

UCSF

UC San Francisco Previously Published Works

Title

Care utilization in eating disorders: for whom are multiple episodes of care more likely?

Permalink

<https://escholarship.org/uc/item/5x1215d7>

Journal

Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity, 27(8)

ISSN

1124-4909

Authors

Gorrell, Sasha

Le Grange, Daniel

Blalock, Dan V

et al.

Publication Date

2022-12-01

DOI

10.1007/s40519-022-01491-7

Peer reviewed



Published in final edited form as:

*Eat Weight Disord.* 2022 December ; 27(8): 3543–3551. doi:10.1007/s40519-022-01491-7.

## Care utilization in eating disorders: for whom are multiple episodes of care more likely?

Sasha Gorrell, PhD<sup>1</sup>, Daniel Le Grange, PhD, FAED<sup>1,2</sup>, Dan V. Blalock, PhD<sup>3,4</sup>, Valerie Hutchinson, BS<sup>5</sup>, Madelyn Johnson, BS<sup>1</sup>, Alan Duffy, MS<sup>5</sup>, Philip S. Mehler, MD, CEDS, FACP, FAED<sup>5,6,7</sup>, Craig Johnson, PhD, CEDS, FAED<sup>5</sup>, Jamie Manwaring, PhD<sup>5,6</sup>, Susan McClanahan, PhD, CEDS<sup>5</sup>, Renee D. Rienecke, PhD, FAED<sup>5,8</sup>

<sup>1</sup>Department of Psychiatry and Behavioral Sciences, University of California, San Francisco, San Francisco, CA, USA

<sup>2</sup>Department of Psychiatry & Behavioral Neuroscience, The University of Chicago, Chicago, IL, USA (Emeritus)

<sup>3</sup>Center of Innovation to Accelerate Discovery and Practice Transformation, Durham Veterans Affairs Medical Center, Durham, NC, USA

<sup>4</sup>Department of Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC, USA

<sup>5</sup>Eating Recovery Center/Pathlight Mood & Anxiety Center, USA

<sup>6</sup>ACUTE Center for Eating Disorders at Denver Health, Denver, CO, USA

<sup>7</sup>University of Colorado School of Medicine, Denver, CO, USA

<sup>8</sup>Department of Psychiatry and Behavioral Sciences, Northwestern University, Chicago, IL, USA

### Abstract

**Purpose:** The current study aimed to determine baseline clinical features among adults receiving varied levels of care for transdiagnostic eating disorders ( $N = 5206$ , 89.9% female, mean age 29 years old) that may be associated with increased care utilization.

---

*Correspondence to:* Sasha Gorrell, PhD; Department of Psychiatry and Behavioral Sciences, University of California, San Francisco, 675 18<sup>th</sup> St., San Francisco, CA 94143. Sasha.Gorrell@ucsf.edu.

**Author contributions:** The study idea was conceived by RR, SG, and DLG. SG drafted the manuscript and all authors critically revised the work.

**Conflicts of interest/Competing interests:** Dr. Le Grange receives royalties from Guilford Press and Routledge, is co-director of the Training Institute for Child and Adolescent Eating Disorders, LLC., and a member of Equip Health Clinical Advisory Board. Dr. Blalock receives consulting fees from Eating Recovery Center. Dr. Rienecke receives consulting fees from the Training Institute for Child and Adolescent Eating Disorders, LLC, and royalties from Routledge. All authors report no other biomedical financial interests or potential conflicts of interest.

**Ethics approval:** This study was granted exemption from review by the Sterling Institutional Review Board.

**Consent to participate:** All participants consented to have their data included in research. studies.

**Consent to publish:** All participants consented to have their data published, as indicated.

Level of Evidence

**Level III:** Evidence obtained from well-designed cohort or case-control analytic studies

**Methods:** We used negative binomial regression models to evaluate associations among eating disorder diagnoses, other psychiatric features (e.g., lifetime history of comorbid disorders), and the number of episodes of care for treatment of the eating disorder.

**Results:** Having a diagnosis of binge eating disorder ( $p < .001$ ) or avoidant restrictive food intake disorder ( $p = .04$ ) were associated with lower odds of readmissions. A lifetime diagnosis of major depressive disorder ( $p < .001$ ) or self-injury ( $p < .001$ ) were each associated with significantly higher odds of readmissions.

**Conclusions:** Care utilization may differ according to eating disorder diagnosis, with a likelihood of increased readmission for those with a history of mood disorder or self-injury. Identification of individuals with greater vulnerability for eating disorder care utilization holds potential in aiding treatment and discharge planning, and development.

### Keywords

Care utilization; transdiagnostic eating disorders; binge eating disorder; major depressive disorder; self-injury

---

### Introduction

Eating disorders (ED) are profoundly dangerous psychiatric disorders that affect millions of individuals worldwide regardless of race, age, nationality, or sex [1], and significantly impair physical health and psychosocial functioning [2]. Given their medical acuity, individuals with EDs constitute a high-priority clinical population where illness duration extends to over 20 years for nearly half of those afflicted [3] and many patients require protracted and costly treatment [4]. Across the time course of illness presentation, individuals with EDs often require more than one admission to a treatment setting [5], [6], with high risk for relapse within a short time course following discharge [7], [8]. Repeated episodes of care typically reflect less successful attempts at treatment and subsequently, a longer duration of illness.

