

2021

Improving binge eating disorder screening in primary care settings

<https://hdl.handle.net/2144/43841>

"Downloaded from OpenBU. Boston University's institutional repository."

BOSTON UNIVERSITY
SCHOOL OF MEDICINE

Thesis

**IMPROVING BINGE EATING DISORDER
SCREENING IN PRIMARY CARE SETTINGS**

by

CHRISTINE FANG

B.A., University of California, Berkeley, 2017

Submitted in partial fulfillment of the
requirements for the degree of
Master of Science

2021

© 2021 by
CHRISTINE FANG
All rights reserved

Approved by

First Reader

Paula A. Quatromoni D.Sc., R.D.
Associate Professor and Chair of Health Sciences
Boston University, Sargent College of Health and Rehabilitation
Sciences
Associate Professor of Epidemiology
Boston University, School of Public Health

Second Reader

John Weinstein, Ph.D., M.S.
Assistant Professor of Medicine
Boston University, School of Medicine

ACKNOWLEDGMENTS

I would like to first thank my thesis advisor Dr. Quatromoni, who was an amazing advisor. Thank you so much for guiding me during this process and always having the time to find the resources I needed. Secondly, I would like to thank Dr. Weinstein for his help and support.

**IMPROVING BINGE EATING DISORDER SCREENING
IN PRIMARY CARE SETTINGS**

CHRISTINE FANG

ABSTRACT

Binge eating disorder (BED) is a condition associated with significant emotional distress. It is characterized by episodes of eating unusually large amounts of food where the individual experiences a loss of control. These episodes are accompanied by negative emotions such as shame or guilt. BED is frequently associated with obesity, which is a stigmatized state in society.

As a newer official diagnosis in the DSM-V, BED is rarely screened for in routine healthcare practice. As the most prevalent eating disorder in the United States and the only one affecting similar proportions of men and women, the lack of screening presents a large gap in healthcare services. Currently, screening for eating disorders, in general, is not standardized and education of healthcare professionals on eating disorders is minimal.

This educational intervention study aims to evaluate the effect of providing education on BED to primary care clinicians along with recommendations for using a standardized screening tool in their practice. Investigators provide an hour-long educational intervention and will track provider practices over three months. At the conclusion of the study, we will compare the proportion of patients screened for BED before and after the intervention. We hypothesize that after the intervention, more providers will be screening for BED. At a minimum, positive findings become a starting

point for further research to identify the educational needs for primary care clinicians on eating disorder diagnoses.

TABLE OF CONTENTS

ACKNOWLEDGMENTS	iv
ABSTRACT.....	v
TABLE OF CONTENTS	vii
LIST OF TABLES	viii
LIST OF ABBREVIATIONS.....	ix
INTRODUCTION.....	1
Background	1
Statement of the Problem.....	2
Hypothesis.....	3
Specific aim and objectives	3
REVIEW OF THE LITERATURE.....	5
Overview.....	5
Existing research on ED training for PCPs.....	20
METHODS	23
CONCLUSION.....	32
Discussion.....	32
Clinical and/or public health significance	33
APPENDIX.....	35
REFERENCES.....	37
CURRICULUM VITAE.....	40

LIST OF TABLES

Table 1: DSM-IV and DSM-V diagnostic Criteria.....	5
Table 2: Classification of Overweight and Obesity by BMI	11
Table 3: Outline of Binge Eating Disorder Lecture	26

LIST OF ABBREVIATIONS

AN	Anorexia Nervosa
BED	Binge Eating Disorder
BEDS-7	Binge Eating Disorder Screener-7
BITE	Bulimic Investigatory Test- Edinburgh
BMC	Boston Medical Center
BMI	Body Mass Index
BN	Bulimia Nervosa
BU	Boston University
CBT	Cognitive Behavioral Therapy
CME	Continuing Medical Education
EDE	Eating Disorder Examination
ED	Eating Disorder
DSM	Diagnostic and Statistical Manual of Mental Disorders
EMR	Electronic Medical Record
IPT	Interpersonal Psychotherapy
NP	Nurse Practitioner
PA	Physician Assistant
PCP	Primary Care Provider
QEWP	Questionnaire of Eating and Weight Patterns
SCID-I	Structured Clinical Interview for DSM Disorders

INTRODUCTION

Background

Binge eating disorder (BED) is the most common eating disorder in the United States, with an overall prevalence of 2.8%.¹ When over 30 million people in the U.S. have been diagnosed with an eating disorder, this statistic signals a major health burden. If left untreated, BED can lead to severe impairments in quality of life.

As an eating disorder diagnosis, BED is relatively new having been officially added to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) in 2013.² In terms of clinical presentation, BED is characterized by episodes of eating where the individual experiences a loss of control over the amount of food eaten in a discrete period of time, typically a 2 hour window. These episodes are accompanied by negative emotions such as shame or guilt. BED is frequently associated with obesity, which is a stigmatized state in society. Weight stigma can further increase the shame that patients feel, preventing them from seeking treatment in spite of distressing symptoms. BED is distinct but shares the binge eating behavior of bulimia nervosa (BN) which is a more established eating disorder diagnosis. Specifically, BED lacks the compensatory behavior (purging, laxative misuse, or excessive exercise) that defines BN.

Like other eating disorders, BED is often accompanied by mental and physical symptoms and comorbidities. Many of the physical complications of BED are associated with the obesity that usually coexists such as diabetes and hypertension.³ In terms of the mental health burden, clients with BED are similar to those with other eating disorder

diagnoses by being at increased risk of having depression, generalized anxiety disorder, panic attacks, and previous suicide attempts.⁴

BED is grossly underdiagnosed and under-treated, which can partially be ascribed as an overlooked responsibility of the medical provider.⁵ Since BED is a newer official disorder in the DSM, information on diagnosis and screening has not been widely disseminated to healthcare providers.⁵ As well, the general public and most patients in primary care lack education and understanding of eating disorders and BED, making it difficult for sufferers to recognize the condition or seek help. Healthcare is not a vacuum, and bias against patients with higher weights exists inside of healthcare.⁵ This is especially crucial to consider since people in larger bodies are more likely to have BED. Not screening or treating this constitutes biased healthcare where the health needs of these individuals are not being addressed. By increasing education around BED and improving screening in primary care, improvements in healthcare delivery for affected individuals can be realized.

Statement of the Problem

More than half of eating disorders are undetected by primary care providers, even though research shows that patients with eating disorders tend to utilize the health care system more than average.^{1,5} Since primary care is the entry portal into the healthcare system for most patients, this constitutes a missed opportunity to screen for and treat BED.

