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The Course of Eating Disorders Involving Bingeing and Purging Among Adolescent Girls: Prevalence, Stability, and Transitions

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Abstract

Purpose: To quantify eating disorder (ED) stability and diagnostic transition among a community-based sample of adolescents and young adult females in the United States.

Methods: Using 11 prospective assessments from 9,031 U.S. females ages 9−15 years at baseline of the Growing Up Today Study, we classified cases of the following EDs involving bingeing and purging: bulimia nervosa (BN), binge ED, purging disorder (PD), and subthreshold variants defined by less frequent (monthly vs. weekly) bingeing and purging behaviors. We measured

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Supplementary Data

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number of years symptomatic and probability of maintaining symptoms, crossing to another diagnosis, or resolving symptoms across consecutive surveys.

Results: Study lifetime disorder prevalence was 2.1% for BN and roughly 6% each for binge ED and PD. Most cases reported symptoms during only one survey year. Twenty-six percent of cases crossed between diagnoses during follow-up. Among participants meeting full threshold diagnostic criteria, transition from BN was most prevalent, crossing most frequently from BN to PD (12.9% of BN cases). Within each disorder phenotype, 20%−40% of cases moved between subthreshold and full threshold criteria across consecutive surveys.

Conclusions: Diagnostic crossover is not rare among adolescent and young adult females with an ED. Transition patterns from BN to PD add support for considering these classifications in the same diagnostic category of disorders that involve purging. The prevalence of crossover between monthly and weekly symptom frequency suggests that a continuum or staging approach may increase utility of ED classification for prognostic and therapeutic intervention.

Keywords

Eating disorders; Adolescents; Classification; Transition; Bulimia nervosa; Purging disorder; Binge eating disorder; Epidemiology; OSFED; DSM

Studying the stability of eating disorder (ED) subtypes is important because diagnostic boundaries may have limited clinical utility if individuals exhibit frequent fluctuation between ED categories. It is critical specifically to examine diagnostic crossover among ED phenotypes during adolescence, the period of life when ED incidence is highest [1–3]. However, little is known about stability of and transition between ED diagnostic categories among adolescent populations not derived from clinical samples [4–9]. Given that a minority of individuals with an ED receives treatment [6,10,11], it is unclear the extent to which results from treatment-seeking populations are generalizable.

Existing community-based research on ED crossover among adolescents suggests limited stability, with transient duration and high rates of transition between phenotypes over time [1–3]. However, the majority of the literature has focused on migration between anorexia nervosa (AN) and its subtypes and bulimia nervosa (BN) [12–15]. Less is known about the course of other bingeing and purging disorders (PDs) recognized in DSM-5 classification, specifically binge ED (BED) and diagnoses within “Other Specified Feeding and Eating Disorders” (OSFED), which includes subthreshold variants of BN and BED and PD (characterized by frequent purging but not engaging in binge eating) [1,3,16]. BED and OSFED are more prevalent than AN and BN combined, and subthreshold EDs are the most common ED diagnoses [1,17–19]. Further, PD prevalence is comparable to BED [6], but there is minimal research on diagnostic crossover that addresses stability and transition for PD [1,3,7]. PD and BN are associated with some of the same adverse outcomes [6,20], and evidence of frequent crossover between these disorders could support the recommendation to classify disorders by those involving purging (BN and PD) and those that only involve binge eating (BED) [6].

Two relatively small community-based studies of DSM-5 classification found fluctuation between BED and BN to be the most common transition, but each study included fewer than

150 ED cases [1,3]. Other evidence suggests that symptom reduction, that is, crossover from BN to BED, PD, or other OSFED subtypes, may be the most prevalent type of transition [13,21], but these trajectories were largely found among women receiving treatment for their disorder. Additional large, prospective studies are needed to build the literature [1–3,22] on the natural history of EDs in the pediatric general population.

Accordingly, the purpose of this study was to examine the course of EDs involving bingeing and purging among a community-based sample of more than 9,000 adolescent and young adult females from across the United States participating in the Growing Up Today Study (GUTS). Specifically, we aimed to measure disorder prevalence, stability, and transition between ED presentations by quantifying number of survey years symptomatic and probability of symptom maintenance or crossover throughout 11 longitudinal assessments from 1996 to 2013.