Protracted treatment for EDs results in greater disruption in the lives of the identified patient and that of their families, and yields personal and societal costs that are comparable to, or higher than, other significant mental illnesses (e.g., schizophrenia) [4], [9]. Identifying subgroups in which greater ED care utilization is more likely would help to determine prudent resource allocation in treatment and discharge planning, and development, and optimize support for those more vulnerable to the personal, familial, and societal costs associated with frequent ED treatment.

In the United States, treatment for adult EDs typically comprises voluntary attendance in outpatient specialty psychotherapy within a fee-for-services system that private insurance may cover. Outpatient care is offered by mental health providers who provide services in the community or by way of affiliation with any one of many academic treatment centers or for-profit facilities. As a part of these academic or for-profit treatment facilities, more intensive treatment services may be available in higher levels of care, and are typically advised only when clinically indicated. Study of treatment utilization indicates that higher levels of care tend to have a disproportionate number of individuals who are underweight with restrictive EDs. In particular, those with anorexia nervosa may incur more overall health

system cost in inpatient (IP) care as a result of low weight [10], [11], and require follow-up intensive outpatient (IOP) treatment [12]. Among those with anorexia or bulimia nervosa, Keel and colleagues found that increased treatment utilization, defined in their sample as the number of weeks of treatment during a specific follow-up time period, has been associated with a lifetime history of mood disorders, ED severity, poor global functioning, and a comorbid personality disorder [13]. In this study, lifetime history of substance use or an anxiety disorder did not increase the likelihood of greater care utilization [13]. Other identified post-remission predictors of relapse for patients with anorexia nervosa across both restricting and binge-eating/purging subtypes, and bulimia nervosa (indicating a potential need for readmission to care) include residual body image disturbance, and for bulimia nervosa, worse psychosocial function [14]. In transdiagnostic ED samples, recent literature has focused on other patient-level factors that may impact treatment course and outcome, including medical conditions [15], and psychiatric comorbidities including post-traumatic stress disorder [16], [17] and obsessive-compulsive disorder [18].

A majority of health services research in EDs has focused on anorexia nervosa [19], [20], and to a lesser extent, bulimia nervosa [13]. Overall, less is known about clinical characteristics of individuals across DSM-5 ED diagnoses for whom increased care utilization might be more likely. Although as we have highlighted just above, considerable literature exists regarding clinical factors that impact adult ED treatment response (e.g., [21], [22]), less focus has consistently been placed specifically on ED care utilization. Improving our understanding of who may be using systems of ED care more extensively has the potential to improve access to care for those who may need it most, and to inform allocation of resources. Therefore, the current study aimed to determine baseline features that may be associated with increased likelihood of care utilization across multiple levels of care in a large sample of adults with EDs (mean age 29 years old). We focused on the total number of admissions as our outcome of interest (i.e., those for whom one episode of treatment was insufficient). We expected to find that those with a diagnosis of anorexia nervosa would be more likely to require more episodes of care than other ED diagnoses. We also hypothesized that those with lifetime comorbid diagnoses would be more likely to require more episodes of care, compared to those with no lifetime history of comorbidity. Identifying subgroups within an adult ED population who might benefit from more targeted services (e.g., an intensive track within standard care) may inform future treatment and discharge planning, and ultimately prevention of increased treatment utilization.

## Methods

### Participants and procedure

Data analyses were conducted using a study population comprised of all treatment-seeking male and female-identifying adults ( $N = 5206$ ) with a DSM-5 ED diagnosis who were admitted to an ED treatment center for more than one day of treatment between December 2016-December 2019. In 2019, the program consisted of 21 adult ED treatment facilities in the United States, offering five levels of care: outpatient (OP,  $n = 5$ ), IOP ( $n = 18$ ), partial hospitalization (PHP,  $n = 18$ ), residential (RES,  $n = 7$ ), and IP ( $n = 3$ ). In IOP, patients are in treatment up to four days per week for up to nine hours per week; in PHP, patients receive a

full day of treatment for all seven days of the week. In each, patients participate in various types of therapeutic programming, and receive support for snacks and meals. In RES, patients receive 24-hour support in their recovery, but do not require the same monitoring for medical instability as those admitted to IP services. While each of the treatment centers is similar in their overall treatment approach and system-wide standards of conduct, there is some site-specific variability in which evidence-based treatment(s) are primarily provided (e.g., whether an Acceptance and Commitment Therapy-based approach is prioritized versus a Radically Open Dialectical Behavioral Therapy or Family-Based Treatment approach). Although the duration of treatment at any given level of care is highly variable and tailored to the patient, most individuals are ideally expected to spend approximately three weeks (or less) in IP, and 5–6 weeks in RES and PHP, respectively. All patients in IP, RES, and PHP are able to access integrated psychiatric and medical care; individuals who participate in IOP or OP services have access to referral for these services, as indicated.

According to standard intake assessment procedures, patients provided clinical and demographic information to center staff at treatment entry. In this study, readmission was considered any return to treatment after any amount of time away post discharge. The data comprising this study were granted exemption from review by the Sterling Institutional Review Board.

