given for participation in this study. This study was approved by the University of Minnesota Human Subjects Review Board.

Data analysis

Descriptive statistics including M, medians, modes, SD, and ranges for all variables were determined. To create a more parsimonious description of the large number of items on the EAQ, an exploratory principal component analysis with varimax rotation was conducted. The fit of the resulting factor structure was evaluated using eigenvalues >1 (15) and the scree test (16). Factor loading cutoffs were determined by values >0.40 as a criterion.

Results

Anxiety precipitants and management strategies

Endorsement rates of items for management strategies utilized “last week” (Table 1) ($M=2.52$, $SD=1.20$) were slightly, but not significantly, lower than items for management strategies endorsed for lifetime use (Table 2) ($M=2.75$, $SD=1.18$). “Eating alone” received the highest endorsement of the “last week” and lifetime anxiety management items ($M=3.02$, $SD=1.03$ and $M=3.22$, $SD=1.09$, respectively). Dinner was rated as the most anxiety-eliciting meal/snack. Of the anxiety-eliciting situation items (Table 3), unplanned eating or eating more than planned received the highest endorsement by average ($M=4.21$, $SD=0.88$ and $M=4.53$, $SD=0.77$, respectively) and the highest endorsement of “quite anxious” or “extremely anxious” by percentage (81 and 91%, respectively). Nine of 17 anxiety-eliciting items had “quite anxious” or “extremely anxious” endorsement rates in more than half of respondents.

Factor analysis

A six-factor solution was extracted from the short-range (“last week”) anxiety management strategies, collectively accounting for 74.57% of the variance among those items. Factors for the lifetime (“ever”) anxiety management strategies largely loaded onto similar constructs as the short-range management strategies and accounted for a similar percentage of variance. Table 4 includes exemplary items from the six-factor structure. A four-factor solution was extracted from the anxiety-eliciting situation items. Collectively, the four factors accounted for 68.3% of the variance. Table 5 lists exemplary items in this four-factor structure. All items on the EAQ reached criterion for loading onto a factor.

Diagnosis

BE was endorsed by 73.6% of the participants, where BE was defined by a positive endorsement of the EDDS items assessing both objective BE and loss of control. Within the anxiety management strategy sections, the BE group (N=39) endorsements were significantly lower on the “manipulation of food” factor ($F=7.805$, $p=0.008$) than the non-BE group (N=14). Within the anxiety-eliciting situations section, the only significant difference between BE and non-BE occurred for the “lack of planned eating” factor ($F=5.090$, $p=0.030$) in which the BE group reported lower ratings for this factor.

Discussion

This preliminary study finds that participants endorse anxiety in a wide variety of eating situations and engage in a diversity of behaviors to manage that anxiety. One notable finding is that the eating context anxiety ratings are consistently high, suggesting that individuals with ED often experience anxiety in a wide variety of eating situations. With regard to meals and snacks, dinner has the greatest degree of anxiety associated with it. It is also interesting that the self-reported anxiety management strategy frequencies vary little between the short-range (“last week”) and lifetime (“ever”) items. This finding suggests that a single anxiety management strategy, once deemed effective at reducing anxiety, is utilized for a long period of time with little substitution of other strategies. This finding may allow clinicians to target a limited, stable number of strategies with each individual. Although some situations and anxiety management strategies are endorsed more frequently, there is a surprisingly wide endorsement of almost all items on the questionnaire. This wide breadth of anxiety management strategies in a variety of anxiety-eliciting situations further supports the need for specific, tailored interventions geared towards anxiety reduction for each individual.

The factor analysis supports conceptual distinctions with regard to types of anxiety management strategies and anxiety-eliciting situations. Of the 54 EAQ items, none failed to reach criterion for loading onto a factor. In comparing the short-range (“last week”) and lifetime (“ever”) anxiety management sections of the EAQ that examine the same management strategies, the only factor discrepancy is in the absence of an alcohol-use factor of the short-range anxiety management section. This finding may be explained by the possible lack of opportunity for access to alcohol in the previous week, making this strategy relatively unrealistic for many participants.

Differences between BE and non-BE are consistently found for factors from both the anxiety management strategies and context sections of the EAQ. The “manipulation of food” factor is marked by higher rates of endorsement by non-BE individuals than BE individuals, which may be consistent with other reports on AN in the literature (17). Of the anxiety-eliciting situations factors, only the “lack of planning and control” factor shows a significant difference between BE and non-BE individuals; however, both “lack of control over the eating environment” and “comparison group/individual discrepancy” factors are notable for their descriptive value. Reaching statistical significance, the “lack of planning and control” factor indicates that non-BE individuals endorse more anxiety from the lack of planning and control, which is also consistent with previously published literature on AN (17, 18). The two other factors not significant would have likely been significant with a more robust sample size and are, therefore, worth acknowledging. As was true of the previous factors discussed, both “lack of control over the eating environment” and “comparison group/individual discrepancy” factors had greater endorsement rates from non-BE individuals.

Limitations of this study are its modest sample size and the heterogeneity of the sample. Although consistent factors found between the short-range (“last week”) and lifetime (“ever”) anxiety management strategies support the reliability of the factor loadings, replication using a larger sample size is needed in the future. The heterogeneous nature of the sample, while contributing to the generalizability of the study, is also a limitation. Although opportunities for write-ins were given for each section, it is quite likely some noteworthy situations and anxiety management strategies were absent from the questionnaire. Future studies should attempt to replicate this factor structure with larger, more homogeneous samples.

