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Family Meal Frequency among Children and Adolescents with Eating Disorders

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Abstract

Purpose: Previous studies on family meals and disordered eating have mainly drawn their samples from the general population. The goal of the current study is to determine family meal frequency among children and adolescents with Anorexia Nervosa (AN), Bulimia Nervosa (BN), and Feeding or Eating Disorder Not Elsewhere Classified (FED-NEC), and to examine if family meal frequency is associated with eating disorder psychopathology.

Methods: Participants included 154 children and adolescents ($M=14.92\pm 2.62$), who met criteria for AN ($n=60$), BN ($n=32$), or FED-NEC ($n=62$). All participants completed the Eating Disorder Examination (EDE) and the Family Meal Questionnaire (FMQ) prior to treatment at the University of Chicago Eating Disorders Program.

Results: AN and BN participants significantly differed in terms of family meal frequency. A majority of participants with AN (71.7%), compared to less than half (43.7%) of participants with BN, reported eating dinner with their family frequently (five or more times per week). Family meal frequency during dinner was significantly and negatively correlated with dietary restraints and eating concerns among participants with BN ($r=-.381$, $r=-.366$, $p<.05$) and FED-NEC ($r=-.340$, $r=-.276$, $p<.05$).

Conclusions: AN patients' higher family meal frequency may be explained by their parents' relatively greater vigilance over eating, whereas families of BN patients may be less aware of eating disorder behaviors and hence less insistent upon family meals. Additionally, children and adolescents with AN may be more inhibited and withdrawn, and therefore are perhaps more likely to stay at home and eat together with their families.

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*Address correspondence to: Daniel Le Grange, PhD, The University of Chicago, Department of Psychiatry and Behavioral Neuroscience, 5841 S. Maryland Ave., MC3077, Chicago, IL Tel: 773-702-9277, Fax: 773-702-4443, legrange@uchicago.edu. Implications and Contribution

This study is the first to examine family meal frequency among clinical samples of youth with eating disorders. Findings suggest that patients with AN have higher rates of family meal frequency compared to patients with BN, and that family meal frequency is negatively associated with several eating disorder psychopathology scores.

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Disclosure of Conflicts:

None of the listed authors have a conflict of interest in the conduct or reporting of this research.

Keywords

family meal frequency; anorexia nervosa; bulimia nervosa; youth

INTRODUCTION

In recent years, there has been increasing interest in family meal patterns and the important role that family meals play in the emotional and behavioral development of adolescents (1, 2, 3). Regular family meals may contribute to the prevention, early detection, and treatment of unhealthy eating patterns (4, 5). Family meals provide an opportunity for role modeling healthy eating patterns which may serve to reinforce adolescents' healthy eating habits and prevent disordered eating behaviors (6). Participating in meals together as a family gives parents the opportunity to gather information on teens' current functioning, and furthermore gives parents the chance to observe eating habits and detect concerns early on. The implementation of consistent family meal patterns also plays a role in the treatment of adolescent eating disorders (7). For example, in family-based treatment, an essential aspect of the treatment is to encourage parents to establish a regular meal schedule (8, 9). Following a regular meal schedule, which increases accountability, may help patients with Anorexia Nervosa (AN) to achieve weight gain, and may reduce bingeing and purging in patients with Bulimia Nervosa (BN) (8,9). Despite the understanding of the psychological and physical value of family mealtime (1), there has been a lack of research done specifically on family meal frequency among youth with current diagnoses of an eating disorder.