## Measures

**Diagnosis and psychiatric history.**—Clinical Assessment Specialists conducted semi-structured interviews that queried basic demographics, psychiatric and medical history, and ED and other mental health symptoms. These specialist assessors are Masters level clinicians, either fully licensed or working toward their licensure. The semi-structured interviews that were used to assess both symptom presentation and determine diagnoses comprise a standardized assessment used across the treatment facility. When ED or other comorbid psychiatric symptoms were endorsed, the clinician obtained further details to aid in establishing a diagnosis, according to DSM-5 criteria [2]. For example, if depressive symptoms were present, the assessor would query the patient further based on DSM-5 criteria and determine whether the patient met criteria for Major Depressive Disorder (MDD). The assessor would also query whether the individual had ever engaged in any self-harm, and would gather further detail as to the timing and type of behavior, as indicated. In these data, anorexia nervosa is not differentiated between subtypes (i.e., includes both restriction and binge eating/purging subtypes); in addition, the diagnosis of other specified feeding and eating disorder (OSFED) includes atypical anorexia nervosa. Categorization of a mental health disorder (e.g., MDD) or self-injury refers to any lifetime history of this presentation, including current.

**BMI.**—Height and weight were measured by staff at admission to treatment, from which BMI was calculated (kg/m<sup>2</sup>).

## Analytic Plan

Means, standard deviations, and frequencies were calculated for demographic and diagnostic variables. Based on the skew of our continuous outcome of number of admissions, we

electd to use a negative binomial distribution, recoding admission = 1 to zero. Two negative binomial regression models were used to evaluate associations between clinical variables of interest and the number of admissions; both models used a log link function. We entered level of care (IP, RES, PHP, IOP, OP; OP was considered the reference group), age, race (White = 0; non-White = 1), gender (female = 0; male = 1; other gender = 2) and BMI as covariates in each model. In the first regression model, we used effects coding to evaluate associations among five ED diagnoses (anorexia nervosa; avoidant/restrictive food intake disorder [ARFID]; binge eating disorder; bulimia nervosa; OSFED) and the total number of admissions as compared to the average total number of admissions. In the second regression model, we evaluated associations among clinical variables (lifetime diagnosis of any anxiety disorder, MDD, obsessive-compulsive disorder, or substance use disorder [excluding nicotine use disorder]; trauma history; history of self-injury) and the total number of admissions. We conducted collinearity diagnostics, and no variables demonstrated elevated multicollinearity (i.e., all Variance Inflation Factors < 5). Significance was set at  $p < .05$  and SPSS v.27 was used for all analyses.

## Results

### Sample characteristics and preliminary analyses

Descriptive statistics are available in Table 1. The total number of admissions ranged from 1–16;  $M(SD)=1.53(1.22)$ . In this sample,  $n=3760$  had one admission (72.2%),  $n=834$  (16.0%) had two admissions, and  $n=612$  (11.8%) had three or more. For the full sample, age ranged from 18–71 years,  $M(SD)=29.10(11.34)$ , with a BMI range of 10.72–90.82,  $M(SD)=24.99(10.81)$ . A majority of the sample was female-identifying (90%), and White (83%).

### Negative binomial regression

#### **Model 1: Associations among ED diagnoses with total number of admissions**

—Compared to the average number of admissions, diagnosis of binge eating disorder was associated with lower odds of more admissions,  $B = -0.76$ ,  $SE=0.24$ , Wald  $\chi^2=10.04$ ,  $p=.002$ , OR[95% CI] =0.47[0.29,0.75] (Table 2). Those with ARFID also demonstrated decreased odds of more admissions,  $B = -0.52$ ,  $SE=0.25$ , Wald  $\chi^2=4.24$ ,  $p=.04$ , OR[95% CI] =0.60[0.36,0.98]. BMI was a significant covariate ( $p = .005$ ), such that those with higher BMI showed higher odds of increased admissions. Other significant covariates included gender ( $p = .03$ ) and race ( $p = .03$ ), such that males and individuals who identified as non-White showed lower odds of more admissions compared to females or White- identifying individuals, respectively. Level of care also showed significant effects such that compared to individuals in OP care, those in RES ( $p < .001$ ), PHP ( $p < .001$ ), or IOP ( $p < .001$ ), showed lower odds of a higher number of admissions.

#### **Model 2: Associations among clinical features with total number of admissions**

—Having a lifetime diagnosis of MDD,  $B=0.159$ ,  $SE=0.048$ , Wald  $\chi^2=11.16$ ,  $p < .001$ , OR[95% CI]=1.17[1.07,1.29], or a lifetime experience in self-injury,  $B=0.482$ ,  $SE=0.047$ , Wald  $\chi^2=103.20$ ,  $p < .001$ , OR[95% CI]=1.62[1.48,1.78], were each associated with significantly higher odds of more admissions. In contrast, lifetime history of substance

use was associated with lower odds of more admissions,  $B = -0.113$ ,  $SE = 0.046$ , Wald  $\chi^2 = 6.11$ ,  $p = .01$ , OR[95% CI] = 0.89 [0.82, 0.98]. BMI was a significant covariate ( $p < .001$ ), such that those with higher BMI showed lower odds of increased admissions. Other significant covariates included race ( $p = .047$ ), such that those who identified as non-White showed lower odds of more admissions compared to White-identifying individuals. As in Model 1, level of care also showed significant effects such that compared to individuals in OP care, those in RES ( $p < .001$ ), PHP ( $p < .001$ ), or IOP ( $p < .001$ ), showed lower odds of a higher number of admissions.