In terms of BED being “unnoticeable” to their PCPs, patients do not always present with obvious nutritional deficiencies. In fact, they may have generally vague

symptoms such as depression or constipation.⁵ Because of the stigmas in healthcare associated with overweight or obese patients, PCPs may not even look for the mental health underpinnings of an eating disorder that may be contributing to weight gain or obesity in affected patients.⁵ Instead, the conversations surrounding weight with these patients are often counterproductive, with PCPs seeing an overweight patient and making false assumptions about their behaviors. With this, they often endorse weight loss and restrictive diets, rather than asking about disordered eating behaviors or the psychosocial stress these patients are under that may trigger the binge eating behavior.⁸

Because BED was only officially recognized as a mental health condition in 2013, it is particularly at risk for being unrecognized and underdiagnosed in primary care settings due to inadequate dissemination of BED criteria information. Few studies have been conducted specifically on increasing screening or on evaluating screening practices for eating disorders among patients in primary care which makes this topic an area of potential research.⁵

Hypothesis

Educating primary care providers about the diagnostic criteria, risk factors, and clinical comorbidities, and screening method for binge eating disorder will lead to increased screening for BED.

Specific Aim and Objectives

The specific aim for this project is to increase screening for BED among primary care providers. We will achieve this aim through the following objectives:

1. Educate internal medicine and family medicine physicians, physician assistants, and nurse practitioners about the criteria for diagnosing binge eating disorder, and the providing recommendations for a screening tool and protocol.
2. Collect data from EMR to document the impact of the educational intervention on BED screening behaviors of primary care providers.

REVIEW OF THE LITERATURE

Overview

Binge eating was first described in the 1950s by Stunkard as a pattern of loss of control during eating episodes where large quantities of food are consumed in a relatively short period of time.⁷ Binge eating disorder was first officially recognized as a discrete eating disorder in 2013 when the DSM-5 was published.⁸ Between the 2013 edition of the DSM compared to the previous, some subtle but important changes were made to the diagnostic criteria that expanded the range of patients who could be clinically important to screen (Table 1).

Table 1: DSM-IV and DSM-V Diagnostic Criteria

Criteria Set	Specific Definitions for Each Criterion
Criterion 1	<p>Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:</p> <ul style="list-style-type: none">a. Eating, in a discrete period of time (e.g., within any 2-hour period), an amount of food that is definitely larger than most people would eat in a similar period of time under similar circumstancesb. The sense of loss of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating)

Criterion 2	<p>Binge-eating episodes are associated with 3 (or more) of the following:</p> <ul style="list-style-type: none"> a. Eating much more rapidly than normal b. Eating until feeling uncomfortably full c. Eating large amounts of food when not feeling physically hungry d. Eating alone because of being embarrassed by how much one is eating e. Feeling disgusted with oneself, depressed, or very guilty after overeating
Criterion 3	Marked distress regarding binge eating is present.
Criterion 4	<p>Binge eating episodes occur:</p> <ul style="list-style-type: none"> a. At least 2 days a week for 6 months (DSM-IV) b. At least 1 day a week for 3 months (DSM-5)
Criterion 5	<p>The binge eating is not associated with the regular use of inappropriate compensatory behavior (e.g., purging, fasting, excessive exercise) and does not occur exclusively during the course of anorexia nervosa or bulimia nervosa.</p>

Severity	DSM-IV does not include a severity scale.
Grading	<p>DSM-5 severity is as follows:</p> <ul style="list-style-type: none"> • Mild: 1 to 3 episodes per week • Moderate: 4 to 7 episodes per week • Severe: 8 to 13 episodes per week • Extreme: 14 or more episodes per week

Adapted from “Management and Outcomes of Binge Eating Disorder”⁹

Demographics

With an average age of onset of 25.4 years, BED primarily affects an older population than most other eating disorders.⁸ However, behaviors and symptoms of binge eating likely begin much earlier, during childhood or adolescence.⁸ Binge eating disorder has the highest prevalence of all eating disorders diagnosed both in the United States and worldwide.¹ With a prevalence of 2-3% in the general U.S. population, it is more common than anorexia nervosa (AN) and bulimia nervosa (BN) combined.¹⁰ BED affects a greater percentage of those with overweight or obesity. In the context of a primary care setting, more than 5% of primary care patients could have underlying BED.¹⁰ This observation aligns with how BED patients tend to utilize the healthcare system more often than the average patient; it also confirms that primary care is an appropriate place to screen.

In terms of population demographics, studies differ on the ethnicities in which BED is reportedly most prevalent. The more commonly recognized eating disorder diagnoses like anorexia and bulimia are most commonly diagnosed in Caucasian women,

though rates are rising in other subgroups. BED tends to affect a more diverse demographic. Some studies show equal levels of BED in Caucasian women and African-American women.⁷ Others report that BED could be more common in people of ethnic minority backgrounds.^{7,11} This can be partially due to disparities in rates of trauma, substance abuse, poverty, and food insecurity in minority populations compared to Caucasians, all of which are risk factors for BED.¹¹ Either way, BED is found to affect a more diverse population in the U.S. than other eating disorders, making it an important condition to screen for across different racial/ethnic populations.

Concerning gender differences, up to 90% of individuals with AN and BN are female.¹² However, the prevalence gap between genders in BED is significantly smaller than in other eating disorders where up to 40% of those diagnosed with BED are male.^{8, 12} Research shows that BED affects an even greater proportion of more specific population subgroups, some 30% of those trying to achieve weight loss and 50% of the obese population.^{3, 13} These realities endorse the universality of the need to screen for BED in primary care.