Several studies have examined the association between family meal patterns and disordered eating in the general population (2, 4, 6). These studies have suggested that infrequent family meals may lead to a higher risk of disordered eating (10, 11). Longitudinal findings from the Project EAT (Eating Among Teens) study showed that regular family meals were associated with a lower prevalence of extreme weight control behaviors, including self-induced vomiting, and use of diet pills, laxatives, and diuretics (6). Ackard and Neumark-Sztainer's retrospective study asking female college students to recall their family meals patterns while growing up, found that those who reported higher family meal frequency were less likely to engage in bulimic behaviors (10). Additionally, Haines and colleagues' prospective study of over 13,000 preadolescents and adolescents, found that females who reported eating with their family most days or everyday of the week, were less likely to engage in disordered eating behaviors such as purging, binge eating, and dieting (4). Despite the growing literature that suggests a potential role of family meals in preventing disordered eating behaviors among the general population, the literature exploring associations between family meal patterns and eating disorders in adolescent clinical samples is scarce (12).

A better understanding of family meal patterns in youth with eating disorders is needed so that treatment plans can be tailored to their specific strengths and weaknesses. For example, for families that are already participating in regular family meals, the focus may be on enhancing parents' ability to help their children improve and/or modify eating patterns and

behaviors, while for patients who are not eating with their families frequently, implementing a regular family meal schedule may be a viable initial intervention.

The current study expands upon the existing literature and focuses specifically on family meal frequency and eating disorder psychopathology among clinical samples of adolescents with eating disorders. The study aims to answer two questions: (1) What is the frequency of family meals among children and adolescents with AN, BN and Feeding or Eating Disorder Not Elsewhere Classified (FED-NEC)? (2) Is family meal frequency associated with eating disorder psychopathology among youth with eating disorders? Findings from this study may contribute to the understanding of the role that family meals play among youth with eating disorders and may have implications for adaptations and new developments for treatment.

METHODS

Participants

Data were collected from children and adolescents presenting for an initial eating disorder evaluation at the University of Chicago Medicine's Eating Disorders Program between the years 2006 and 2012. Participants included 154 children and adolescents, aged 7 to 18 years ($M=14.92\pm 2.62$), with a mean body mass index (BMI) of 20.05 ± 6.56 (kg/m^2) and mean percent of ideal body weight of 102.33 ± 36.76 (%). Percent of ideal body weight was defined as current BMI divided by 50th percentile BMI for age and gender using Centers for Disease Control and Prevention growth charts (13). Participants met DSM-5 (14) criteria for AN (39.0%; $n=60$; minimum age=11.5), BN (20.8%; $n=32$; minimum age=8.5), or FED-NEC (40.2%; $n=62$; minimum age=7.6), and were mostly female (87.7%; $n=135$) and Caucasian (83.7%; $n=129$). The clinical characteristics of the FED-NEC group were consistent with previous reports about children and adolescents with this classification (20). Based on Eddy et. al's work our FED-NEC group was characterized into 5 subgroups: sub threshold AN (17.5%; $n=11$), sub threshold BN (15.9%; $n=10$), FED-NEC purging (34.9%; $n=22$), FED-NEC bingeing (14.3%; $n=9$); and other (17.5%; $n=11$) (20). Table 1 shows the characteristics of the participants by eating disorder subtype.

Procedure

Participants completed a structured interview and paper-and-pencil questionnaires during a 3-hr baseline assessment. All data were collected before the start of treatment. Written informed consent for patients 18 years of age, or parental/guardian consent and adolescent assent for patients under 18 years of age were obtained. The University of Chicago's Institutional Review Board approved this study.

Measures

The Eating Disorder Examination (EDE) is a semi-structured investigator-based interview measuring cognitive and behavioral symptoms related to eating disorders (15). Cognitive symptoms of eating disorders are assessed using a 7-point Likert scale, with higher scores indicating more severe eating-related psychopathology. The EDE provides a global score reflecting the overall severity of the eating disorder symptoms and four subscale scores. The subscales are Restraint (e.g. food avoidance and dietary rules), Eating Concern (e.g.

preoccupation with food, eating, or calories and guilt about eating), Shape Concern (e.g. dissatisfaction and preoccupation with shape and discomfort about body exposure), and Weight Concern (e.g. importance of weight and desire to lose weight). To obtain an overall or 'global' score, the four subscales scores are added together and the resulting total is divided by the number of subscales (i.e. four) (15). Behavioral symptoms of eating disorders such as frequency of self-induced vomiting, laxative misuse, diuretic misuse, driven exercise, fasting, subjective and objective binge eating are also assessed. The EDE has demonstrated good reliability and validity and has been utilized in multiple studies of youth with eating disorders (16, 17). The EDE was used to generate DSM-5 diagnoses for an eating disorder.