## Discussion

This study examined baseline characteristics of those with transdiagnostic DSM-5 EDs in an effort to identify clinical features that suggest a likelihood of requiring a greater number of episodes of care. As a high-priority clinical population, investigation of factors that would reduce care utilization among individuals diagnosed with EDs is important to guide future treatment and discharge planning. Overall, a majority of patients received one episode of care.

Our finding that those with ARFID or binge eating disorder were significantly *less* likely to receive greater episodes of care reflects findings from prior work [23], [24], including indications of limited specialty treatment among those with these disorders. Although binge eating disorder is the most common ED diagnosis among adults [2], [25], it is less often diagnosed within primary care settings or referred to ED specialty treatment if indicated [26]. Further, a review of ED-treatment seeking in the community suggested that those with binge eating disorder are more likely to receive treatment for a perceived problem with weight than for ED pathology [27]. Our findings may also reflect lower patterns of reimbursement by United States insurance companies for binge eating disorder; our data derive from a population who primarily rely on commercial insurance to support their treatment, which may naturally correlate with treatment utilization. In a healthcare system such as in the United States, where higher levels of ED care comprise a for-profit industry, decisions that are made regarding who is referred to treatment or when treatment is covered by commercial insurance may reflect financial incentives that lie alongside clinical judgment [28]. Individuals with ARFID were also less likely to be readmitted; ARFID is a comparatively newer diagnosis, gaining formal entry to the diagnostic nosology in 2013 [2] and it is possible that standard treatment centers do not serve the specific needs of individuals with ARFID as effectively. Specifically, higher-level-of-care treatment settings in the United States often comprise group-based programming; compared to individuals diagnosed with EDs characterized by weight and shape concerns, individuals diagnosed with ARFID who do not typically endorse a fear of weight gain may find that a transdiagnostic therapeutic milieu for EDs (where emphasis may be placed on challenging weight and shape concerns) is less beneficial.

A lifetime history of comorbid MDD or self-injury evidenced a significantly greater number of readmissions. Given that greater dysregulation in mood has been implicated in moderating ED treatment success for adolescents and young adults [29], our work aligns with prior study of the impact of other types of psychiatric comorbidity on ED treatment



[16]–[18], and associated lower overall global functioning on ED treatment response, relapse and related care utilization [13], [14]. Similarly, self-injury is associated with increased psychiatric comorbidity [30] and in alignment with our findings, has been shown in prior work to add complexity to ED treatment [31]. Our findings suggest that a lifetime history of substance use disorder and greater care utilization were significantly negatively associated, which was surprising given evidence that comorbidity of eating and substance use disorders can lead to poorer prognosis [32]. It is possible that our findings can be explained by the fact that the comorbidity of substance use in our sample was not necessarily current or that individuals with primary comorbid substance use were referred to specialty care in another treatment setting.

Significant effects were demonstrated for level-of-care covariates in both Model 1 (associations among ED diagnoses with total number of admissions) and Model 2 (associations among clinical features with total number of admissions) such that compared to OP, all higher levels of care except for IP (i.e., RES, PHP and IOP) were significantly associated with less care utilization. Less work has studied the efficacy of higher levels of care [33]; while it could be the case that individuals are improving such that readmission is not necessary, further investigation of outcomes in intensive treatment settings is needed [28]. In both models, males evidenced a lower number of readmissions compared to females; this association was significant in Model 1, which aligns with evidence from prior work that suggests males are less likely to seek treatment due to factors related to stigma [34]. Also in both models, the covariate of race was significant, such that those who identified as non-White had lower odds of readmission; this statistical effect may reflect the comparative rates of White (83%) to non-White (17%) participants. In Model 1, higher BMI was associated with higher odds of readmission, whereas in Model 2, higher BMI was associated with a lower number of readmissions. This difference may reflect a statistical suppression effect in Model 1, resulting from simultaneously entering ED diagnoses and BMI which are likely to share some of the same variance.

A strength of the current study is the large sample size and subsequent provision of adequate representation of transdiagnostic EDs. Further, the data represent clinical presentations across gender identity, and can generalize across geographic locations in the United States. Although health care services are delivered within this privatized system in a manner that may limit generalizability across the globe, harmonizing international standards of care is an important effort for our field as a whole. Towards that end, this study contributes important knowledge about for whom and why increased ED treatment resources may be indicated, findings that are not unique to any specific healthcare system. However, there are a few limitations that we note. For one, our sample is limited by the lack of specificity in whether a comorbid diagnosis was current (i.e., only delineated as lifetime history) and without the use of a standardized measure, clinician variability in conducting diagnostic interviews might have contributed to over- or under-representation in diagnosis. We also did not have the ability to assess duration of illness (or changes in the course of previous diagnoses) or the presence of personality disorders, which prior work suggests may contribute to increased care utilization [13], [21], [35]. In addition, in light of prior work demonstrating the risk for relapse within the first two months following discharge from an acute ED treatment setting [8], future work might include examination of the timing



and frequency of readmission within certain time frames, which may help to guide future resource allocation. To this point, we have considered that readmission broadly represents an extension of illness, with associated negative sequelae. However, we might just as readily consider that readmission represents a willingness to engage in continued treatment in the context of a largely pernicious illness [36]. In this way, increased use of qualitative measures in future study might be used to more effectively query the motivation for readmission, and how reasons for readmission may reflect recovery orientation, treatment challenges, and/or barriers related to the health system.