Association With Weight

BED is often associated with high body weight (measured clinically as body mass index, BMI) and obesity (Table 2), serving as a barrier to its diagnosis. When BED is left untreated, obesity and its associated comorbidities remain salient concerns. One study found that the rate of obesity increased from 22% to 39% during a five-year period in a group of individuals with BED who were untreated.¹⁴ In fact, up to 42.4% of those in one study with BED were found to be overweight and 14.8% of those with BED were

classified in the most severe class of obesity with a BMI greater than 40 kg/m².¹⁵ Because current society is weight-centered and weight-shaming, individuals in larger bodies are often shamed and made to feel guilty about their physical appearance and/or their eating habits, a situation that prevents them from willingly disclosing their concerns and eating behaviors.¹⁵ The negative attitudes of physicians towards these patients do not help in reassuring patients that the office is a safe place to discuss their weight.⁸ Many patients do not even realize that BED is a disorder, or that treatment is available. Of the patients who do end up seeking treatment, many of them gain a substantial amount of weight in the year before, suggesting that rapid weight gain in overweight and obese individuals could indicate underlying BED.¹⁴ When weight-based discrimination exists in healthcare, a BED diagnosis may be delayed or altogether missed by clinicians who fail to fully assess an individual's eating patterns when they present with obesity.¹⁵ One study showed that 56% of clinicians reported overhearing negative comments about patients with obesity from other healthcare providers, demonstrating that these negative biases against persons living in larger bodies exist.¹⁵ In order to effectively diagnose and treat BED, clinicians must evaluate their own personal weight bias and receive specific training in order to work past this bias and provide equitable, inclusive, high quality care to their patients.

Although patients with BED utilize the healthcare system more often than the average individual, they usually seek treatment for weight loss rather than for the eating patterns causing their weight gain.¹³ Studies have found that between 4 to 49% of post-bariatric surgery patients have BED, meaning that it is highly likely these patients ended

up receiving highly invasive surgical interventions for their weight before or rather than fully evaluating, diagnosing and treating an underlying eating disorder.⁸ In order to prevent ineffective or overly invasive treatment interventions, the burden of identifying these at-risk patients lays in the hands of the first line clinicians -- primary care providers. Although obesity is common amongst individuals with BED, it is important to be mindful as a provider that most sufferers of this disorder are not obese. In terms of screening, it is important to understand that BED can present in any patient, regardless of physical appearance or body shape and size.

Physical Comorbidities

Like other eating disorders, BED can present with a wide range of physical and psychiatric comorbidities. The most common physical conditions are related to obesity, such as joint pain, musculoskeletal pain, gastrointestinal problems, shortness of breath, chest pain, and most importantly, metabolic syndrome.¹⁶ Metabolic syndrome is a clustering of at least three physiologic risk factors that occur simultaneously and synergistically increase the risk of coronary heart disease, stroke, and type 2 diabetes. These conditions include hypertension, hyperglycemia, hyperinsulinemia, excess body fat in the abdominal area, and high triglycerides and/or low HDL-cholesterol.

Although many of the BED comorbidities are associated with obesity, the two are distinct health conditions. Patients who live with both BED and obesity have more than twice the risk of having 2 or more components of the metabolic syndrome than their counterparts who are obese without BED.¹⁶ Stress and trauma are major factors in the development of both BED and obesity. The glucocorticoids released during stressful

episodes lead to increased hunger and cravings for sugary and fatty foods.¹⁶ Researchers noted differences between a group with obesity and BED compared to a group with obesity without BED in terms of the physiologic stress response, confirming that BED is distinguishable from obesity.¹⁶ Specifically, the individuals with obesity and BED demonstrated a greater propensity towards sweets, binge episodes, and higher stress vulnerability. An extended follow-up study confirmed these results and also demonstrated increased blood pressure readings, higher rates of depression, and greater perceived stress among individuals who had both obesity and BED.¹⁶

Table 2: Classification of Overweight and Obesity by BMI

	BMI (kg/m ²)	Obesity Class
Underweight	< 18.5	
Normal weight	18.5 - 24.9	
Overweight	25.0-29.9	
Obesity	30.0 - 34.9	I
	35.0 - 39.9	II
Extreme Obesity	> 40	III

Adapted from “Dietary Treatment of Obesity”¹⁷

Psychiatric Comorbidities

BED is also associated with a wide range of mood and substance use disorders. Up to 79% of patients with BED have at least one other psychiatric disorder, including anxiety disorders, mood disorders, impulse-control disorders, and substance use disorders.¹⁵ This is important because the pathology of these comorbid conditions can contribute to and exacerbate BED patterns.¹⁵ Some of the medications used to treat these psychiatric conditions can also increase hunger, even further escalating disordered eating behaviors.¹⁵ This situation deserves consideration when treating these comorbid mental health conditions. Binge eating in general, in both bulimia and binge eating disorder, is associated with use of various substances. Research implies that a history of substance use disorder could indicate a more severe form of BED for affected individuals.¹⁸ BED is also associated with poor social adjustment, heightened overall distress, depression, and suicidality.¹⁵

Risk Factors

Two of the major risk factors for BED include food insecurity and trauma. It is well known that food insecurity is linked to higher rates of obesity.¹⁹ Food insecurity in low-income households has also been associated with cycles of food restriction and overconsumption.¹⁹ This is due, in part, to major fluctuations in meal frequency and size that occur between monthly paychecks or food stamp dispersal. Although this pattern is not enough for a formal BED diagnosis, it is a concerning behavior that is consistent with binge-eating episodes.¹⁹ Trauma at any point in life is also a major risk factor to developing BED. Most studies have focused on the link between child sexual abuse and disordered eating patterns, but all forms of trauma including neglect, physical abuse, and

sexual harassment have been shown to be associated with eating disorders.²⁰ Not only this, but there is also an association between the severity of trauma and the severity of disordered eating psychopathology.²¹ It is believed that binge eating food is a method of inducing a dissociative state to distract from the pain of trauma.²¹

Many of the other risk factors for BED are similar to those for other eating disorders. Patients who suffer from disordered eating in general have been found to be at greater risk for body dissatisfaction and early onset of dieting patterns.⁷

Finally, there have been some links to genetics, since BED tends to aggregate in families.⁷ It is estimated that the heritable rate of BED is 45-57%.⁷ However, it is challenging to disentangle the influence of genetic predisposition from the environmental influence of being raised in a family where other role models exhibit unhealthy relationships with food and body weight. BED has been associated with hypersensitivity to reward, which falls in line with how patients with both BED and obesity have a greater density of Dopamine 2 receptors in the brain as compared to patients with obesity without BED.⁷ Patients with BED and bulimia also tend to have increased volume of grey matter and a stronger activation response in the medial orbitofrontal cortex (a brain region associated with reward) when looking at food.⁷ There are few studies regarding the neurobiological foundation of BED, and the implications of these findings have not been fully investigated.