The Family Meal Questionnaire (FMQ-child version) is a self-report three-item assessment of the frequency of each family mealtime (breakfast, lunch, and dinner) (10). Specifically, the questions ask "How often do you eat [specify a meal] with your family?", and the five response choices are less than weekly; 1–2 times per week; 3–4 times per week; 5–6 times per week; or every day. The FMQ has previously been used in several studies (10, 11).

Physical Assessment: A trained research assistant using a calibrated digital or balance-beam scale measured the weight and height of each participant. All patients were weighed without shoes and in light, indoor clothing.

Data Analysis

Data were analyzed using SPSS Version 19. Chi-Square test and One-way ANOVA were used to compare the groups on age, gender, race, family structure, %IBW, BMI, EDE total score, and family meal frequency. In order to obtain a larger cell group when using the Chi-Square test to look at prevalence of family meals, the five original response choices of the FMQ were regrouped into three response choices: 2 or fewer times per week, 3–4 times per week, or 5 or more times per week. One-way ANCOVA was used to compare groups on family meal frequency with covariates.

We added age and gender as covariates in the one-way ANCOVA test to ensure that the differences between groups resulted from different diagnoses rather than differences associated with age and gender. It may be that developmental differences between younger children and older adolescents in terms of autonomy and ability to eat outside the home may influence younger children to eat with their families more frequently than older adolescents (1). Furthermore, it is also possible that gender plays a role in family meal patterns. We also considered using family structure and race as covariates but they did not significantly contribute to any of the models and thus were removed from the final analyses. Pearson's correlations were used to examine relations between family meal frequency and EDE scores, while controlling for age and gender. Linear regression analyses were also performed among participants with AN and BN. These analyses were conducted in order to examine the role of the eating disorder diagnosis as a moderator within the association between total family meal frequency and eating disorder psychopathology, while adjusting for age and gender as covariates. The original five categories of the FMQ were used as a continuous measure for

the one way ANCOVA, Pearson correlations, and regression analysis. Missing values were estimated with full information maximum-likelihood estimation.

RESULTS

General results from the FMQ (Table 2) indicate that participants with different diagnoses of eating disorders differ in their family meal patterns. The majority of participants with BN (81.2 %), and FED-NEC (62.9 %) reported eating breakfast with their family infrequently (two or fewer times per week). The majority of participants in all three groups (AN: 59.0 %, BN: 79.4 %, FED-NEC: 69.4 %) reported eating lunch with their families infrequently. Lastly, the majority of participants with AN (71.7%), and FED-NEC (65.0 %) reported eating with their family frequently (five or more times per week), as compared to less than half of participants with BN (43.7%).

In order to compare overall frequency of family meals with covariates we also compared the FMQ scores of participants with AN, BN, and FED-NEC, while using age and gender as controlling variables. Means and standard deviations of the results from the FMQ are reported in Table 3. The ANCOVA was significant for breakfast ($F(2,152)=6.15, p<.001$), lunch ($F(2,152)=5.95, p<.001$), and dinner ($F(2,152)=7.99, p<.01$), and post-hoc comparisons revealed that children and adolescents with AN reported significantly higher frequency of family meals during breakfast, lunch, and dinner than children and adolescents with BN. Furthermore, children and adolescents with FED-NEC reported significantly higher frequency of meals during breakfast and lunch, but not during dinner, as compared with children and adolescents with AN. There were no significant differences found between the FED-NEC group and the BN group in terms of reported family meal frequency.