For some patients, *any* readmission (i.e., two-plus admissions) may symbolize a perceived “failure” on the part of the patient or the treatment itself, and can begin to pave the way towards a more chronic and comparatively hopeless course of illness. In this way, while such a question lies outside the scope of the current paper, a separate inquiry may examine whether there are meaningful differences between those who had two admissions, or three admissions, or between those who had three admissions or 16, as was the upper range in the current study.

Considering our findings from a broader health services perspective, we underscore that the reasons for enabling enrollment in treatment – especially for patients who may have already had multiple admissions - may reflect decisions made by insurance companies, and not necessarily the clinical needs of the patient. Therefore, we cannot assume that all patients who *should* have enrolled in multiple episodes of care were able to. Further, for the current study, we are not able to determine for whom enrollment in treatment was involuntary, which prior work indicates may impact characteristics of treatment [37]. In addition, although we adjusted models for level of care, we did not examine whether readmission was to a higher or lower level, which may provide important clinical implications in future work. Perhaps the most important limitation to note is that while our findings provide suggestions for patterns in the current sample, we cannot comment on whether patients received other care, outside of this specific system.

In summary, at face value, our findings that a majority of individuals with transdiagnostic EDs do not engage in more than one episode of care is largely encouraging. However, several recent editorials have acknowledged that the inadequacy of treatment of EDs in the United States has reached a ‘crisis in care’, and all possible efforts in improving clinical outcomes should be made [7], [38]. We note that an important avenue of future inquiry will be in the comparison of our study findings (specific to privatized insurance) to those of other global healthcare systems. Towards that end, the current study provides a broad examination of diagnostic and clinical features of patients with EDs that may inform treatment planning within a privatized healthcare system. Specifically, our results suggest that a future study might investigate whether more targeted care for mood and emotion-regulation within standard ED care may help to prevent those with a history of MDD and self-injury from needing increased admissions to treatment. Taken together, when considering resource allocation in samples with transdiagnostic EDs, greater support may be needed for those with a history of a mood disorder or self-injury.

## Funding:

This research received no specific grant from any funding agency, commercial or not-for-profit sectors. Dr. Gorrell is supported by the National Institute of Mental Health (K23MH126201). Dr. Blalock is supported by Career Development Award 19-035 (IK2HX003085-01A2) from the United States Department of Veterans Affairs Health Services Research and Development (HSR&D) Service.

## Availability of data and material

Data will be made available upon reasonable request.

## References

- [1]. Schaumberg K et al. , “The science behind the Academy for Eating Disorders’ Nine Truths about Eating Disorders,” *Eur Eat Disord Rev*, vol. 25, no. 6, pp. 432–450, Nov. 2017, doi: 10.1002/erv.2553. [PubMed: 28967161]
- [2]. American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition. American Psychiatric Association, 2013. doi: 10.1176/appi.books.9780890425596.
- [3]. Fichter MM, Quadflieg N, Crosby RD, and Koch S, “Long-term outcome of anorexia nervosa: Results from a large clinical longitudinal study: FICHTER et al.,” *Int J Eat Disord*, vol. 50, no. 9, pp. 1018–1030, Sep. 2017, doi: 10.1002/eat.22736. [PubMed: 28644530]
- [4]. van Hoeken D and Hoek HW, “Review of the burden of eating disorders: mortality, disability, costs, quality of life, and family burden,” *Current Opinion in Psychiatry*, vol. 33, no. 6, pp. 521–527, Nov. 2020, doi: 10.1097/YCO.0000000000000641. [PubMed: 32796186]
- [5]. McIntosh VVW, “Evidence-based treatments remain the best intervention for good long-term outcome of severe and enduring anorexia nervosa,” *Int J Eat Disord*, vol. 53, no. 8, pp. 1322–1323, Aug. 2020, doi: 10.1002/eat.23325. [PubMed: 32621520]
- [6]. Wonderlich SA, Bulik CM, Schmidt U, Steiger H, and Hoek HW, “Severe and enduring anorexia nervosa: Update and observations about the current clinical reality,” *Int J Eat Disord*, vol. 53, no. 8, pp. 1303–1312, Aug. 2020, doi: 10.1002/eat.23283. [PubMed: 32359125]
- [7]. Bulik CM, “From Awareness to Action: An Urgent Call to Address the Inadequacy of Treatment for Anorexia Nervosa,” *AJP*, vol. 178, no. 9, pp. 786–788, Sep. 2021, doi: 10.1176/appi.ajp.2021.21070697.
- [8]. Walsh BT, Xu T, Wang Y, Attia E, and Kaplan AS, “Time Course of Relapse Following Acute Treatment for Anorexia Nervosa,” *AJP*, vol. 178, no. 9, pp. 848–853, Sep. 2021, doi: 10.1176/appi.ajp.2021.21010026.
- [9]. Striegel-Moore RH, Leslie D, Petrelli SA, Garvin V, and Rosenheck RA, “One-year use and cost of inpatient and outpatient services among female and male patients with an eating disorder: evidence from a national database of health insurance claims,” *Int J Eat Disord*, vol. 27, no. 4, pp. 381–389, May 2000, doi: 10.1002/(sici)1098-108x(200005)27:4<381::aid-eat2>3.0.co;2-u. [PubMed: 10744844]
- [10]. Haas L, Stargardt T, Schreyoegg J, Schlösser R, Danzer G, and Klapp BF, “Inpatient costs and predictors of costs in the psychosomatic treatment of anorexia nervosa,” *Int. J. Eat. Disord*, vol. 45, no. 2, pp. 214–221, Mar. 2012, doi: 10.1002/eat.20903. [PubMed: 21374692]
- [11]. Kästner D, Löwe B, Weigel A, Osen B, Voderholzer U, and Gumz A, “Factors influencing the length of hospital stay of patients with anorexia nervosa – results of a prospective multi-center study,” *BMC Health Serv Res*, vol. 18, no. 1, p. 22, Dec. 2018, doi: 10.1186/s12913-017-2800-4. [PubMed: 29334934]
- [12]. Brodrick B, Harper JA, Van Enkevort E, and McAdams CJ, “Treatment Utilization and Medical Problems in a Community Sample of Adult Women With Anorexia Nervosa,” *Front. Psychol*, vol. 10, p. 981, May 2019, doi: 10.3389/fpsyg.2019.00981. [PubMed: 31130898]
- [13]. Keel PK et al. , “Predictors of Treatment Utilization Among Women With Anorexia and Bulimia Nervosa,” *AJP*, vol. 159, no. 1, pp. 140–142, Jan. 2002, doi: 10.1176/appi.ajp.159.1.140.