Screening

The very few studies that assess BED screening in an adult population differ on the rate at which PCPs actually screen for binge eating disorder, but most studies report

low percentages. Of 272 providers surveyed in one study, 41.6% reported never assessing for the presence of binge eating behavior.²² The same study reported that 42.8% of clinicians surveyed believed that BED occurred in fewer than 20% of their obese patients.²² In another study, 10% of 278 PCPs surveyed self-reported they would not screen specifically for eating disorders, even when general symptoms were present.¹ One-third of providers in this study reported that they screened generally for eating behaviors in all of their patients, and two-thirds reported they screened for eating habits in patients with obesity.¹

At present, there is no standardized approach to screening for BED in primary care. Of several available tools, many require clinician-conducted interviews. The Structured Clinical Interview for DSM-IV-TR Axis I Disorders (SCID-1) and the Eating Disorder Examination Questionnaire (EDE) are typically considered the “gold standards” for diagnosing eating disorders in general.^{10,24} However, they both require a highly trained clinician and up to two hours’ time for the entire interview process.²⁴ This would not be feasible in the setting of an office visit of a primary care provider.

In a short office visit, screening is more feasible using a self-administered questionnaire that can be completed in minutes. At present time, there is no one screening tool that is recommended for use. Self-assessments are not without their own set of limitations. One potential caveat with questionnaires relates to the objective versus subjective definition of binge eating.¹ In order to reliably screen for BED, clinicians should provide context for a clinically relevant definition of an “unusually large” amount

of food before the questionnaire is taken.⁸ If not, follow-up questions are needed to accurately evaluate patient responses.

Diagnosis

Just recognizing and attempting to screen for BED is not enough if providers do not understand the criteria for making a BED diagnosis. One study found that fewer than half of primary care providers used the DSM criteria when diagnosing BED.¹ Among a sample of 278 PCPs in one study, 27% of them did not recognize BED to be its own diagnosis.¹ Yet, the role of primary care providers in addressing BED extends past screening and diagnosis. PCPs are responsible for referring patients to the appropriate treatment programs, nutritionists, and eating disorder therapists, and they serve on the multidisciplinary care team. PCPs use motivational interviewing techniques to empower patients to follow through with these referrals. They also monitor and treat the medical comorbidities of BED.⁷ These additional responsibilities mean that PCPs should have more education about how to appropriately screen for BED and lead their patients to treatment.

Treatment

Treatment options are varied for BED. Oftentimes, healthcare providers will manage the comorbidities associated with BED without realizing that there is an underlying eating disorder causing or exacerbating them. Without treating the fundamental eating disorder, managing these negative health consequences is insufficient and often ineffective. Cognitive behavioral therapy (CBT) is the most supported treatment for BED, and uses an established model based on the treatment of bulimia.⁷

This therapy focuses on treating four fundamental characteristics of eating disorders: perfectionism, low self-esteem, mood disturbances and interpersonal difficulties.

Treatment for BED does not focus on weight loss, and instead prioritizes normalizing eating behaviors, establishing a healthy relationship with food and body, and preventing relapse. Interpersonal psychotherapy (IPT) is another treatment method that focuses on four interpersonal areas: interpersonal conflict, grief, role transitions and interpersonal deficits. Few studies have examined IPT for the treatment of BED, but the few that exist show that it is as effective as CBT.⁷ CBT could be used as first line treatment, and IPT reserved for patients with higher psychopathology who do not respond to CBT. As of 2015, there was one FDA approved medication approved for the treatment of BED -- lisdexamfetamine dimesylate -- which has been shown to reduce binge eating episodes.⁷ Other than this, antidepressants and anticonvulsant medications possibly could reduce binge eating frequency, but the research is limited.⁷

There is no agreed upon treatment strategy that prioritizes weight loss in clients with BED, since weight loss programs appear to be ineffective in the long run.¹³ For this reason, treating the co-occurring obesity with conventional weight loss advice risks exacerbating the binge eating disorder and worsening health outcomes. Weight loss has been found to be greatest in patients who refrained from relapsing into binge eating behaviors, meaning that reducing the disordered eating pattern may lead to weight reduction for some patients.^{13, 24}

Recovery

Clinical recovery from an eating disorder is complicated and the current literature is varied in its results, in part because definitions of recovery used in research are not standardized. Eating disorders are chronic mental health conditions with alternating cycles of recovery and relapse that typically repeat over many years' duration. Recovery is an active process that patients engage in, rather than a destination achieved and maintained by most. There is little research on BED recovery given its recent articulation in the DSM. The existing research often focuses on younger female patients who have already undergone eating disorder treatment. These studies show a high rate of spontaneous remission for BED.⁷ However, the studies with populations of older females who are at various stages in their BED treatment show much lower remission rates of 7%.⁷ Nonetheless, even this rate is higher than most eating disorders, which is promising for future research.

Attitudes of Healthcare Providers

Two studies with sample sizes of 122 and 278, respectively, demonstrated through clinician self-report that providers generally believed themselves capable of recognizing BED in clinical practice.^{1,26} In both studies, most primary care providers were able to accurately diagnose the scenario when given clinical vignettes describing patients with BED.^{1,26} Despite this confidence, other evidence based on the amount of time that patients have BED without being diagnosed shows that PCPs struggle with diagnosing patients with BED in actual clinical practice.³ This discrepancy may be attributed to how scoring well on a focused clinical vignette is vastly different from

ascertaining BED in a short office visit with an elusive patient who is ashamed to disclose behaviors.

One of the above studies also found that only 33% of the providers self-reported they would consider screening for eating disorders in all patients, and 68% would consider screening for patients with obesity.¹ This depicts a concerning gap in practice, especially when so many providers place an emphasis on obesity when deciding to screen. The majority of BED patients are not actually obese, so using weight to decide whether or not to screen would lead to underdiagnosis and missed opportunity for treatment.¹ Further, in regards to screening and diagnosis methods, the clinicians' strategies varied. Only 29% reported that they would actually use the full DSM-5 criteria to establish a diagnosis. The rest of the clinician's methods varied from using an eating diary to using something vaguely described as a "clinical history" to using partial DSM-5 criteria.¹ This is problematic since the lack of a standardized approach coupled with PCP biases about body size will present obstacles to patient accessing the care that patients with BED need. With improper screening and inappropriate diagnostic methods combined, patients with BED patients are disadvantage in the healthcare system.

As mentioned, a significant barrier to BED diagnosis is ineffective communication between the provider and the patient. One study recorded office visits with 24 patients with BED; they found that that one of the main causes of miscommunication was the judgment and bias surrounding BED.⁸ Another important source of miscommunication was the primary concern of each party - patients focused on triggers and the emotional aspects of their disorder whereas providers instead focused on

weight and dieting.⁸ As noted, weight loss is not the desired outcome of BED treatment and dieting is not an appropriate intervention strategy. This study identified a few trigger words and phrases that led to ineffectual care because of how providers' phrases were perceived by the patients. Specifically, when providers described binge eating episodes in layman's terms like "overeating," they came across as subjective and judgmental. Focusing on the nutritional value of the food consumed during a binge is not the priority, but providers tended to ask specifically about "junk food" or "sweets" rather than asking more relevant questions like the experience of the loss of control during an episode.

Patient Perspectives

The process of diagnosing eating disorders is currently difficult for both the primary care providers and the patients. One qualitative study included interviews with 25 patients, 11 formally diagnosed and 14 who met DSM-5 criteria for BED but were not formally diagnosed yet.⁵ It is important to note that five (45%) of the eleven diagnosed patients were diagnosed by a healthcare provider.⁵ The other six (55%) became aware of the diagnosis that named their problematic behavior on their own, often by searching the internet. Even with rapid weight gain as a red flag, some of these patients still did not receive information about their eating disorder from their provider. One patient said their doctor advised him/her to *"do some exercise and go walking, but that's where it ends right there."* Both groups of patients in this study reported barriers to communicating with their providers about their symptoms. These barriers varied from person-to-person with the most common being the guilt and embarrassment they experienced when talking about their behavior with their provider. Other complaints included the limited time in an

office visit, perception of their provider not being knowledgeable about BED, and difficulty talking about their symptoms in general.

Among the 25 individuals in this study sample, 15 believed that healthcare providers should be more knowledgeable about BED (60%). Along these lines, seven (28%) patients emphasized the importance of a judgment-free environment where they can discuss their eating behaviors. One frustrated patient reported, *“But when you start gaining weight and doctors just look at you like oh, you need to lose, you should try Weight Watchers or portion control...That is never going to be helpful to anybody that’s trying to get their binge eating disorder in check.”* This quote illustrates how providing advice about losing weight can be detrimental to patients suffering from BED. Based on the patient interviews, this weight-centric advice is perceived as stigmatizing, and can push patients further away from healthcare providers and interventions. Instead, a full assessment of an individual’s eating behavior should be conducted to carefully evaluate the appropriateness of weight loss recommendations. One limitation of this study was its size -- 25 participants constitute a nice sample for a qualitative study, yet the findings should be interpreted cautiously. However, the patients interviewed were more diverse than those included in most other studies and are likely more representative of the patient population with BED. Overall, the responses add to our understanding of the obstacles to quality care by providing the patients’ perspective of the PCP experience.

Existing Research on ED training for PCPs

As of 2014, very few residency programs in the United States included eating disorders as part of their curriculum.²⁶ This, in part, could be due to the lack of a

standardized curriculum for residency programs to follow when providing eating disorder training.²⁶ One study collected data from 637 residency programs (family medicine, internal medicine, pediatrics, psychiatry, child/adolescent psychiatry) across the country.²⁶ Out of these, 514 (80.7%) did not offer any rotations for eating disorders. Among the remainder, only 42 (6.6% of all programs) offered a formal, scheduled rotation on eating disorders to its students. The same researchers also collected data on how many hours each residency specialty offered formal didactic training for eating disorders. They found that internal medicine reported the lowest number of hours at an average of 1.94 hours and family medicine provided an average of 3.55 hours.²⁶ Although this study did not investigate the effectiveness of the eating disorder training (formal or informal), it demonstrates how limited the education is on this topic during residency. This study only focuses on medical students during residency, but since Physician Assistant (PA) and Nurse Practitioner (NP) students rotate and learn under the same departments at most teaching hospitals, it can be assumed that students in these medical professions similarly do not receive formal training in eating disorders detection, diagnosis or treatment.

In summary, there are very few studies providing or evaluating eating disorder training for PCPs in the United States, let alone studies that focus specifically on binge eating disorder. If primary care and other healthcare providers are not being trained on eating disorders in general, we can assume that they are not receiving specific training for BED. Given the findings of this review that document the nature, scope and

consequences of the public health problem of BED, the rationale for a proposed educational intervention is clear.

METHODS

Study Design

This study will provide an educational intervention to teach family medicine and internal medicine physicians, PAs, and NPs how to sensitively screen for and diagnose BED in their adult patient population. It will also teach providers how to refer patients to ED treatment professionals and how to support and monitor them during treatment. The study will include a statistical analysis comparing the proportion of patients screened for binge eating disorder pre- and post- education in order to gauge the effectiveness of the intervention.

Study Population and Sampling

Participants will consist of current primary care providers at Boston Medical Center. These providers will include physicians, nurse practitioners, and physician assistants. Eligible providers will be recruited from the family medicine and internal medicine departments. There are currently 135 primary care providers at BMC (87 internal medicine providers and 48 family medicine providers).

It is expected that the pre-intervention documented screening average (the P0) will be 2.5% based on one study in primary care providers who were involved in an eating disorder educational intervention.²³ It is also expected, based on that same study, that after an educational intervention, the documented screening rate (the P1) will increase to at least 5%. Half of the data for the study will be collected pre-intervention, and half of the data will be collected post-intervention for a q_1 and q_0 of 0.50. By using these parameters, an alpha of 0.05, beta of 0.2, we will need a sample size of at least

1,972 unique patients cared for by providers in our study across the six months in each group (intervention and control). In total, we will need at least 3944 total patients.

Recruitment

Initial contact will be made with the department chairs of family medicine and internal medicine at BMC. The importance of the study and the methodology will be explained in detail. After their approval, the department chairs will send out emails encouraging staff participation. For departments whose chairs do not respond, we will send emails directly to all their providers. The email will include an online survey through which the PCPs can express interest in participating. Respondents will provide answers to two questions -- whether or not they will be in clinic for 3 continuous months, and the number of adult patients they see monthly.

We will exclude any interested providers who will not be working in their clinic for 3 continuous months while conducting this educational intervention. We will also exclude any providers who see fewer than 50 adult patients monthly. From this pool of respondents, we will enroll 20 participants into our study. We will randomly assign participants into either the control or intervention group. The 10 participants in the control group will not receive an educational intervention and will not be given a screening tool. These providers will only be asked to complete our demographic survey. The other 10 providers will participate in the intervention. We will allow for an estimated 20% dropout rate during the study and still exceed the minimum sample size needed of 1,972 adult patients in total.

Availability to participate in the online educational intervention (one of several online Zoom lectures offered) will be mandatory to be part of the study. We will offer this lecture for the intervention group on three different days/times to maximize the number of providers who can participate. Additionally, CME credit will be offered for participation.

Educational Intervention

A one-hour lecture, delivered over Zoom in real time, will be developed and delivered by an eating disorder specialist to educate PCPs about binge eating disorder. Table 3 outlines the topics and learning objectives that will be covered during this lecture. The 20-minute topic on barriers to healthcare will include a 15-minute interview with a patient who was previously diagnosed with BED. This patient will discuss their lived experience with BED and PCP interactions that helped versus hindered their management of the disorder. There will also be 10 minutes at the end of the hour set aside as an opportunity for questions/answers.

The intervention will also include a brief introduction to the Binge Eating Disorder Screener-7 (BEDS-7) screening method, which is the screening tool providers will be taught and encouraged to use upon completion of this training experience. There is no agreed upon screening tool used in primary care, but this tool has an appropriate balance of sensitivity/specificity, while not being onerous for the clinicians to use. With a sensitivity of 100% and specificity of 39%, it performs its intended purpose -- to screen.¹⁰ The low specificity is due to the screening tool's tendency to pick up subclinical BED. A positive screen on the BEDS-7 is indicated by a "YES" to both question 1 and question 2.

An affirmative response to any of the remaining questions (3–7) requires follow-up conversations with the provider.

This tool is, at most, seven questions long depending on the answer to the first question. Some questionnaires like the Bulimic Investigatory Test-Edinburgh (BITE) or the Questionnaire of Eating and Weight Patterns (QEWP-R) are up to 33 questions in length, making them not feasible for a primary care setting.¹⁵ The BEDS-7 is also patient-reported, so providers do not have to spend their clinic time administering it. Instead, it can be printed out and given to patients while they are waiting for the PCP visit.

After screening, further discussion with another trained provider would be needed to make a diagnosis. However, with only an hour of time set aside for an educational intervention, training PCP practitioners to be competent in making a diagnosis is not a reasonable expectation. While the information provided during the lecture will be sufficient to empower providers to confidently and effectively engage their patients in a deeper conversation about their eating patterns, the measurable outcome our study will pursue is rate of screening.

Table 3: Outline of Binge Eating Disorder Lecture

Topic	Learning Objective	Duration
1. Epidemiology of binge eating disorder	The learner will understand that binge eating disorder is the most common eating disorder, affecting the most diverse set of	5 minutes

	patients in terms of age, race/ethnicity, gender, body size, and socioeconomic status.	
2. Psychopathology and pathophysiology of binge eating disorder	The learner will understand the underlying psychopathology and pathophysiology of binge eating disorder.	10 minutes
3. Barriers to healthcare faced by patients with binge eating disorder, including biases from healthcare providers, especially in regards to weight. A link to the Harvard implicit weight bias test will be given, and providers will be encouraged to take the test on their own time. ²⁷	The learner will understand the barriers to diagnosis of BED and accessing care.	20 minutes
4. Mental and physical comorbidities of binge eating disorders.	The learner will learn about the different health concerns that most commonly accompany binge eating disorder, and understand that they are common in primary care settings.	5 minutes

5. The screening method for binge eating disorder.	The learner will understand how to administer the BEDS-7 screening tool.	5 minutes
6. Referral network of dietitians, eating disorder therapists, and treatment programs in the Boston area.	The learner will understand the multidisciplinary treatment team required and where to refer patients to for treatment.	5 minutes.

Study Variables and Measures

The primary outcome assessed during this study is the proportion of adult patients that the PCPs screen for binge eating disorder. All providers would have been chosen from a list of available family medicine and internal medicine providers at Boston Medical Center. Each participating PCP will report their unique provider identification number. Data will be collected using the electronic medical records system. After the providers consent to participating in the study, they will provide the BED screening tool they have been using. This will be looked up in the EMR for all of their patients for 3 months prior to the intervention. After the educational intervention, the proportion of screens for each provider will be calculated by evaluating the percentage of patients age 18+ that have a BEDS-7 screen recorded in their electronic medical record (EMR). The data for the control group will be evaluated in the same way. By doing so, repeat patient visits will not be counted in the final percentage.

Data Collection

EMR data will be collected by three research assistants. For each clinician, information will be collected on all office visits for adult patients over the age of eighteen from three months prior to the educational intervention to three months after its completion. The information collected will only include whether or not a screening tool was inputted into their chart. Before the intervention, the clinicians will provide the screening tool they have been using (if any), and that tool will be looked up in the patient charts. For the purposes of this study, only documented screening methods will be counted. Post-intervention, the BEDS-7 screening tool will be the only tool used to account for BED screening activity in the intervention group. No other patient identifying information will be collected at any point during this study.

Data Analysis

The proportion of total patients screened for BED before and after the educational intervention will be computed across all the providers in the study. From here, differences in proportions pre- and post-intervention will be tested using a chi-squared test. The control group data will also be tested using a chi-squared test, and the mean change from baseline in screening will be compared to the intervention group. We expect to observe the following outcomes: (a) rates of screening at baseline will be similar in the intervention and control groups, (b) rates of screening in the post-evaluation period will be higher in the intervention group than in the control group, and (c) the mean change in

the proportion of patients screened from baseline to post-evaluation will be higher in the intervention group than in the control group.

Timeline and Resources

The entire study will last one year, beginning in the summer of 2021. Before the beginning of the study, IRB approval will be secured. The process will start with developing and finalizing the curriculum for the hour-long zoom lecture. During this process, we will also need to book a single BED patient to record his/her story.

In the Fall of 2021, recruitment will begin. Three research assistant will be hired to help facilitate communication between department heads and the research team. Contact will be made with the department chairs, and then the individual providers who will participate in the study. The research assistants will also be consenting participating clinicians in the study. The retrospective review of the 3 months of patient care and BED screening activity pre-intervention will take place during fall semester, once providers have enrolled in the study.

In Spring 2022, the zoom lecture will be offered a total of three times. Once providers have completed the intervention, their 3-month follow-up period will begin to accumulate post-intervention patient care and screening data. Data collection and analysis will be completed during the summer months.

In the Fall of 2022, the manuscript will be prepared and submitted for peer review.

Institutional Review Board

This study will be submitted to the Boston Medical Center Review Board for review under Expedited criteria. The EMR will need to be accessed using each patients' medical record number in order to record the number and proportion of BED screens performed in patient charts. Because the data can be de-identified, no patient contact is required for this study, and minimal protected health information will be abstracted from the medical record (presence of an ED screening tool in the EMR -- yes or no), this research constitutes minimal risk to patients of the enrolled healthcare providers.

CONCLUSION

Discussion

This study is aimed at increasing screening for binge eating disorder in primary care practice. In order to do this, we must educate providers both on the clinical diagnosis process and on social barriers that serve as obstacles to accessible healthcare. Because we are recruiting providers who are currently practicing, we can directly see the results of our educational intervention.

The strengths of our study include its randomized study design with a control group of providers drawn from the same base population as the intervention group. This design choice introduces scientific rigor and helps to minimize the influence of confounding factors on our observed outcomes. Our target population serves as another strength. The providers at BMC are representative of the PCPs who work in diverse metropolitan areas as they serve a diverse patient population in terms of race/ethnicity and socioeconomic status. This feature will increase the generalizability of our conclusions and the applicability of our findings.

There are some limitations of this study. First, participation is completely voluntary and the CME credit for participation may lead to a biased participation pool. Our sample may include more providers who are interested in binge eating disorder or who are already screening more often than their peers. We may recruit more providers who simply want CME credits, although the CME credits offered are commensurate with the participation time and are not substantial enough in quantity to likely introduce a

meaningful bias. This voluntary recruitment strategy may also lead to a nonresponse bias, excluding providers who are least interested in learning about eating disorders and thus least likely to screen for binge eating disorder.

Another limitation lies in the intervention itself. Since the online intervention is only an hour in duration, some important learning objectives will be brief. We will be tasked with the challenge to efficiently deliver the most relevant and practical information to our providers. The intervention will be designed to equip the providers with the rationale and the tool to routinely screen for BED in their patient population.

Finally, our data analysis plan is limited in scope by only measuring a single outcome of interest. Due to the lack of studies in adult primary care screening for BED, the baseline average proportion of adult patients screened is based on one study investigating a pediatric patient population. The expected increase in patients screened is based on this one study that evaluated screening for all eating disorders in pediatrics, not just BED. It is likely that the actual pre-intervention screening rate in our study will be lower than what was previously reported in the literature. In this regard, we consider our study a true pilot study of exploratory nature. Nonetheless, we set our sample size well above the minimum informed by prior research.

Clinical and/or Public Health Significance

It is the ultimate goal that the clinicians who participate in this study will modify their practice to screen more patients for binge eating disorder. BED is currently an underdiagnosed disorder given its relatively newer inception as a disorder in the DSM, combined with the biases against and negative perceptions of people who are overweight

or obese. Given its high prevalence in primary care clinics, providers should be proficient at recognizing and guiding a treatment plan for this disorder. Not only this, but providers are in need of training to develop competence and confidence in asking about BED symptoms and behaviors, and creating interactions where patients believe it is safe to share their personal experiences. This educational intervention and standardized screening tool could be adopted by medical institutions across the nation in order to increase provider competence and screening behavior so that this population of patients receives appropriate healthcare. By doing so, the long-term care and treatment outcomes of patients with BED can be improved.

APPENDIX

Binge Eating Disorder Screener-7 (BEDS-7)

1. During the last 3 months, did you have any episodes of excessive overeating (i.e., eating significantly more than what most people would eat in a similar period of time?)

Yes

No

NOTE: If you answered “NO” to question 1, you may stop. The remaining questions do not apply to you.

2. Do you feel distressed about your episodes of excessive overeating?

Yes

No

Within the past 3 months...

3. During your episodes of excessive overeating, how often did you feel like you had no control over your eating (e.g., not being able to stop eating, feel compelled to eat, or going back and forth for more food)?

Never or Rarely

Sometimes

Often

Always

4. During your episodes of excessive overeating, how often did you continue even though you were not hungry?

Never or Rarely

Sometimes

Often

Always

5. During your episodes of excessive overeating, how often were you embarrassed by how much you ate?

Never or Rarely

Sometimes

Often

Always

6. During your episodes of excessive overeating, how often did you feel disgusted with yourself or guilty afterward?

Never or Rarely

Sometimes

Often

Always

7. During the last 3 months, how often did you make yourself vomit as a means to control your weight or shape?

Never or Rarely

Sometimes

Often

Always

If a patient answers “no” to question 1, no further questions need to be completed. If a patient answers “yes” to question 1, they will complete the rest of the self-screener. A “yes” to question 2 indicates a positive screen. The answers to questions 3-7 indicates a need for follow-up discussion of the patient’s eating behaviors.

REFERENCES

1. Supina D, Herman BK, Frye CB, Shillington AC. Knowledge of binge eating disorder: a cross-sectional survey of physicians in the United States. *Postgraduate Medicine*. 2016;128(3):311-316. doi:[10.1080/00325481.2016.1157441](https://doi.org/10.1080/00325481.2016.1157441)
2. Maguen S, Hebenstreit C, Li Y, et al. Screen for Disordered Eating: Improving the accuracy of eating disorder screening in primary care. *General Hospital Psychiatry*. 2018;50:20-25. doi:[10.1016/j.genhosppsy.2017.09.004](https://doi.org/10.1016/j.genhosppsy.2017.09.004)
3. Sim LA, McAlpine DE, Grothe KB, Himes SM, Cockerill RG, Clark MM. Identification and Treatment of Eating Disorders in the Primary Care Setting. *Mayo Clinic Proceedings*. 2010;85(8):746-751. doi:[10.4065/mcp.2010.0070](https://doi.org/10.4065/mcp.2010.0070)
4. Grucza RA, Przybeck TR, Cloninger CR. Prevalence and correlates of binge eating disorder in a community sample. *Comprehensive Psychiatry*. 2007;48(2):124-131. doi:[10.1016/j.comppsy.2006.08.002](https://doi.org/10.1016/j.comppsy.2006.08.002)
5. Herman BK, Safikhani S, Hengerer D, et al. The Patient Experience with DSM-5-Defined Binge Eating Disorder: Characteristics, Barriers to Treatment, and Implications for Primary Care Physicians. *Postgraduate Medicine*. 2014;126(5):52-63. doi:[10.3810/pgm.2014.09.2800](https://doi.org/10.3810/pgm.2014.09.2800)
6. Baudet ML, Montastier E, Mesthe P, Oustric S, Lepage B, Ritz P. The SCOFF score: A screening tool for eating disorders in family practice. *e-SPEN Journal*. 2013;8(3):e86-e89. doi:[10.1016/j.clnme.2013.03.001](https://doi.org/10.1016/j.clnme.2013.03.001)
7. Saules KK, Carey J, Carr M, Sienko R. Binge-Eating Disorder: Prevalence, Predictors, and Management in the Primary Care Setting. *Journal of Clinical Outcomes Management*. 2015;22(11):512-528
8. Kornstein SG, Jr PEK, Herman BK, Puhl RM, Wilfley DE, DiMarco ID. Communication between physicians and patients with suspected or diagnosed binge eating disorder. *Postgraduate Medicine*. 2015;127(7):661-670. doi:[10.1080/00325481.2015.1084866](https://doi.org/10.1080/00325481.2015.1084866)
9. Table 1, DSM-IV and DSM-5 diagnostic criteria for binge-eating disorder - Management and Outcomes of Binge-Eating Disorder - NCBI Bookshelf. Accessed September 16, 2020. <https://www.ncbi.nlm.nih.gov/books/NBK338301/table/introduction.t1/>

10. Dorflinger LM, Ruser CB, Masheb RM. A brief screening measure for binge eating in primary care. *Eating Behaviors*. 2017;26:163-166. doi:[10.1016/j.eatbeh.2017.03.009](https://doi.org/10.1016/j.eatbeh.2017.03.009)
11. Mikhail ME, Klump KL. A virtual issue highlighting eating disorders in people of black/African and Indigenous heritage. *International Journal of Eating Disorders*. 2020;54(3):459-467. doi:10.1002/eat.23402
12. Guarda AS, Redgrave GW. Eating Disorders: Detection, Assessment, and Treatment in Primary Care. *Eating Disorders*. 2004;4(9):9.
13. Wever MCM, Dingemans AE, Geerets T, Danner UN. Screening for Binge Eating Disorder in people with obesity. *Obesity Research & Clinical Practice*. 2018;12(3):299-306. doi:[10.1016/j.orcp.2018.02.002](https://doi.org/10.1016/j.orcp.2018.02.002)
14. Ivezaj V, Kalebjian R, Grilo CM, Barnes RD. Comparing weight gain in the year prior to treatment for overweight and obese patients with and without binge eating disorder in primary care. *Journal of Psychosomatic Research*. 2014;77(2):151-154. doi:[10.1016/j.jpsychores.2014.05.006](https://doi.org/10.1016/j.jpsychores.2014.05.006)
15. Citrome L. Binge-Eating Disorder and Comorbid Conditions: Differential Diagnosis and Implications for Treatment. *Journal of Clinical Psychiatry*. 2017;78(suppl 1):0-0. doi:[10.4088/JCP.sh16003su1c.02](https://doi.org/10.4088/JCP.sh16003su1c.02)
16. Klatzkin RR, Gaffney S, Cyrus K, Bigus E, Brownley KA. Binge eating disorder and obesity: Preliminary evidence for distinct cardiovascular and psychological phenotypes. *Physiology & Behavior*. 2015;142:20-27. doi:[10.1016/j.physbeh.2015.01.018](https://doi.org/10.1016/j.physbeh.2015.01.018)
17. Dwyer JT, Melanson KJ, Sriprachy-anunt U, Cross P, Wilson M. Table 4, Classification of Weight Status by Body Mass Index (BMI). Published February 28, 2015. Accessed September 17, 2020. <https://www.ncbi.nlm.nih.gov/books/NBK278991/table/diet-treatment-obes.table4clas/>
18. Becker DF, Grilo CM. Comorbidity of mood and substance use disorders in patients with binge-eating disorder: Associations with personality disorder and eating disorder pathology. *Journal of Psychosomatic Research*. 2015;79(2):159-164. doi:[10.1016/j.jpsychores.2015.01.016](https://doi.org/10.1016/j.jpsychores.2015.01.016)

19. Rasmusson G, Lydecker JA, Coffino JA, White MA, Grilo CM. Household food insecurity is associated with binge-eating disorder and obesity. *International Journal of Eating Disorders*. 2019;52(1):28-35. doi:<https://doi.org/10.1002/eat.22990>
20. Harrington E, Crowther J, Henrickson H, Mickelson K. The relationships among trauma, stress, ethnicity, and binge eating. *Cultural diversity & ethnic minority psychology*. 2006;12:212-229. doi:[10.1037/1099-9809.12.2.212](https://doi.org/10.1037/1099-9809.12.2.212)
21. Brewerton TD, Rance SJ, Dansky BS, O'Neil PM, Kilpatrick DG. A comparison of women with child-adolescent versus adult onset binge eating: Results from the National Women's Study. *International Journal of Eating Disorders*. 2014;47(7):836-843. doi:[10.1002/eat.22309](https://doi.org/10.1002/eat.22309)
22. Crow SJ, Peterson CB, Levine AS, Thuras P, Mitchell JE. A survey of binge eating and obesity treatment practices among primary care providers. *International Journal of Eating Disorders*. 2004;35(3):348-353. doi:[10.1002/eat.10266](https://doi.org/10.1002/eat.10266)
23. Gooding HC, Cheever E, Forman SF, et al. Implementation and Evaluation of Two Educational Strategies to Improve Screening for Eating Disorders in Pediatric Primary Care. *Journal of Adolescent Health*. 2017;60(5):606-611. doi:[10.1016/j.jadohealth.2016.12.002](https://doi.org/10.1016/j.jadohealth.2016.12.002)
24. Palavras MA, Hay P, dos Santos Filho CA, Claudino A. The Efficacy of Psychological Therapies in Reducing Weight and Binge Eating in People with Bulimia Nervosa and Binge Eating Disorder Who Are Overweight or Obese—A Critical Synthesis and Meta-Analyses. *Nutrients*. 2017;9(3). doi:[10.3390/nu9030299](https://doi.org/10.3390/nu9030299)
25. Herman BK, Deal LS, Kando JC, et al. Use and Value of the 7-Item Binge Eating Disorder Screener in Clinical Practice. *The Primary Care Companion for CNS Disorders*. 2017;19(3). doi:[10.4088/PCC.16m02075](https://doi.org/10.4088/PCC.16m02075)
26. Mahr F, Farahmand P, Bixler EO, et al. A national survey of eating disorder training. *International Journal of Eating Disorders*. 2014;48(4):443-445. doi:10.1002/eat.22335
27. Project Implicit. Weight Implicit Association Test (Weight IAT). [online] Available at: <<https://implicit.harvard.edu/implicit/selectatest.html>> [Accessed 21 July 2021].

CURRICULUM VITAE