Correlations between the FMQ and eating disorder psychopathology (as measured by the EDE) are shown in Table 4. To ensure that correlations were not falsely inflated due to the diagnostic distinctiveness of the three groups, the correlations are presented separately for the AN, BN and FEDNEC groups. Frequency of family meals during dinner was significantly and negatively correlated to the EDE global score among the BN and FED-NEC groups. Patients with BN and FED-NEC that reported higher family meal frequency during dinner reported lower eating disorder psychopathology. No significant correlations were found among the AN group between family meal frequency of breakfast, lunch, and dinner and EDE scores.

Finally, we conducted a moderation analysis to examine the unique contribution (if any) of the interaction between reported total family meal frequency and eating disorder diagnoses (of AN or BN) to the global eating disorder psychopathology score on the EDE. The results are presented in Table 5. When controlling for measures of age and gender, eating disorder diagnosis was rendered as a significant predictor ($\beta=.270, p<0.05$) and family meal frequency was rendered as a non significant predictor ($\beta=.059, p>0.05$) of eating disorder psychopathology. Moreover, when the interaction between family meal frequency and eating disorder diagnosis was added to the model, eating disorder diagnosis ($\beta=.614, p<0.05$), family meal frequency ($\beta=.679, p<0.05$) and the interaction between the two of

them ($\beta=.6, p<0.05$) was rendered as a significant predictor to the dependent variable of eating disorder psychopathology.

DISCUSSION

The aim of the present study was to examine frequency of family meals among children and adolescents with eating disorders. The results show that children and adolescents with AN, BN, and FED-NEC differ in the frequency of their family meals, and that higher family meal frequency is associated with less eating disorder psychopathology among children and adolescents with BN and FED-NEC. This study builds upon the extant literature suggesting that family meals may help to protect against disordered eating attitudes and behaviors (5, 10, 11), by identifying several correlations between family meal frequency and eating disorder psychopathology in a clinical sample.

Our study showed that when controlling for age and gender, patients with AN report higher rates of total family meal frequency as compared to patients with BN and FED-NEC. One explanation for these differences may be due to the specific nature of AN. The severity of AN is more 'visible' whereas symptoms of BN and FED-NEC are more commonly hidden and might take longer to detect (18). AN patients' higher family meal frequency may be explained by their parents' relatively greater vigilance over eating, whereas families of BN and FED-NEC patients may be less aware of the presence of eating disorder behaviors and hence less insistent upon family meals. Another explanation may be that patients with AN may be more inhibited and withdrawn from their peers, as compared to patients with BN and FED-NEC (19). Therefore it is possible to speculate that a child with AN may stay home more often and perhaps participate in more family meals.

Our findings suggest several significant correlations between family meal frequency and eating disorder psychopathology among children and adolescents with BN and FED-NEC. For example, higher total family meal frequency was associated with lower eating concerns among the BN group and lower dietary restraint among the FED-NEC group. These findings support Fiese et al's perspective that family mealtime is a household routine that provides stability and predictability for children and is related to important child health outcomes (21). Family mealtimes may provide an opportunity for parents to monitor their children's eating behaviors, and detect unhealthy eating patterns early on. Furthermore, family meals can serve as an opportunity for parents to demonstrate healthy eating patterns that can influence children's eating disorder cognitions and behaviors (10, 11). However, these associations between family meal patterns and severity of eating disorder psychopathology were not found among the AN group. Similarly, our moderation model showed that the link between family meal frequency and eating disorder psychopathology differed among the AN and BN groups, and that eating disorder diagnosis acted as a moderator between family meal frequency and eating disorder psychopathology.

To our knowledge, this is the first study to investigate family meal frequency in children and adolescents with eating disorders. A strength of the current study is that the participants reported their current frequency of family meals, whereas other studies used retrospective reports that asked participants to recall frequency of family meals while growing up (10).

Another strength of the study is that adolescents included in the sample had diagnoses spanning the eating disorder diagnostic spectrum (i.e., AN, BN, and FED-NEC). The comparison of patients with AN, BN, and FED-NEC ensures that it was the specific eating disorder diagnoses that contributed to the group differences, rather than the presence of an eating disorder in general. Finally, eating disorder psychopathology was assessed using the EDE, a well-validated semi-structured interview. EDE scores in our study were similar to scores reported in previous studies among youth with eating disorders (20).