In summary, the findings of this study support the importance of anxiety in eating behaviors and suggest that patterns of anxiety and management strategies may differ by ED diagnosis. In addition to replicating these findings, future research should identify effective treatments to reduce and prevent eating-elicited anxiety as well as further understanding the role of this type of anxiety as a causal and maintenance mechanism in ED.

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TABLE 1
Frequencies of anxiety-mitigating techniques utilized in the “last week”

Items	Mean (standard deviation)	Percentage endorsing “often” or “always”
Avoid thinking of the calories in what I am eating	3.01 (1.20)	43
Watch TV while I eat	2.94 (1.21)	40
Eat alone	3.02 (1.03)	36
Have someone eat with me or eat with someone else	2.77 (1.25)	36
Talk to someone while I eat	2.92 (1.16)	32
Avoid thinking of the fat in what I'm eating	2.83 (1.22)	32
Cut food into smaller pieces	2.64 (2.64)	32
Read while I eat	2.60 (1.25)	30
Think about the exercise I'm going to do/have done that day	2.67 (1.26)	28
Drink large amounts of water or other liquids	2.60 (1.29)	26
Put seasoning or condiments on food	2.48 (1.26)	26
Eat food in a particular order	2.47 (1.45)	26
Avoid thinking of the sugar in what I am eating	2.58 (1.26)	25
Use the computer while I eat	2.36 (1.19)	17
Listen to music while I eat	2.15 (1.19)	15
Distract myself in some other way	2.23 (1.48)	13
Avoid smelling what I'm eating	1.70 (1.07)	9
Drink alcohol	1.33 (0.76)	4

TABLE 2
Frequencies of anxiety-mitigating techniques utilized “ever” (lifetime)

Items	Mean (standard deviation)	Percentage endorsing “often” or “always”
Think about the exercise I’m going to do/have done that day	3.22 (1.27)	42
Watch TV while I eat	3.12 (1.10)	42
Eat alone	3.22 (1.09)	40
Have someone eat with me or eat with someone else	3.19 (1.04)	40
Eat food in a particular order	3.06 (1.35)	40
Drink large amounts of water or other liquids	2.85 (1.35)	40
Avoid thinking of the calories in what I am eating	3.08 (1.02)	38
Read while I eat	2.83 (1.23)	36
Avoid thinking of the fat in what I’m eating	2.99 (1.05)	34
Cut food into smaller pieces	2.86 (1.33)	34
Put seasoning or condiments on food	2.89 (1.20)	32
Talk to someone while I eat	2.92 (1.06)	30
Avoid thinking of the sugar in what I am eating	2.68 (1.12)	25
Use the computer while I eat	2.56 (1.33)	25
Listen to music while I eat	2.42 (1.11)	17
Drink alcohol	1.79 (1.11)	13
Distract myself in some other way	2.22 (1.48)	8
Avoid smelling what I’m eating	1.75 (0.99)	6

TABLE 3
Frequencies of anxiety-eliciting situations

Items	Mean (standard deviation)	Percentage endorsing “often” or “always”
Eating more than I had planned to eat	4.53 (0.77)	91
Eating when I hadn't planned to eat at all	4.21 (0.88)	81
Binge eating	4.23 (1.11)	79
Eating in front of others whom I think are thinner than I am	3.92 (1.31)	77
Eating if I am self conscious about what I'm wearing	3.89 (1.31)	71
Eating foods I hadn't planned to eat	3.92 (1.03)	68
Eating in a new situation	3.67 (1.26)	62
Eating in front of people I don't know	3.40 (1.36)	55
Eating in restaurants	3.36 (1.01)	51
Eating new types of food	3.28 (1.28)	49
Eating food someone other than me has prepared	3.23 (1.25)	38
Eating in front of people I know	3.09 (0.99)	36
Eating when I can't be active afterwards	3.08 (1.51)	36
Eating when I don't have a time limit	2.76 (1.63)	36
Eating in front of friends	3.13 (1.02)	32
Eating in front of family members	2.85 (0.97)	28
Eating in front of others whom I think are larger than I am	2.77 (1.20)	26

TABLE 4
Factors and exemplary items from anxiety management strategies sections

	Factor loadings**
Factor 1: Avoidance of food content	
Avoid thinking of the fat in what I'm eating	0.936
Avoid thinking of the calories in what I'm eating	0.902
Factor 2: Manipulation of food	
Cut food into smaller pieces	0.797
Eat food in a particular order	0.761
Factor 3: Aural distraction	
Talk to someone while I eat	0.882
Have someone eat with me or eat with someone else	0.810
Listen to music while I eat	0.781
Factor 4: Visual distraction	
Use the computer while I eat	0.865
Watch TV while I eat	0.693
Factor 5: Olfactory distraction and exercise cognitions	
Avoid smelling what I'm eating	0.796
Think about the exercise I'm going to do/have done that day	0.471
*Factor 6: Inhibition reduction	
Drink alcohol	0.941

* 'Inhibition reduction' factor only present in lifetime ("ever") frequency analyses.

** Item factor loadings after varimax rotation.

TABLE 5
Factors and exemplary items from context sections

	Factor loadings ^{**}
Factor 1: Lack of control over eating environment	
Eating food someone other than me has prepared	0.830
Eating when I can't be active afterwards	0.769
Factor 2: Change in comparison group	
Eating in front of people I don't know	0.830
Eating in front of others whom I think are larger than I am	0.808
Factor 3: Lack of planned eating	
Eating when I hadn't planned to eat at all	0.822
Eating more than I had planned to eat	0.763
Factor 4: Binge eating characteristics	
Eating when I don't have a time limit	0.853
Binge eating	0.548

^{**} Item factor loadings after varimax rotation.