Methods

Study design and sample

GUTS began in 1996 by recruiting children of women in the Nurses' Health Study II to study predictors of weight change in adolescence [23]. Invitation letters and baseline questionnaires were mailed to 13,261 girls ages 9−15 whose mothers consented to their recruitment. In total, 9,039 females returned completed questionnaires and assented to participate in the cohort. Additional study details have been reported previously [23]. Participants were sent questionnaires annually in 1996−2001 and in 2003, 2005, 2007, 2010, and 2013. Analyses of diagnostic transition were restricted to the 9,031 females who reported that they were aged 9−15 at baseline. To examine number of survey years symptomatic, we further restricted to the females who responded to at least three consecutive surveys at any point during follow-up (n = 8,210).

The study was approved by the Human Subjects Committee at Brigham and Women's Hospital and analyses were approved by the Institutional Review Boards at Brigham and Women's Hospital and Boston Children's Hospital.

Measures

We assessed six bingeing and purging ED phenotypes: BN, BED, PD, and subthreshold classifications of each disorder. Since the GUTS surveys did not assess weight concerns after 2007, we did not include AN in our main analyses (Supplementary Tables S1 and S2). We examined prevalence of AN, number of years symptomatic, and diagnostic crossover, restricting the sample to surveys through 2007 to enable inclusion of AN, in supplementary analyses.

Disordered eating and weight-related cognition were assessed on all questionnaires with the McKnight Risk Factor Survey, a validated screening instrument [24]. To evaluate purging behavior, questionnaires asked how often in the past year the girl made herself throw up or used laxatives to lose weight or to prevent weight gain. We did not assess diuretic abuse, excessive exercise, or fasting, and therefore did not capture all DSM-5 criteria for compensatory behaviors. Binge eating was assessed in two parts: participants

were asked about frequency over the past year of eating a very large amount of food and girls who reported overeating were asked whether they felt out of control and could not stop eating even if they wanted to during these episodes. The definition of binge eating required that participants reported both eating a very large amount of food in a short amount of time and feeling out of control during the eating episode. A validation study comparing self-report in GUTS to interview assessment using the Eating Behavior Interview, a semistructured adaptation of the gold standard Eating Disorder Examination Interview to measure bulimic behaviors in preadolescents and adolescents, confirmed the accuracy of the questionnaire in assessing purging (sensitivity: .93, specificity: .86, negative predictive value: .99) [25]. Specificity and negative predictive value, the measures endorsed as most useful for screening for bulimia [25,26], were high (.78 and .98, respectively) for binge eating.

Weight and shape concerns were measured using four McKnight Risk Factor Survey (MRFS) weight concern items ("In the past year, how often have you felt fat?", "In the past year, how often have you thought about wanting to be thinner?", "In the past year, how often have you worried about having fat on your body?", and "In the past year, how much have you worried about gaining 2 pounds?"). Mean response on a scale of 1−5 (response options: never, a little, sometimes, a lot, and always) was used to create a dichotomous indicator of high levels (mean score ≥ 4) of weight/shape concerns [23]. Body mass index (in kg/m^2) was calculated from self-reported height and weight data. For participants under 18 years of age, we classified underweight based on the age equivalents to the World Health Organization grade I thinness cutoff [27]. Participants age 18 years and older with body mass index < 18.5 were classified as underweight.

At each time point, participants were categorized into mutually exclusive ED categories of BN, BED, PD, and subthreshold variants using DSM-5 criteria [8]. Girls who reported both bingeing at least weekly and purging at least weekly were classified as having BN. Girls who reported that they engaged in an average of at least weekly binge eating over the past 12 months but did not purge or purged less than monthly were classified as having BED. Girls who reported an average of at least weekly purging and did not binge eat, or binged less than monthly, were classified as having PD. We applied the DSM-5 BED and BN weekly symptom threshold to assign PD even though OSFED disorders do not have a symptomatic cutoff. Subthreshold variants were defined by an average of at least monthly frequency over the past year of bingeing and/or purging episodes; individuals who reported both behaviors but at different frequency (weekly purging and monthly bingeing or vice versa) were classified as subthreshold BN.