- [14]. Keel PK, Dorer DJ, Franko DL, Jackson SC, and Herzog DB, "Postremission Predictors of Relapse in Women With Eating Disorders," *AJP*, vol. 162, no. 12, pp. 2263–2268, Dec. 2005, doi: 10.1176/appi.ajp.162.12.2263.
- [15]. Momen NC et al. , "Comorbidity between types of eating disorder and general medical conditions," *Br J Psychiatry*, vol. 220, no. 5, pp. 279–286, May 2022, doi: 10.1192/bjp.2021.104.
- [16]. Ferrell EL, Russin SE, and Flint DD, "Prevalence Estimates of Comorbid Eating Disorders and Posttraumatic Stress Disorder: A Quantitative Synthesis," *Journal of Aggression, Maltreatment & Trauma*, vol. 31, no. 2, pp. 264–282, Feb. 2022, doi: 10.1080/10926771.2020.1832168.
- [17]. Mitchell KS, Scioli ER, Galovski T, Belfer PL, and Cooper Z, "Posttraumatic stress disorder and eating disorders: maintaining mechanisms and treatment targets," *Eating Disorders*, vol. 29, no. 3, pp. 292–306, May 2021, doi: 10.1080/10640266.2020.1869369. [PubMed: 33411646]
- [18]. Drakes DH, Fawcett EJ, Rose JP, Carter-Major JC, and Fawcett JM, "Comorbid obsessive-compulsive disorder in individuals with eating disorders: An epidemiological meta-analysis," *Journal of Psychiatric Research*, vol. 141, pp. 176–191, Sep. 2021, doi: 10.1016/j.jpsychires.2021.06.035. [PubMed: 34216946]
- [19]. Lock J, "A Health Service Perspective on Anorexia Nervosa," *Eating Disorders*, vol. 11, no. 3, pp. 197–207, Sep. 2003, doi: 10.1080/10640260390218648. [PubMed: 16801251]
- [20]. Striegel-Moore RH, "Health services research in anorexia nervosa," *Int. J. Eat. Disord*, vol. 37, no. S1, pp. S31–S34, 2005, doi: 10.1002/eat.20113. [PubMed: 15852316]
- [21]. Vall E and Wade TD, "Predictors of treatment outcome in individuals with eating disorders: A systematic review and meta-analysis: PREDICTORS OF TREATMENT OUTCOME IN INDIVIDUALS WITH EATING DISORDERS," *Int. J. Eat. Disord*, vol. 48, no. 7, pp. 946–971, Nov. 2015, doi: 10.1002/eat.22411. [PubMed: 26171853]
- [22]. the EVHAN Group et al. , "Predictive factors of dropout from inpatient treatment for anorexia nervosa," *BMC Psychiatry*, vol. 16, no. 1, p. 339, Dec. 2016, doi: 10.1186/s12888-016-1010-7. [PubMed: 27716113]
- [23]. Keski-Rahkonen A, "Epidemiology of binge eating disorder: prevalence, course, comorbidity, and risk factors," *Current Opinion in Psychiatry*, vol. 34, no. 6, pp. 525–531, Nov. 2021, doi: 10.1097/YCO.0000000000000750. [PubMed: 34494972]
- [24]. Magel CA, Hewitt K, Dimitropoulos G, von Ranson KM, and McMorris CA, "Who is treating ARFID, and how? The need for training for community clinicians," *Eat Weight Disord*, vol. 26, no. 4, pp. 1279–1280, May 2021, doi: 10.1007/s40519-020-01007-1. [PubMed: 32926345]
- [25]. Udo T and Grilo CM, "Prevalence and Correlates of DSM-5-Defined Eating Disorders in a Nationally Representative Sample of U.S. Adults," *Biol. Psychiatry*, vol. 84, no. 5, pp. 345–354, 01 2018, doi: 10.1016/j.biopsych.2018.03.014. [PubMed: 29859631]
- [26]. Montano CB, Rasgon NL, and Herman BK, "Diagnosing binge eating disorder in a primary care setting," *Postgraduate Medicine*, vol. 128, no. 1, pp. 115–123, Jan. 2016, doi: 10.1080/00325481.2016.1115330. [PubMed: 26592916]
- [27]. Hart LM, Granillo MT, Jorm AF, and Paxton SJ, "Unmet need for treatment in the eating disorders: A systematic review of eating disorder specific treatment seeking among community cases," *Clinical Psychology Review*, vol. 31, no. 5, pp. 727–735, Jul. 2011, doi: 10.1016/j.cpr.2011.03.004. [PubMed: 21501580]
- [28]. Attia E, Blackwood KL, Guarda AS, Marcus MD, and Rothman DJ, "Marketing Residential Treatment Programs for Eating Disorders: A Call for Transparency," *PS*, vol. 67, no. 6, pp. 664–666, Jun. 2016, doi: 10.1176/appi.ps.201500338.
- [29]. Sander J, Moessner M, and Bauer S, "Depression, Anxiety and Eating Disorder-Related Impairment: Moderators in Female Adolescents and Young Adults," *IJERPH*, vol. 18, no. 5, p. 2779, Mar. 2021, doi: 10.3390/ijerph18052779. [PubMed: 33803367]
- [30]. Liu RT, "The epidemiology of non-suicidal self-injury: lifetime prevalence, sociodemographic and clinical correlates, and treatment use in a nationally representative sample of adults in England," *Psychol. Med*, pp. 1–9, May 2021, doi: 10.1017/S003329172100146X.
- [31]. Kiekens G and Claes L, "Non-Suicidal Self-Injury and Eating Disordered Behaviors: An Update on What We Do and Do Not Know," *Curr Psychiatry Rep*, vol. 22, no. 12, p. 68, Dec. 2020, doi: 10.1007/s11920-020-01191-y. [PubMed: 33037934]