While this study has multiple strengths it also has several limitations. First, the sample consisted of children and adolescents who were seeking treatment for their eating disorders, which limits generalization to non-treatment seeking samples. Second, our reports only look at family meal frequency at the time of the assessment, which may only represent the current family meal patterns. It is possible that the current family meal patterns may have been impacted by the onset of the eating disorder. The report may not accurately represent the changes in family meal pattern over time, and over the course of the eating disorder. Third, our study population did not include a non-eating disorder control group, which limits our understanding of how youth with eating disorders compare to the general population. It may be that the frequency of family meals reported by the AN group was higher relative to the general population or that the frequency of family meals reported by the BN/FED-NEC groups was lower relative to the general population. However, given this study's lack of control group, it was impossible for us to make this comparison. Moreover, comparing our results with previous studies that have been conducted in the general population was not possible as these studies assessed family meal patterns using different measures (5) or different age groups (10). Finally, the cross-sectional nature of this study makes it more difficult to determine the direction of influence and whether a lower frequency of family meals contributes to or results from more severe eating disorder psychopathology.

These findings may have implications for adaptations and new developments for eating disorder intervention and treatment. Specifically, in family-based treatment for youth with eating disorders, where parents play an active role in helping to restore their child's weight and prevent bingeing and purging (8, 9), our findings suggest that therapists should assess for family meal patterns at the start of treatment. This assessment could help therapists and families to identify strengths and areas of opportunity and to build the most effective treatment plan. For AN patients who are already eating with families frequently, the focus may be on enhancing parents' efficacy to help their child eat at those meals, while for BN patients who are not eating with families regularly, instituting regular family meals may be an effective initial intervention.

The current study is the first attempt to examine family meal frequency among children and adolescents with eating disorders. In order to better understand the role of family meals in the development and maintenance of eating disorders, future work should look at additional variables such as the quantity and types of food consumed at each meal, the number of participants, and the time spent sitting together at the table, as well as other family factors such as perceived family atmosphere, family cohesion, and family stability. Future studies should investigate these findings using a longitudinal design in order to examine occurrence

of family meals before and after the onset of the disorder, and in order to assess whether family meals would stave off relapse.

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List of Abbreviations

AN	Anorexia Nervosa
BN	Bulimia Nervosa
FED-NEC	Feeding or Eating Disorder Not Elsewhere Classified
BMI	Body Mass Index
EDE	Eating Disorder Examination
FMQ	Family Meal Questionnaire

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TABLE 1

Patient Characteristics by Eating Disorder Subtype

		AN (<i>n</i> =60)	BN (<i>n</i> =32)	FED-NEC (<i>n</i> =62)	Test Statistic
Age	<i>M</i> (<i>SD</i>)	15.21 (2.17) ^a	15.98 (2.68) ^a	14.08 (2.75) ^b	$F(2,152)=6.64, p<0.005$
Female	% (<i>n</i>)	90.0(54)	90.6(29)	82.3(51)	$\chi^2=2.08, p=.35$
Caucasian	% (<i>n</i>)	90.0(54)	78.1(25)	79.0(49)	$\chi^2=3.46, p=.18$
Intact Family	% (<i>n</i>)	83.3(50) ^a	65.6(21) ^{ab}	62.9(39) ^b	$\chi^2=6.61, p<0.05$
BMI	<i>M</i> (<i>SD</i>)	15.97 (1.27) ^a	22.84 (6.38) ^b	22.57 (7.66) ^b	$F(2,152)=25.15, p<0.001$
% Ideal Body Weight	<i>M</i> (<i>SD</i>)	79.59(8.07) ^a	113.99(34.76) ^b	118.49(43.20) ^b	$F(2,152)=25.06, p<0.001$
EDE Global Score	<i>M</i> (<i>SD</i>)	2.04(1.47) ^a	2.93(1.43) ^b	1.78(1.38) ^a	$F(2,152)=6.84, p<0.001$

Note: Differing letters indicate significant differences.

TABLE 2

Frequency of Family Mealtimes¹

		Prevalence (%)			Chi-Square
		AN	BN	FEDNEC	
		(n=60)	(n=32)	(n=62)	
Breakfast	<2 times/wk	49.1	81.2	62.9	$\chi^2=12.40$, $p<0.05$
	3-4 times/wk	6.8	9.4	9.7	
	>5 times/wk	44.1	9.4	27.4	
Lunch	<2 times/wk	58.3	81.2	64.5	$\chi^2=9.41$, $p<0.05$
	3-4 times/wk	16.7	18.8	16.1	
	>5 times/wk	25.0	0.0	49.4	
Dinner	<2 times/wk	13.3	21.9	17.5	$\chi^2=10.66$, $p<0.05$
	3-4 times/wk	15.0	34.4	17.5	
	>5 times/wk	71.7	43.7	65.0	

¹Five categories of family meal frequency were regrouped to three categories.

TABLE 3Means and standard deviations of family meal frequency per week¹, with age and gender as covariates

		AN (n=60)	BN (n=32)	FEDNEC (n=62)	Test Statistic
Breakfast	<i>M (SD)</i>	2.07 (1.59) ^a	1.51 (1.18) ^b	1.31 (1.59) ^b	$F(2,152)=6.15, p<0.001$
Lunch	<i>M (SD)</i>	1.71 (1.29) ^a	0.88 (0.76) ^b	1.22 (1.29) ^b	$F(2,152)=5.95, p<0.001$
Dinner	<i>M (SD)</i>	3.13 (1.15) ^a	2.49 (1.34) ^b	2.75 (1.31) ^{ab}	$F(2,152)=3.67, p<0.01$
Total	<i>M (SD)</i>	2.31 (1.14) ^a	1.51 (0.83) ^b	1.76 (1.12) ^b	$F(2,152)=7.99, p<0.001$

¹ Five point Likert scale, with 0=less than weekly, and 4= every day.

^{ab} Differing letters indicate significant differences.

TABLE 4

Correlations between Family Meal Frequency and EDE Scores among AN, BN and FED-NEC, with age and gender as covariates

	EDE			EDE			EDE			EDE					
	Weight Concerns			Shape Concerns			Dietary Restraint			Eating Concern			Global Score		
	AN (n=60)	BN (n=32)	FEDNEC (n=62)	AN (n=60)	BN (n=32)	FEDNEC (n=62)	AN (n=60)	BN (n=32)	FEDNEC (n=62)	AN (n=60)	BN (n=32)	FEDNEC (n=62)	AN (n=60)	BN (n=32)	FEDNEC (n=62)
Breakfast	.095	-.325	.134	.160	-.050	.082	.140	-.102	-.075	.271	-.240	-.050	.183	-.216	.028
Lunch	.200	-.098	-.063	.233	-.102	-.138	.102	-.015	-.330*	.240	-.158	-.219	.215	.016	-.212
Dinner	-.020	-.298	-.110	.045	-.078	-.275*	.053	-.381*	-.340*	.050	-.366*	-.276*	.037	-.330	-.282*
Total	.113	-.293	-.011	.178	-.037	-.135	.122	-.260	-.315*	.233	-.361*	-.230	.179	-.280	-.194

* p<0.05

Table 5

Standardized Regression Coefficients Predicting EDE Global Score among Participants with AN and BN

Predictors	Outcome- EDE Global Score		
	Step 1	Step 2	Step 3
Age	.252*	.216*	.208
Gender	-.228*	-.242*	-.213*
ED diagnosis (AN or BN)		.270*	.614*
FMQ Total		.059	.679*
FMQ Total * ED diagnosis			-.612*
R-Sq.	.150	.212	.250

*
p<0.05