For supplementary analyses, girls who were both underweight and reported high levels of weight or shape concerns were classified as having AN. Since AN has been shown to have very low prevalence in population-based samples such as the National Comorbidity Survey Replication Adolescent Sample [10] and prior GUTS analyses [6], there would not be a sufficient number of cases to investigate AN subtypes (restricting (ANR) or binge-eating/purging [ANBP]). However, we assessed the proportion of individuals who simultaneously met criteria for both AN and either BN, BED, or PD to identify the extent to which AN cases may represent the anorexia binge-purging (ANBP) subtype.

Statistical analysis

Nonresponse analyses.—We used chi-square and independent samples t tests to compare baseline characteristics of the full study sample (n = 9,031) to participants who responded to at least three consecutive surveys (n = 8,210). Fisher's exact tests were used in cases of sparse data. All tests were two sided, with a threshold of $p < .05$ used to determine statistical significance.

Number of survey years symptomatic.—Among participants who responded to at least three consecutive surveys (n = 8,210), we examined number of survey years symptomatic across the 11 administrations. Participants may have been symptomatic for only part of the year, but if their reported average frequency of binge eating and/or purging was at least monthly/weekly, they would be considered to be symptomatic in that year.

Transition and stability analyses.—We defined transition as movement from any full or subthreshold condition to another across consecutive survey waves. Stability was defined as meeting the criteria for the same disorder for two or more consecutive surveys and not subsequently showing transition during follow-up.

Primary analyses of stability and transition were performed on the full sample of 9,031 females, including participants missing data during follow-up. We were unable to classify the course of illness for 15%−20% of ED cases with full or subthreshold disorders who did not have complete ED data across two survey waves and therefore could not be categorized into a given trajectory. To examine sensitivity of our results to loss to follow-up or item non-response, we imputed five data sets, replicated stability and transition analyses across each imputation, and compared results to those of the main analyses. Imputation was conducted using Proc MI in SAS with data assumed to be missing at random. Potential causes or correlates of missingness were included in the imputation model; nominal variables (overweight/obesity, thinness, high weight/shape concerns, and a mutually exclusive categorical variable for ED phenotypes) were imputed using the fully conditional specification (FCS) discriminant function method and continuous (age) using predictive mean matching [28].

Results

The mean age of participants at baseline was 12 years (Table 1). Prevalence of all ED subtypes at baseline was less than 1%, with the lowest prevalence reported for both full and subthreshold variants of BN.

Compared with the full sample of adolescent girls who responded to at least one GUTS survey, participants who responded to at least three consecutive surveys were, at baseline, very slightly younger, less likely to engage in bingeing or purging, and less likely to report shape or weight concerns (Table 1).

Disorder prevalence

Over 11 survey administrations, the most common full criteria EDs were BED and PD, with a study lifetime prevalence of roughly 6% each (Table 2). A total of 2% of girls had

BN during follow-up. Age-specific prevalence of BN and BED was highest among 19−22 years old, and was stable at a peak of 2.5% for PD from ages 16 through 27. Subthreshold disorders were more prevalent than their respective full criteria variants (Table 4). Across surveys through 2007, the prevalence of AN was 1.6% (n = 145) (Table 2). There were very few participants that met AN classification and simultaneously reported bingeing and/or purging behaviors (7/186 BN cases, 7/555 for BED, 8/563 for PD, 6/323 for subthreshold BN, 6/1103 for subthreshold BED, and 10/720 for subthreshold PD; data not shown in table).

Number of survey years symptomatic

Among individuals who responded to three consecutive surveys (n = 8210), the majority of females with an ED reported symptoms in 1 year only (Table 3). While disorder prevalence was higher among younger girls (ages 9−12 at baseline), the number of survey years symptomatic did not vary by baseline age. Approximately 4%−6% of females with full threshold ED classification reported the same symptoms in three or more consecutive surveys. In supplementary analyses through 2007, 140 participants (96.6%) with AN responded to three or more consecutive surveys. Of these cases, 106 (75.7%) reported symptoms in a single survey year, 25 (17.9%) in two surveys, and 9 (6.4%) in three or more surveys (data not shown in table).