- [32]. Harrop EN and Marlatt GA, "The comorbidity of substance use disorders and eating disorders in women: Prevalence, etiology, and treatment," *Addictive Behaviors*, vol. 35, no. 5, pp. 392–398, May 2010, doi: 10.1016/j.addbeh.2009.12.016. [PubMed: 20074863]
- [33]. Anderson LK et al. , "Treating Eating Disorders at Higher Levels of Care: Overview and Challenges," *Curr Psychiatry Rep*, vol. 19, no. 8, p. 48, Aug. 2017, doi: 10.1007/s11920-017-0796-4. [PubMed: 28653117]
- [34]. Griffiths S et al. , "Self-stigma of seeking treatment and being male predict an increased likelihood of having an undiagnosed eating disorder: PREDICTING UNDIAGNOSED EATING DISORDERS," *Int. J. Eat. Disord*, vol. 48, no. 6, pp. 775–778, Sep. 2015, doi: 10.1002/eat.22413. [PubMed: 26052695]
- [35]. Reas DL, Williamson DA, Martin CK, and Zucker NL, "Duration of illness predicts outcome for bulimia nervosa: A long-term follow-up study," *Int. J. Eat. Disord*, vol. 27, no. 4, pp. 428–434, May 2000, doi: 10.1002/(SICI)1098-108X(200005)27:4<428::AID-EAT7>3.0.CO;2-Y. [PubMed: 10744849]
- [36]. Walsh BT, "The Enigmatic Persistence of Anorexia Nervosa," *AJP*, vol. 170, no. 5, pp. 477–484, May 2013, doi: 10.1176/appi.ajp.2012.12081074.
- [37]. Clausen L and Jones A, "A systematic review of the frequency, duration, type and effect of involuntary treatment for people with anorexia nervosa, and an analysis of patient characteristics," *J Eat Disord*, vol. 2, no. 1, p. 29, Dec. 2014, doi: 10.1186/s40337-014-0029-8. [PubMed: 25414793]
- [38]. Kaye WH and Bulik CM, "Treatment of Patients With Anorexia Nervosa in the US—A Crisis in Care," *JAMA Psychiatry*, vol. 78, no. 6, p. 591, Jun. 2021, doi: 10.1001/jamapsychiatry.2020.4796. [PubMed: 33625500]

**Strengths and limits:**

- A strength of the current study is the large sample size and subsequent ability to investigate the research question with adequate representation of transdiagnostic eating pathology, and gender identity.
- Limitations include a lack of specificity in whether a comorbid diagnosis was current (i.e., only delineated as lifetime history), and we also cannot comment on whether patients received other care, outside of the identified system.

**What is already known on this subject:**

- Eating disorders are deadly psychiatric illnesses that may require multiple episodes of care.
- A majority of health services research has focused on individuals with low weight eating disorders such as anorexia nervosa.
- Less is known about certain clinical features that may increase care utilization among individuals with transdiagnostic eating disorders.

**What this study adds:**

- Individuals with binge eating disorder or avoidant restrictive food intake disorder may participate in less care utilization.
- Patients with lifetime history of a mood disorder or self-injury may require a greater number of episodes of care when treating their eating disorder.