Transition and stability among full threshold disorders

Among BN, BED, and PD cases, most (74%) did not experience diagnostic transition, but 17% of individuals crossed between disorders once, 6% twice, and 3% made three or more transitions (data not shown). Transition from BN to BED (5.9% of BN cases) occurred more frequently than from BED to BN (1.8% of BED cases) (Table 4). Among disorders with weekly symptomology, probability of transition was highest from BN to PD; the fraction of individuals crossing from BN to PD (12.9% of BN cases) was roughly twice that of any other transition between disorders with at least weekly bingeing or purging behavior. We observed the same patterns across each of the five imputed data sets (Supplementary Tables S2–S6). In our main analyses, roughly 7%−13% of participants exhibited stability in their ED classification, meeting criteria for the same ED across two consecutive surveys and not subsequently crossing to a different disorder. When missing data were imputed, stability increased to roughly 20%−30%. We observed limited crossover involving AN in the subsample of data through 2007, with the most frequent transition occurring from AN to BN, and stability in 11.7% (n = 17) of cases.

Transitions with subthreshold eating disorder criteria

Transition patterns across subthreshold ED phenotypes were similar to those for weekly symptomology, with generally greater crossover from subthreshold BN to subthreshold PD than between either of these disorders and subthreshold BED in both main results and in imputation sensitivity analyses. A total of 12.7% of subthreshold BN cases increased symptom frequency across consecutive surveys but dropped one of the disordered eating behaviors, crossing from subthreshold BN to full threshold PD or BED. Progression from monthly to weekly symptoms of the same disorder occurred in roughly 8%−10% of cases, most frequently among individuals with subthreshold BED (10.4%; Table 4).

Decreased (weekly to monthly) bingeing and purging frequency within the same disorder symptomology occurred in roughly 14%−20% of ED cases. When missing data were imputed, moving from weekly to monthly symptoms of the same ED was more common than in the main analyses (20% of BN and PD, 30% of BED cases [Supplementary Tables S2–S6]).

Discussion

We found that most females with an ED reported symptoms in only one survey, and observed similar distributions for number of symptomatic survey years across ED subtypes. We did not find evidence of variation in number of symptomatic years by baseline age.

BED and PD each were more common in this community-based sample of adolescent females than BN and AN combined. Transition between BED or PD or from either disorder to BN, indicating a switch from bingeing to purging or the addition of one of these behaviors, was less frequent (<6% of BED or PD cases) than full threshold crossover from BN (19% of BN cases). BN cases were more likely to maintain purging symptoms in the absence of binge eating and move to PD than to BED classification. Partial ED resolution marked by reduction in symptom frequency (full to subthreshold criteria) occurred in up to one third of ED cases in imputation analyses. Given the new DSM-5 remission specifiers for full threshold diagnoses, these individuals would be classified within their initial disorder rather than given a new diagnosis.

Our finding that most ED cases reported symptoms in one survey year only suggests a shorter average illness duration than often reported in treatment-seeking samples, but is in line with estimates from one community sample in the United States [1,29] as well as European and Australian community samples showing transient abnormal eating behavior among adolescents [2,22]. Results suggest that treatment-seeking cases may represent the most serious or persistent disorders rather than a general sample of all cases, and caution against generalizing observations of ED course among individuals receiving treatment to the larger community. Further, BN has been associated with lower likelihood of remission compared to BED in studies of shorter duration [21,30] and we extend these findings to show resolution of ED symptoms in a smaller proportion of individuals with BN than those with BED or PD, inclusive of both full and subthreshold variants, across nearly two decades of follow-up.

Our results add to the evidence quantifying probability of diagnostic transition in community-based studies of pediatric participants. Contrary to our findings, Allen et al. and Stice et al., who each had less than 150 ED cases and were drawn from a single city or region, found that crossover was most likely for DSM-5 diagnoses with binge eating [1,3]. Our study of more than 9,000 females throughout the United States provides empirical support for diagnostic fluctuation involving PD. In a treatment-seeking sample, Eddy et al. (2010) similarly found crossover from BN to PD in a higher proportion (50%) of cases than from BN to BED (20%) [13]. These findings add support for considering BN and PD in the same diagnostic category of EDs that involve purging, given that these illnesses share risk factors [31] and are similarly associated with developing psychopathology, emotional

distress, depression, and suicidality as well as overweight/obesity, drug use, and binge drinking [1,3,6,20,32]. Moving PD out of the heterogeneous OSFED group and combining with BN may improve the clinical utility of ED diagnostic categories by providing a full threshold diagnosis for individuals at similar risk for adverse outcomes as those already recognized as such by DSM-5 classification.

Studies report crossover from BN to AN in 0%−7% of cases [33–36] and that up to 50% of patients with AN restricting type will develop full symptoms of BN [12,14,37]. We confirm more transition from AN to BN than vice versa but at a far lesser frequency than in treatment samples, suggesting that this course is much less common among females in the general community. Finally, we found that subthreshold disorders were common precursors to or descendants of weekly bingeing and purging symptomology, supporting prior evidence [6,13,18,38,39] that subthreshold presentations may be an important component of the natural course of EDs. Treasure et al. [38] found a staging heuristic to be useful in charting the trajectory of AN and that treatment matched to the stage of illness may maximize the success of intervention. Our findings suggest extension of this logic outside of AN. Streamlining classification according to the longitudinal course of illness, incorporating prodromal and partial features of illness, full threshold symptoms, and more advanced and potentially treatment resistant phases, may improve the ability to anticipate progression and avoid full manifestation of illness features as well as to manage remission and prevent relapse [38]. Further research into how to optimize configuration of disease staging as a continuum of symptom frequency (e.g., sub- to full threshold disorders) and/or type (bingeing or purging only, or both), and the utility of such a diagnostic scheme for predicting and managing symptomology, is warranted.

One limitation of this study is the use of self-reports of ED attitudes and behaviors, which may result in misclassification. Binge eating and purging questions have been validated previously in the GUTS cohort; while there was some over-reporting of binge eating behaviors, results indicate that the survey rarely misses cases [25]. We acknowledge that we did not assess all DSM-5 criteria for compensatory behaviors due to the omission of diuretic abuse, excessive exercise, and fasting. Use of a more restrictive definition may introduce misclassification and underestimate true disorder prevalence. Further, GUTS surveys ask about frequency of behaviors in the past year, and after 2001 the time between data collection spanned more than 1 year. We cannot be certain that EDs lasted the full period between waves and present the number of survey years in which ED symptoms were reported rather than imply continuous duration. Our study population was all female and over 90% white; thus, findings may not generalize to more diverse racial and ethnic populations or to males. In prior research, we found that very few males have AN, BN, or PD, and that the male presentation of PD involves high shape and weight concerns coupled with the use of potentially harmful products to increase size and strength [40]. Given gender differences in the disorders of interest, we plan future analyses investigating stability and crossover of disordered eating in males as an important next step in understanding application of diagnostic criteria by gender. We also do not know how many or which individuals received treatment, which may impact interpretations of the probability of symptom resolution. Our findings may also be limited by loss to follow-up. However, we used imputation methods to examine the sensitivity of transition analyses to missing data

and confirmed patterns similar to our main transition results across five imputed data sets. Symptomatic behaviors were related to drop out, and we observed diagnostic stability in a greater proportion of participants when using imputed data. It is possible that results without imputation underestimate disease burden over time. These findings emphasize the importance of addressing missing data to accurately describe ED course, particularly in longitudinal community surveys where attrition is common. We were only able to assess symptoms of AN for a subset of survey years and did not differentiate between AN subtypes. However, given the very low prevalence and crossover rates for AN, we likely would not have sufficient numbers for meaningful comparison by subtype.

There are many strengths of this study, including the size and geographic diversity of our study population, with up to 11 ED symptom assessments collected over 17 years. We were able to evaluate a range of EDs defined by different levels of symptomatic frequency, with more finely grained differentiation than has been presented in much of the existing literature. Further, we followed this cohort through their teenage years and their twenties. Previous studies found that prevalence of BED and PD is highest in the early twenties [1]; by having data on these disorders over 17 years, we were able to capture information on the course of illness that is likely missed by studies with shorter duration or a focus only on adolescents or adults.

A substantial number of ED cases experienced diagnostic transition; of those who crossed over, it was most often a one-time occurrence. Our finding for transitions between BN and PD and between sub- and full threshold presentations suggest that changes in type and frequency of bulimic behaviors are an important feature of ED course. A continuum or staging approach to classification that incorporates such trajectories may be beneficial to researchers and clinicians.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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IMPLICATIONS AND CONTRIBUTION

Studying fluctuation in bingeing/purging behaviors among adolescents clarifies eating disorder course during ages of peak incidence; most research has evaluated treatment-seeking samples, limiting generalizability. This study documents transition between eating disorder phenotypes among one-quarter of symptomatic adolescent and suggests the utility of staged eating disorder classification.

Table 1

Characteristics at baseline of adolescent and young adult female participants, full sample and participants who answered at least three consecutive surveys from 1996 to 2013

Characteristic	Mean (SD) or n (%)	
	Full sample (n = 9,031)	**Answered at least 3 consecutive surveys (n = 8,210)**
Age, mean (SD) (years)	11.59 (SD = 1.64)	11.55 (SD = 1.63) ***
Weight status, n (%)		
Overweight	1,338 (15.05)	1,210 (14.96)
Obese	337 (3.79)	302 (3.73)
Underweight	757 (8.51)	700 (8.65)
Bingeing and purging behaviors, n (%)		
Binge eat, at least weekly, with loss of control	81 (.90)	65 (.80) ***
Binge eat, at least monthly, with loss of control	173 (1.93)	140 (1.72) **
Purge, at least weekly	52 (.58)	43 (.53) **
Purge, at least monthly	107 (1.19)	89 (1.09) *
High levels of shape/weight concerns, n(%)	849 (9.41)	742 (9.04) ***
Eating disorder classification, n (%)		
Full variant		
AN	15 (.20)	13 (.20)
BN	9 (.10)	6 (.07) *
BED	67 (.75)	54 (.67) **
PD	41 (.46)	36 (.44) **
Subthreshold variant		
Sub-BN	10 (.11)	8 (.10)
Sub-BED	86 (.96)	71 (.88) **
Sub-PD	47 (.53)	39 (.48)

AN = anorexia nervosa; BED = purging disorder; BN = bulimia nervosa; PD = purging disorder; SD = standard deviation; sub-BED = subthreshold binge eating disorder; sub-BN = subthreshold bulimia nervosa; sub-PD = subthreshold purging disorder.

* Difference between samples significant at $p < .05$.

** Significant at $p \leq .01$.

*** Significant at $p < .001$.

Table 2

Age-specific prevalence (n [%]) of bulimia nervosa, binge eating disorder, and purging disorder among 9,031 adolescent and young adult females, 1996−2013

Age group	AN[a]	BN	BED	PD
9–12	13 (.2)	1 (.0)	40 (.7)	21 (.4)
13–15	40 (.5)	24 (.3)	110 (1.4)	148 (1.9)
16–18	52 (.7)	63 (.9)	163 (2.4)	170 (2.5)
19–22	44 (.6)	74 (1.1)	208 (3.2)	165 (2.5)
23–27	11 (.3)	48 (.8)	120 (1.9)	154 (2.5)
28+	0 (.0)	12 (.4)	39 (1.3)	40 (1.3)
Study lifetime	145 (1.6)	186 (2.1)	555 (6.1)	563 (6.2)

AN = anorexia nervosa; BED = binge eating disorder; BN = bulimia nervosa; PD = purging disorder.

[a]Prevalence of AN is for surveys from 1996 to 2007.

Table 3

Number of survey years with reported ED symptoms among 8,210 participants who responded to at least three consecutive surveys, 1996–2013

Eating disorder	Prevalence n (%)	Total number of years symptomatic across follow-up,[a] n (% of females with disorder)					Consecutive number of years symptomatic, n (% of females with disorder)		
		1	2	3	4	5+	1	2	3+
BN	182 (2.2)	131 (72.0)	32 (17.6)	12 (6.6)	6 (3.3)	1 (.5)	138 (75.8)	34 (18.7)	10 (5.5)
BED	524 (6.4)	382 (72.9)	86 (16.4)	37 (7.1)	14 (2.7)	5 (1.0)	437 (83.4)	63 (12.0)	24 (4.6)
PD	544 (6.6)	387 (71.1)	105 (19.3)	29 (5.3)	15 (2.8)	8 (1.5)	440 (80.9)	79 (14.5)	25 (4.6)
Sub-BN	308 (3.8)	236 (76.6)	61 (19.8)	7 (2.3)	2 (.6)	2 (.6)			
Sub-BED	1,066 (13.0)	743 (69.7)	216 (20.3)	73 (6.8)	21 (2.0)	13 (1.2)			
Sub-PD	700 (8.5)	520 (74.3)	126 (18.0)	39 (5.6)	13 (1.9)	2 (.3)			
Any full disorder	1,097 (13.4)	691 (63.0)	242 (22.1)	91 (8.3)	40 (3.6)	33 (3.0)			
Any full or subthreshold disorder[b]	2,190 (26.7)	1,037 (47.4)	527 (24.1)	286 (13.1)	139 (6.3)	201 (9.2)			
Baseline age									
9–12	1,448 (17.6)	709 (49.0)	352 (24.3)	192 (13.3)	89 (6.1)	106 (7.3)			
13–15	742 (9.0)	328 (44.2)	175 (23.6)	94 (12.7)	50 (6.7)	95 (12.8)			

BED = binge eating disorder; BN = bulimia nervosa; ED = eating disorder; PD = purging disorder; sub-BED = subthreshold binge eating disorder; sub-BN = subthreshold bulimia nervosa; sub-PD = subthreshold purging disorder.

[a] Individuals who remit and relapse in subsequent survey years.

[b] Full criteria and subthreshold cases of BN, BED, PD, sub-BN, sub-BED, and sub-PD.

Table 4

Transition between eating disorder classifications among 9,031 adolescent and young adult females, 1996–2013

Preceding classification[a]	Study lifetime prevalence (n, % of sample)	Subsequent classification, n (% of preceding classification)								
			Full threshold diagnoses			OSFED categories				
		None[b]	BN	BED	PD	Sub-BN	Sub-BED	Sub-PD[c]	Fluctuation (crossed, returned, crossed again)[d]	Nonresponse[e]
BN	186 (2.1)	53 (28.5)	17 (9.1)	11 (5.9)	24 (12.9)	26 (14.0)	6 (3.2)	8 (4.3)	5 (2.7)	36 (19.4)
BED	555 (6.1)	250 (45.0)	10 (1.8)	56 (10.1)	4 (.7)	17 (3.1)	108 (19.5)	7 (1.3)	4 (.7)	99 (17.8)
PD	563 (6.2)	204 (36.2)	27 (4.8)	5 (.9)	74 (13.1)	25 (4.4)	9 (1.6)	101 (17.9)	5 (.9)	113 (20.1)
Sub-BN	323 (3.6)	110 (34.1)	25 (7.7)	18 (5.6)	23 (7.1)	23 (7.1)	29 (9.0)	25 (7.7)	5 (1.5)	65 (20.1)
Sub-BED	1,103 (12.2)	605 (54.9)	10 (.9)	115 (10.4)	13 (1.2)	38 (3.4)	129 (11.7)	23 (2.1)	3 (.3)	167 (15.1)
Sub-PD	720 (8.0)	364 (50.6)	11 (1.5)	9 (1.3)	64 (8.9)	29 (4.0)	15 (2.1)	78 (10.8)	3 (.4)	147 (20.4)

BED = binge eating disorder; BN = bulimia nervosa; PD = purging disorder; sub-BED = subthreshold binge eating disorder; sub-BN = subthreshold bulimia nervosa; sub-PD = subthreshold purging disorder.

[a] Participants can be included in multiple rows if they transitioned from different disorders over the study period, for example moving from PD (preceding classification) to BN (subsequent), and then from BN (new preceding) to BED (subsequent). Fluctuation back and forth from a given disorder is captured in the column titled “Fluctuation” (see *footnote e*).

[b] Individuals who did not report symptoms of any ED in the subsequent year and also did not relapse with the same ED and report consecutive years of symptoms.

[c] OSFED does not specify symptomatic cutoffs for purging disorder, but separate full and subthreshold variants were examined to further disaggregate OSFED cases and document stability and transition with different thresholds for diagnosis.

[d] Individuals who fluctuated back and forth from a given ED to other diagnoses.

[e] Individuals who cannot be categorized otherwise due to report of ED symptoms in 1 year and subsequent survey nonresponse. These individuals did not have complete ED data across any two survey waves and therefore could not be categorized into a given trajectory.