**Table 1.**Demographic and descriptive statistics ( $N = 5206$ )

Variable	
	<i>M (SD)</i>
Age (range 18–71)	29.10 (11.34)
BMI (range 10.72–90.82)	24.99 (10.81)
Number of visits (range 1–16)	1.53 (1.22)
	<i>n (%)</i>
<b>Gender identity</b>	
Female	4655 (89.4%)
Male	503 (9.7%)
MTF	27 (.5%)
FTM	21 (.4%)
<b>Race and ethnicity</b>	
American Indian or Alaska Native	4 (.1%)
Asian	152 (2.9%)
Black or African American	128 (2.5%)
Native Hawaiian or Other Pacific Islander	3 (.1%)
White	4332 (83.2%)
Biracial or Multi-racial	223 (4.3%)
Hispanic or Latinx	273 (5.2%)
System missing/declined to answer	91 (1.7%)
<b>Level of Care (admission)</b>	
Outpatient	702 (13.5%)
Intensive outpatient	1300 (25.0%)
Partial hospitalization	1680 (32.3%)
Residential	1423 (27.3%)
Inpatient	54 (1.0%)
System missing	47 (.9%)
<b>Eating disorder diagnosis</b>	
Anorexia nervosa	2159 (41.5%)
ARFID	196 (3.8%)
Binge Eating Disorder	953 (18.3%)
Bulimia nervosa	763 (14.7%)
OSFED	1198 (23.0%)
Rumination or Pica	3 (.1%)

*Note:* MTF = transgender male- to female-identifying; FTM = transgender female- to male-identifying; ARFID = avoidant/restrictive food intake disorder; OSFED = other specified feeding and eating disorder

**Table 2.**

Associations with total number of admissions

Model	Variables	$\chi^2$	<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>p</i>	Exp ( <i>B</i> )	95% CI Exp ( <i>B</i> )
<b>1</b>		385.83				< .001		
	Age		- 0.004	0.002	3.49	.06	0.996	[0.99, 1.00]
	BMI		0.009	0.003	7.73	<b>.005</b>	1.01	[1.00, 1.02]
	LOC							
	IP		0.186	0.187	0.99	.32	1.20	[0.84, 1.74]
	RES		- 0.377	0.069	29.78	< <b>.001</b>	0.69	[0.60, 0.79]
	PHP		- 0.386	0.067	32.90	< <b>.001</b>	0.68	[0.60, 0.78]
	IOP		- 0.822	0.078	111.01	< <b>.001</b>	0.44	[0.38, 0.51]
	Gender							
	Other		- 0.186	0.202	0.848	.36	0.83	[0.56, 1.23]
	Male		- 0.174	0.078	4.99	<b>.03</b>	0.84	[0.72, 0.98]
	Race		- 0.128	0.060	4.53	<b>.03</b>	0.88	[0.78, 0.99]
	AN		0.129	0.23	0.30	.58	1.14	[0.72, 1.80]
	ARFID		- 0.519	0.25	4.24	<b>.04</b>	0.60	[0.36, 0.98]
	BED		- 0.76	0.24	10.04	<b>.002</b>	0.47	[0.29, 0.75]
	BN		- 0.21	0.24	0.76	.38	0.81	[0.51, 1.29]
	OSFED		- 0.05	0.23	0.05	.82	0.95	[0.61, 1.49]
<b>2</b>		433.34				< .001		
	Age		- 0.001	0.002	0.193	.66	0.999	[0.995, 1.00]
	BMI		- 0.01	0.003	22.99	< <b>.001</b>	0.99	[0.98, 0.99]
	LOC							
	IP		0.215	0.191	1.28	.26	1.24	[0.85, 1.80]
	RES		- 0.458	0.070	43.47	< <b>.001</b>	0.63	[0.55, 0.73]
	PHP		- 0.441	0.067	42.73	< <b>.001</b>	0.64	[0.56, 0.74]
	IOP		- 0.854	0.077	121.95	< <b>.001</b>	0.42	[0.37, 0.50]
	Gender							
	Other		- 0.253	0.203	1.56	.21	0.78	[0.52, 1.16]
	Male		- 0.102	0.079	1.66	.20	0.90	[0.77, 1.06]
	Race		- 0.121	0.061	3.96	<b>.047</b>	0.89	[0.79, 1.00]
	MDD		0.159	0.048	11.16	< <b>.001</b>	1.17	[1.07, 1.29]
	Anxiety disorder		0.064	0.054	1.37	.24	1.07	[0.96, 1.19]
	OCD		0.126	0.077	2.67	.10	1.13	[0.98, 1.32]
	Substance use		- 0.113	0.046	6.11	<b>.01</b>	0.89	[0.82, 0.98]
	Trauma history		0.091	0.049	3.45	.06	1.10	[0.995, 1.21]
	Self-injury		0.482	0.047	103.20	< <b>.001</b>	1.62	[1.48, 1.78]

Note: Reference groups refer to those presenting without the given diagnosis (Model 1) or clinical variable (Model 2). For level of care at admission (LOC), outpatient care (OP) serves as the reference group; IP = inpatient, RES = residential, PHP = partial hospitalization, IOP =



intensive outpatient; Gender reference group is female-identifying; Race reference group is White (vs. non-White); AN = anorexia nervosa; ARFID= avoidant/restrictive food intake disorder; BED = Binge Eating Disorder; BN = bulimia nervosa; OSFED = other specified feeding and eating disorder. In Model 2, clinical variables refer to any lifetime or current experience; MDD = major depression; OCD = obsessive-compulsive disorder; substance abuse excludes current nicotine or alcohol use

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript