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LOMA LINDA UNIVERSITY
School of Behavioral Health
in conjunction with the
Department of Psychology

Meal and Food Selection Patterns of Binge Episodes in Ethnically Diverse Adults

by

Abigail Grace Alido

A Project submitted in partial satisfaction of
the requirements for the degree
Doctor of Psychology

September 2020

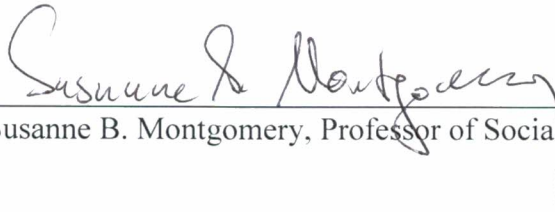
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Each person whose signature appears below certifies that this project in his/her opinion is adequate, in scope and quality, as a project for the degree Doctor of Psychology.



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ABBREVIATIONS

BED	Binge Eating Disorder
BN	Bulimia Nervosa
BMI	Body Mass Index
CBT	Cognitive Behavioral Therapy
IPT	Interpersonal Therapy
LLU	Loma Linda University
DSM-V	Diagnostic and Statistical Manual of Mental Disorders, 5 th edition
EDDI	Eating Disorder Diagnostic Interview
EDE	Eating Disorder Examination
OBE	Objective Binge Episodex

ABSTRACT OF THE DOCTORAL PROJECT

Meal and Food Selection Patterns of Binge Episodes in Ethnically Diverse Adults

by

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Doctor of Psychology, Graduate Program in Psychology
Loma Linda University, September 2020
Dr. Sylvia Herbozo, Chairperson

Food selection and associated patterns among ethnically diverse adults with binge eating deserves greater attention given binge eating prevalence among ethnic minorities. The aims of this study were to examine meal patterns, location, and food selection during binge episodes in an ethnically diverse sample of adults seeking binge eating treatment. Participants were 29 adults (86% female) with a mean age of 36.5 ($SD = 11.2$). Participants had an average body mass index of 32.4 ($SD = 8.74$). Approximately 41% of participants self-identified as Hispanic/Latino. The Eating Disorder Diagnostic Interview (EDDI) was administered to determine binge eating behavior and to obtain descriptions of binge episodes using a standardized assessment measure. Two independent coders conducted qualitative analyses of the binge episode data to identify the meal, location and food items as well as the food groups from which foods were consumed. Due to the high proportion of Latino participants, we also conducted exploratory comparative analysis between Latino and non-Latino binge eating patterns. We found that binge episodes most frequently occurred in the participants' homes and with dinner identified as the most common meal for Hispanic participants and lunch as the most common for non-Hispanic participants. We found that binge episodes typically contained starches and cheese followed by cookies, ice-cream, and chips. Mexican food, sweet snacks, and

starches were eaten in the largest quantity during binge episodes. Results indicated slight differences in food selection when comparing Latino and non-Latino participants. Future research should address these potential differences and explore the cultural context of food to inform adaptations and increase binge eating treatment efficacy.

CHAPTER ONE

INTRODUCTION

Overview

Eating disorder prevalence rates, specifically binge eating disorder (BED) and bulimia nervosa (BN), are increasing among ethnic and racial minority groups in North America, specifically among Latin American, African American, and European American groups (Pike, Hoek, & Dunne, 2014). Research indicates that binge eating is a significant problem for female minorities, specifically African Americans and Latin Americans, who tend to overeat in response to stressors including racism, sexism, classism, poverty, and sexual abuse (Crago & Shisslak, 2003). BED and BN are characterized by binge episodes (APA, 2013) which is described as eating a usually large amount of food within a two-hour period while experiencing a loss of control. Unlike BED, BN is also characterized by recurrent episodes of binge eating and compensatory behaviors to prevent weight gain. The compensatory behavior may include self-induced vomiting; misuse of laxatives, diuretics, or other medications; fasting, or excessive exercise. Binge eating is the most prevalent feature of disordered eating behavior compared to other disordered eating behaviors such as eating in secret and eating while upset (Mustelin, Bulk, Kaprio, & Keski-Rahkoken, 2017).

Binge eating has significant negative effects on physical and mental health. This form of disordered eating is associated with increased risk for obesity and diabetes and higher rates of depression and eating disorder psychopathology (Wu et al., 2013). Specifically, individuals with BED have a greater lifetime prevalence of type 2 diabetes

and higher rates of depressive disorders, anxiety disorders, substance use disorders, insomnia, and psychological distress (Reichborn-Kjennerud, Bulik, Sullivan, Tambs, & Harris, 2004). After controlling for age, sex, and race/ethnicity, individuals with BN have also been shown to meet criteria for at minimum one DSM-IV disorder, with the anxiety, mood, or impulse disorder as the most common disorders (Hudson et al., 2007).

Additionally, individuals with BED, BN, subthreshold BED, or any binge eating reported significant role impairment in at least one domain of their life (Hudson et al., 2007).

Overall, binge eating is associated with poor physical and mental health.

Despite the prevalence of binge eating across racial/ethnic groups, few studies have focused on specific aspects of binge episodes, such as meal and food selection patterns, among racially/ethnically diverse populations. We aim to examine types of food consumed during binge episodes, typical meals in which binges tend to occur, and location of binge episodes in a sample of racially/ethnically diverse adults. This study is expected to help inform binge eating treatment for racially/ethnically diverse populations.

Binge Eating, Race/Ethnicity, and Acculturation

Studies examining the influence of race/ethnicity on binge eating behavior have shown differences in prevalence and presentation of binge eating symptoms. In a nationally representative sample of the U.S. population, Marques et al. (2011) reported that binge eating was more prevalent in ethnic minorities compared to Whites and BN was more prevalent in Blacks and Latinos compared to Whites. With regards to binge eating symptoms, minority women are less likely to report loss of control during binge eating compared to White women (Sánchez-Johnsen et al., 2003). In addition, ethnic

minorities seeking eating disorder treatment report substantial distress and suffering associated with eating disorders and obesity, with higher levels of severity on body shape and eating concern compared to Whites (Franko et al., 2012).

Black individuals have been found to have high rates of BED and greater frequency of binge episodes when compared to European American women (Taylor, Caldwell, Baser, Matusko, Faison, & Jackson, 2013; Bulik, Sullivan, & Kendler, 2002; Lydecker & Grilo, 2016). Black women had higher rates of obesity and lower rates of under-eating and compensatory behaviors compared to White women (Taylor, Caldwell, Baser, Matusko, Faison, & Jackson, 2013). Additionally, Black women with BED and obesity had higher BMI, and greater fear of weight gain than other minority groups (Fernandes, Crow, Thuras, & Peterson, 2010).

BED is the most common eating disorder among Latinos (Perez et al., 2016). Latinos are more likely to report a fear of losing control during a binge episode compared to White or Black women (Bennet & Dodge, 2007). In a study of women with disordered eating, Cachelin, Veisel, Barzegarnazari, & Steiger-Moore (2000) found that Latino women were the most likely to use diuretics as compensatory behavior compared to Asian American, Black, and White women. Study findings also showed that Black women were most likely and White women were least likely to use laxatives.

Research is mixed with regards to whether BED prevalence does differ between Asian Americans and White individuals. Compared to White individuals, Asian Americans are more likely to report binge eating and are less likely to report distress or loss of control and receive treatment (Lee-Winn, Mendelson, & Mojtabai, 2014). Lee-Winn et al. (2014) found that Asian Americans were also less likely to report fear of

gaining weight, upset feelings during and after binge eating, and eating when not hungry. Other research found that Asian American women were more likely than White women to report embarrassment after eating a large amount of food (Bennet & Dodge, 2007). There is limited mixed research regarding binge eating pathology among Asian Americans.

Research suggests that the impact of Westernization, cultural assimilation, and acculturation, particularly in Asian Americans, may account for the similarity of eating pathology among Asian Americans and Whites. This elicits questions about the influence of Western culture on eating pathology and disordered eating in culturally diverse populations (Quick & Byrd-Bredbenner, 2014; Baillie & Copeland, 2013). As globalization is increasing, cultural influences are fusing together creating a complex societal transformation, which when combined with the processes of global body ideals of thinness, along with fast food culture and dieting, influence the onset and prevalence of eating disorders in various cultural contexts (Pike et al., 2014). Research has shown that acculturation is linked to disordered eating. In a study by Cachelin and colleagues (2014), Latino, Asian American and White women with eating disorders were less likely to be bilingual, and tended to speak only English, and were more likely to have US-born mothers and fathers compared to healthy controls. Cachelin et al. (2000) also found that individuals with parents who were not US-born were less likely to have received eating disorder treatment. Further, Shuttleworth and Zotter (2011) found that Black individuals with a strong ethnic identity tend to be less likely to endorse BED and BN pathology, and Blacks with low ethnic identity are at greater risk for developing eating disorder pathology.

Binge episodes

There is a strong need to examine eating patterns and food selection patterns during binge episodes in adults with binge eating. Recent research indicates that BED and BN are the most common eating disorders across racial/ethnic groups and binge eating behavior is more prevalent for Latino, Black, and Asian compared to White individuals (Marques et al., 2011). It is important to understand the composition of a binge episode as the food items frequently consumed may suggest additional considerations for interventions, identify areas to target in binge eating treatments, and improve effectiveness and response to treatment.

Meal Patterns

Research has examined the patterns of meals and binge episodes of individuals with binge eating. In a sample of predominately White women, Masheb et al. (2011) found that women with BED ate more frequent meals and had fewer binge eating episodes. Johnson et al. (1995) found that individuals with binge eating behavior tended to engage in binge episodes more frequently at dinner compared to lunch and breakfast. In contrast to research identifying binges primarily occurring during meal times, Johnson et al. (1995) also reported that individuals with BED associated binge eating with late snacking after midnight. Consistent with research for individuals with BED, individuals seeking treatment for BN have reported that binge episodes occur most frequently in the afternoon or evening (Wallin et al., 1994). Additionally, women with BN were found to typically consume large meals in the afternoons and evenings (Weltzin, Hsu, Pollice, & Kaye, 1991). In a study of predominantly White women, women with BN ate fewer

meals than women with BED and women without binge eating in the previous month (Masheb, Grilo, & White, 2011). Meal patterns appear to be consistent between individuals with BED and BN based on research conducted with samples consisting of primarily White women.

Studies have also found tendencies for meals in which binges most frequently occurred. In a study examining meal patterns among primarily White women with a minimum diagnosis of recurrent binge eating, breakfast was the least frequently consumed meal while dinner was the most frequently consumed meal (Harvey et al., 2011). Similarly, Cachelin et al. (2016) found that breakfast was the least consumed meal while dinner was the most frequently consumed meal among White and Latino women consistent with research in samples with predominantly white women. Additional research supports meal times to be primarily associated with binges. In a study examining binge episodes among a female sample, they found that binges more frequently occurred during meal times rather than during snacks (Allison & Timmerman, 2007). Interestingly, Latino women that ate more regular meals also reported more frequent binge episodes which is inconsistent with research on White females (Cachelin et al, 2016). This may be due to social and familial context, in which Latino women may tend to have binge episodes as part of regularly occurring meals due to a social pressure to eat (Cachelin et al, 2016).

Research is mixed with regards to the relationship between meal patterns and eating disorder pathology. Harvey et al. (2011) found no significant associations between meal (breakfast, lunch, or dinner, and total) frequency and eating disorder pathology or depression in a sample of predominantly European American women. However, research

examining differences in meal patterns among minorities has found associations between meal patterns and different aspects of eating disorder pathology. Cachelin et al. (2016) found that associations between distress, weight and shape concern, BMI, and meal patterns differ by diagnosis between BED and BN in Latino women. For Latino women with BED, the frequency of lunch was associated with higher BMI, while evening snacking was associated with lower BMI and reduced weight importance. Greater distress for binge eating was associated with greater frequency of breakfast, mid-morning snack, and total meals (Cachelin et al., 2016). For Latino women with BN, the frequency of evening snack was associated with less dietary restriction and greater weight and shape concern, total snack frequency was associated with increased weight concern (Cachelin et al., 2016). Grilo and colleagues (2012) found patients with night eating report more binge episodes and greater eating disorder pathology and depression compared to patients without night eating. Meal patterns may be an important area to consider addressing in binge eating treatments for racially/ethnically diverse populations, given associations between meal patterns and eating pathology.

Location of Binge Episodes

There is limited research on the location of binge episodes for individuals with BED and BN. In a study of women with non-purge binge eating, binge episodes occurred equally at home and at restaurants (Allison et al., 2007). Other research found that individuals with BED were more likely to eat at home, while those without BED were more likely to eat at work and in a restaurant (Johnson et al., 1995). In a sample of primarily women with binge eating, binge episodes occur in the evenings at dinner at

restaurants (Johnson et al., 1995). Individuals with BED were more likely to eat alone, and less likely to eat with friends or family when compared to individuals with non-clinical levels of binge eating and individuals without binge eating in a sample of predominantly European American women (Johnson et al., 1995). As limited research exists on the location of binge episodes, additional information regarding the location of binge episodes may inform binge eating tendencies and influence interventions for binge eating.

Food Selection

Studies have examined food items consumed during binge episodes via self-report and laboratory studies. In a study investigating self-reported binge episodes of predominately White women with non-purge binge eating, most binge episodes consisted of multiple food items that were typically high in calories and low in nutrients. Most binge episodes contained fats, sweets, and alcohol, breads and pastas. Foods in binge episodes consumed in the greatest amount relative to the amount of other items consumed in the binge episode were high-fat meat, sweet snacks, and salty snacks (Allison & Timmerman, 2007). Raymond et al., (2003) found that compared to women with obesity, those with BED consumed more fat, carbohydrates, and protein (Raymond et al., 2003) in self-reported binge episodes.

Laboratory studies have examined binge eating in individuals with BED after they are instructed to eat. Yanovski et al. (1992) found that women with BED consumed a greater percentage of fat and lower percentage of protein in a laboratory setting. Specifically, participants primarily selected highly palatable food items that are high in

fat and carbohydrates when instructed to eat a normal meal and when told to let themselves eat as much as they could. During normal and binge meals, women with BED and obesity ate more dessert and snack food items (cake, ice cream, potato chips, rice, and butter) compared to women with obesity only (Yanovski et al., 1992). In contrast, in a study by Raymond et al. (2007), women with BED and obesity consumed significantly more dairy items when instructed eat compared to women with obesity only (Raymond et al., 2007). Women with BED and obesity also tended to consume more bread, pasta, and cereal items compared to women with obesity only (Raymond et a., 2007).

Food selection for individuals with BN tends to be similar to those of for individuals with BED. A study examining food selection in women with BN found that binges typically included bread and sandwiches, cakes and buns, pasta, chocolate, pizzas, and sweets (van der Ster Wallin, Norring, & Holmgren, 1994). Dairy was found to be the most frequent source of protein and bread, cheese and ice cream were the most common sources of fat (van der Ster Wallin, Norring, & Holmgren, 1994). Additional studies are warranted in order to further understand food selection during binges among individuals with BN.

Current Treatment

Research has identified several effective psychological treatments for BED, including cognitive behavioral therapy (CBT), interpersonal psychotherapy (IPT), and behavior therapy. CBT has been studied most extensively and has strong research supporting its efficacy. CBT has been shown to improve binge eating, eating pathology, and psychological functioning (Grilo et al., 2014; Wilson, 2011). Approximately 50% of

patients with BED achieve complete remission from binge eating and eating pathology following CBT for BED (Wilson, 2011). Compared to IPT, CBT has been found to generate higher abstinence rates from binge eating and purging among European American, Hispanic, Black, and Asian women (Chui et al., 2007). Recent studies have also shown support for self-help CBT and guided CBT (Grilo, White, Masheb, & Gueorguieva, 2015), allowing for treatment specificity, as individuals are in control of their rate of behavior change and choose to modify the self-help treatment to impact personal factors (Grilo et al., 2014).

Research has also examined psychological treatments for BED and BN with Latina American women. In a sample of predominantly European American women with a limited number of Latina America and African women, Chui et al., (2007) found that CBT is effective for minority women with BN. More recently, Perez, Ohrt, and Hoek (2016) assert that a lack of systemic guidelines for mental health providers on adapting BED and BN treatments for Latino/a individuals may reinforce barriers to seek treatment. Perez et al. (2016) suggest adaptations to treatment may be beneficial to treatment retention and outcome for Latino/a individuals, such as including psychoeducation, family components, and addressing acculturation related issues. For instance, rather than emphasizing regular pattern of meals, a focus on portion size and food and nutritional content may improve treatment response in Latinas with binge eating (Cachelin et al., 2016).

As studies suggest differences in presentation of binge eating among minorities, there is also research indicating racial/ethnic differences in treatment response. African Americans were more than twice as likely to drop out of treatment than European

Americans; however, they showed greater reductions in eating disorder psychopathology (Thompson-Brenner et al., 2013). This could be due to early response to treatment leading to dropout or those not experiencing reduction in symptoms dropped out of treatment (Thompson-Brenner et al., 2013), suggesting that different factors in binge eating treatments for individuals from certain racial/ethnic groups may influence treatment effectiveness. However, current treatment does not address these potential variations and research has yet to thoroughly understand the differences and driving mechanisms behind treatment completion and prevention of remission.

Limitations of the Current Research

Research on binge eating behavior, specifically meal and food selection patterns among racial/ethnic minorities, is limited. The few studies to date also lack racially/ethnically diverse individuals within samples. While there exists literature that examines eating behavior across and between ethnicities, the majority of studies consist of predominantly European Americans with rather small proportions of other racial/ethnic groups and other studies did not report ethnicity. A majority of the research was also primarily conducted with women. Additionally, several studies on binge eating were conducted prior to an established operationalized definition of a binge episode.

Purpose of Study

There is a lack of research on food selection and associated patterns among racially/ethnically diverse adults who binge eat. This is an area requiring greater attention given the prevalence of binge eating and BED among racial/ethnic minorities. As

discussed, there are differences in binge eating behavior among racial/ethnic minorities; therefore, it is important to build upon this research by examining food selection and associated patterns in a racially/ethnically diverse sample. Such research could inform treatment that targets food selection and triggers, along with environmental cues, to be culturally relevant to diverse populations. Targeting food selection patterns in treatment may help address the challenges to losing weight and reducing the frequency of binges, specifically by increasing sensitivity to the variety of food intake among racially/ethnically diverse populations. The current study will examine the food selection, location, and meal patterns of binge episodes in a racially/ethnically diverse sample of adults seeking binge eating treatment. Based on the limited research in this area, we hypothesize that binge episodes will occur at dinner and in restaurants, binge foods will include sweets, fats, breads/pasta, and salty snacks. We also expect that binge episodes will include culturally relevant foods, such as Mexican food based on prior research on prevalence of binge eating in ethnic minorities and influence of culture on eating pathology . Additionally, we will compare food selection and meal patterns between Latino and non-Latino participants. We hypothesize that food selection during binge episodes will differ for Latino and non-Latino participants given prior research on ethnic differences in food preferences.

CHAPTER TWO

METHODS

Participants

Twenty-nine participants were recruited via flyers seeking adults who are interested in treatment for binge eating. This was treatment part of a randomized controlled trial examining food response training for binge eating in adults. Inclusion criteria was adults (18 – 55 years old) who experienced one or more binge episodes per week for at least three months prior to enrollment in the study. Individuals with active substance abuse were not eligible for the study. Flyers were posted at Loma Linda University (LLU) affiliated medical clinics and centers (e.g., Gastroenterology clinic, Diabetes Treatment Center, Center for Health Promotion), LLU wellness center, postings on Craigslist, and local coffee shops. Inclusion criteria was adults ages 18 - 65 years old and full or sub-threshold binge eating disorder or bulimia nervosa according to the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5). Exclusion criteria are current excessive alcohol or illicit drug use.

Participants were 29 adults (86% female) with ages ranging from 19 to 57 years old ($M = 36.5$, $SD = 11.2$). Participants had an average body mass index of 32.4 ($SD = 8.74$) 24.1% ($n = 7$) were of normal weight, 24.1% ($n = 7$) overweight, and 51.7% ($n = 15$) obese. Approximately 41% of participants self-identified as Hispanic/Latino, 24.1% White, 17.2% Asian, 10.1% biracial, 3.4% Black, and 3.4% Native Hawaiian/Pacific Islander. A majority of the participants were born in the U.S. (82.8%, $n = 25$) with other countries of origin including Brazil, Colombia, Portugal, Vietnam, and South Korea.

Eighty-two percent of participants ($n = 25$) reported English as the primary language spoken at home. Due to the high proportion of Latino participants and limited Black, Asian, Native Hawaiian/Alaskan, and Other participants, we re-categorized participants as Latino and non-Latino for exploratory comparative analyses.

Measures

Demographics

Participants were asked to provide information regarding their ethnicity, primary language, years in the US, country of birth for self and parents, annual income and educational level.

Eating Disorder Diagnostic Interview

The Eating Disorder Diagnostic Interview (EDDI), an adapted version of the Eating Disorder Examination (EDE), is an investigator-based interview that assesses disordered eating behaviors, such as objective binge episodes and compensatory behaviors, and cognitions and attitudes associated with eating disorders. The EDDI has shown acceptable internal consistency with Cronbach's alpha ranged from .76 to .90 and discriminant validity between individuals with eating disorders and controls (Rizvi, Peterson, Crow, & Agras, 2000). This interview has also demonstrated strong psychometric properties across ethnicities (Williamson, Anderson, Jackman, & Jack-son, 1995).

For the current study, we will examine the descriptions of objective binge

episodes (i.e., content), and the location and meal time of the reported objective binge episodes. We will specifically examine items used to assess a binge episode (“Different people mean different things by “overeating” so I would like to explain the term "binge episode" for you. This means eating an amount of food that most people would consider very large, and secondly feeling like you cannot control your eating. Have you ever had a binge episode like that? Can you give me an example of what you have eaten at these times?”) and assesses the frequency of binge episodes over the past twelve months (“For the past 4 weeks, how many days did you have binge episodes? How many episodes did you have on each of those days? Then for the 2 months before that, how many days did you have a binge episode and how many total episodes were there? For the 9 months before that, how many days and episodes were there?”).

Procedure

Participants completed the EDDI and a demographics questionnaire, which was administered during their first assessment as part of the randomized control trial. Before beginning the assessment, participants were presented with an informed consent form. Contact information of the primary investigator was also be provided to allow participants to contact the principal investigator with concerns or questions about the study. Upon giving consent and agreeing to participate in the study, participants were asked to complete the assessment which included a diagnostic interview and questionnaires. Assessments were conducted by doctoral-level clinicians who were trained to administer the measures of the study. The Eating Disorder Diagnostic Interview (EDDI; Stice & Shaw, 2003) was used to determine the eating disorder

diagnosis and examine the food content of objective binge episodes. Participants completed the EDDI and self-report questionnaires and had their height and weight measured using a medical beam scale. Written informed consent was obtained from all participants. Participants were paid \$20 for completing the assessment.

Analysis

Two doctoral level research assistants will review the manually and audio recorded EDDI's conducted by other doctoral level research assistants who administered the EDDI's to participants. As reported by each participant, the type and amount of each food item consumed during two OBEs in the past month will be documented. The location and meal-time of the binge, and presence of fast food in the binge episode will be documented. To establish reliability, the two research assistants will code every OBE. Thus, each OBE will be coded twice. Discrepancies will be discussed to reach 100% reliability.

To identify the most common binge foods and most common predominant food groups consumed, we will conduct qualitative analysis with the binge items, specifically coding the food items and food groups, calculating frequencies, and then examining the frequencies to identify patterns. Codes will be created based on the food items and food groups studied in prior research. Using an open coding process, we will identify other food items and food groups frequently consumed and add them to our initial list of codes.

Each OBE will be coded by food items and food groups. Contents of the OBE will be coded into corresponding food items (e.g. steak, chocolate) and food groups (e.g. high fat meat, sweet snacks). Next, a predominant food group for each OBE will be

identified. This is defined as the food group from which foods were consumed in the largest quantity (e.g., cups, ounces) during OBEs.

After coding is completed, the frequencies for food items and food groups will be examined for frequency patterns. Specifically, the most prevalent food items (i.e., most frequently consumed during OBEs, regardless of amount) and most predominant food groups (i.e., consumed in the largest amount during OBEs) will be identified.

To identify most common location of binge episodes, we will calculate frequencies of the locations of the binge episodes (e.g. home, office, restaurant). Frequency patterns will be examined to identify the most common locations.

To identify the most common meal that a binge episode occurred, we will calculate the frequencies of meals reported (i.e. breakfast, lunch, dinner, and snack). Frequency patterns of meals will be examined and most common meal will be identified.

To examine possible ethnic differences in binge eating patterns, we will compare meal-times, location for binge episodes and foods consumed between Latino and non-Latino participants given the ethnic breakdown of the sample and the large proportion of Latino participants in this study.

CHAPTER THREE

RESULTS

Eating Disorder Diagnoses and Objective Binge Episode Frequency

Approximately 41% of participants were diagnosed with BED, 6.9% sub-threshold BED, 34.5% BN, and 17.2% sub-threshold BN based on DSM-5 criteria and the EDDI. Participants reported an average of 5.0 ($SD = 4.0$) objective binge episodes (OBEs) per week for the past three months.

Among the Latino participants, 41.7% were diagnosed with BED, 8.3% sub-threshold BED, 41.7% BN, and 8.3% sub-threshold BN. Approximately 41.2% of non-Latino participants were diagnosed with BED, 5.9% sub-threshold BED, 29.4% BN, and 23.5% sub-threshold BN.

Objective Binge Episodes during Meals and Snacks

Brunch was the eating period in which OBEs occurred least for participants (6.3%) whereas dinner was when OBEs occurred the most frequently (43.8%). For Latino participants, dinner (55.6%) was the eating period in which OBEs occurred most frequently. Among non-Latino participants, lunch (42.9%) was the eating period in which OBEs occurred most frequently. Table 1 shows the frequencies for the meals and snacks in which OBEs occurred.

Table 1. Type of Meal or Snack During Binge Episodes (n = 16)

	non-Latino (n = 7)		Latino (n = 9)		Total	
	n	%	n	%	n	%
Breakfast			2	22.2	2	12.5
Brunch	1	14.3			1	6.3
Lunch	3	42.9	1	11.1	4	25.0
Dinner	2	28.6	5	55.6	7	43.8
Snack	1	14.3	1	11.1	2	12.5

Location of Objective Binge Episodes

Overall, OBEs occurred most frequently at the participants' home (61.1%). The frequency of OBEs in cars (5.6%) or at a social event (5.6%) were less frequent. For Latino (66.7%) and non-Latino participants (58.3%), OBEs occurred most frequently at their homes. Table 2 shows the frequencies for the locations in which the OBEs occurred.

Table 2. Location of Binge Episodes (n = 18)

Location	non-Latino (n = 12)		Latino (n = 6)		Total	
	n	%	n	%	n	%
Home	7	58.3	4	66.7	11	61.1
Restaurant	1	8.3	2	33.3	3	16.7
Work	1	8.3			2	11.1
Car	2	16.7			1	5.6
Social event	1	8.3			1	5.6

Food Selection

Table 3 shows the frequencies for the food items, food groups, and predominant food groups across both ethnic groups. The most common food items consumed in OBEs

were breads/grains/noodles (58.6%) and cheese (37.9%). The majority of the OBEs contained foods from the starches (69.0%), sweet snack (69.0%), beverage (59.6%) and high-fat meat groups (55.2%). The most common predominant food groups consumed during OBEs were Mexican food (80%), sweet snacks (40%) and starches (30%). We also examined the presence of fast food in the OBE. Fast food was present in 21.1% of OBEs.

Table 4 shows the frequencies for food items, food groups, and predominant food groups for Hispanic and non-Hispanic participants. The most common food items consumed in OBEs by Hispanic participants were breads/grains/noodles (75%), beverages (83.3%) and cheese (66.7%). In contrast, the most common food items consumed in OBEs by non-Latino participants were breads/grains/noodles (47.1%) and chips (29.4%). Among Latino participants, food groups most frequently consumed during OBEs included starches (83.3%) and high-fat meat (75%) followed by sweet snacks, (66.7%) salty snacks (66.7%), and vegetables (66.7%). For non-Latino participants, food groups most frequently consumed were starches (58.9%), sweet snacks (70.6%), and high-fat meat (41.2%). The most predominant food for Latino participants were Mexican food (75%), pizza (50%), and sweet snacks (25%). For non-Latino participants the most predominant foods were also Mexican food (100%), pizza (66.7%) and sweet snacks (50%).

Table 3. Food groups and items by frequency of consumption during binge episodes (n = 29)

Food Groups and Items	Total in Binge		Predominant in Binge	
	n	%	n	%
Starches	20	69.0	6	30.0
Bread/Grains/noodles	17	58.6		
Rice	4	13.8		
Potatoes	2	6.9		
Beans	5	17.2		
Cereal/granola	2	6.9		
High fat meat	16	55.2	3	18.8
Steak	2	6.9		
Fried chicken	3	10.3		
Bacon	3	10.3		
Hamburgers	4	13.8		
Other beef	7	24.1		
Other pork	2	6.9		
Sausage/salami	4	13.8		
Hot dogs	2	6.9		
Ham	1	3.4		
Mexican Food	5	17.2	4	80.0
Tacos	3	10.3		
Burritos	1	3.4		
Quesadillas	2	6.9		
Tamales	1	3.4		
Enchiladas	1	3.4		
Taquitos	1	3.4		
Non-high fat protein	10	34.5	0	0
Eggs	3	10.3		
Vegetarian “meat”	2	6.9		
Poultry	2	6.9		
Tofu	2	6.9		
Seafood	1	3.4		
Other fried food	1	3.4	0	0
Pizza	5	17.2	0	0

Table 3. (continued)

Dairy	14	48.3	0	0
Cheese	11	37.9		
Milk	4	13.8		
Yogurt	2	6.9		
Sweet snacks	20	69.0	8	40.0
Cake/pie	3	10.3		
Ice cream	8	27.6		
Cookies	7	24.1		
Chocolate	1	3.4		
Other sweet snacks	8	27.6		
Salty snacks	13	44.8	3	23.1
Chips	8	27.6		
French fries	5	17.2		
Crackers	1	3.4		
Other salty snacks	1	3.4		
Vegetables/salad	13	44.8	2	15.4
Fruit	6	20.7	0	0
Beverages	17	59.6	0	0
Soft drinks	5	17.2		
Juices	4	13.8		
Alcoholic beverages	1	3.4		
Tea	3	10.3		
Coffee	2	6.9		
Water	7	24.1		
Pasta sauce	4	13.8	0	0
Soup	3	10.3	0	0
Condiments (if any)	15	51.7	0	0
Ranch	1	3.4		
Salsa	5	17.2		
Butter	3	10.3		
Peanut Butter	1	3.4		
Cream cheese	1	3.4		
Sour cream	1	3.4		
Dressing	3	10.3		
Mustard	2	6.9		
Mayo	1	3.4		
Ketchup	1	3.4		
Other	6	20.7		

Table 4. Food groups and items by frequency of consumption during binge episodes in Hispanic and Non-Hispanic groups

Food Groups and Items	non-Latino (<i>n</i> = 17)				Latino (<i>n</i> = 12)			
	Total		Predominant		Total		Predominant	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Starches	10	58.8	4	40	10	83.3	2	20
Bread/grains/noodles	8	47.1			9	75.0		
Pasta	3	17.6			2	16.7		
Rice	2	11.8						
Tortilla	1	5.9			3	25.0		
Rice	3	17.6			1	8.3		
Potatoes	2	11.8						
Beans	2	11.8			3	25.0		
Cereal/granola	1	5.9			1	8.3		
High-fat meat	7	41.2	1	14.2	9	75.0	2	22.2
Steak					2	16.7		
Fried chicken	2	11.8			1	8.3		
Bacon	1	5.9			2	16.7		
Hamburgers	1	5.9			3	25.0		
Other beef	3	17.6			4	33.3		
Other pork	1	5.9			1	8.3		
Sausage/salami	3	17.6			1	8.3		
Hot dogs					2	16.7		
Ham					1	8.3		
Mexican Food	1	5.9	1	100	4	33.3	3	75
Burritos					1	8.3		
Tamales	1	5.9						
Quesadillas					2	16.7		
Enchiladas	1	5.9						
Taquitos					1	8.3		
Tacos					3	25.0		
Non-high fat protein	4	23.5			4	33.3		
Vegetarian meat	2	11.8						
Poultry	1	5.9			1	8.3		
Tofu	1	5.9			1	8.3		
Seafood	1	5.9						
Eggs	1	5.9			2	16.7		
Other fried food	1	5.9						
Pizza	3	17.6	2	66.7	2	16.7	1	50

Table 4. (continued)

Dairy	4	23.5			8	66.7		
Cheese	3	17.6			8	66.7		
Milk	1	5.9			3	25.0		
Yogurt	1	5.9			1	8.3		
Sweet snacks	12	70.6	6	50	8	66.7	2	25
Cake/pie	3	17.6						
Ice cream	4	23.5			4	33.3		
Cookies	4	23.5			2	16.7		
Chocolate	1	5.9						
Other sweet snacks	4	23.5			4	33.3		
Salty snacks	5	29.4	2	40	8	66.7	1	12.5
Chips	5	29.4			3	25.0		
French fries					5	41.7		
Crackers	1	5.9						
Other salty snacks					1	8.3		
Vegetables/salad	5	29.4	1	20	8	66.7	1	12.5
Fruit	3	17.6			3	25.0		
Beverages	7	41.2			10	83.3		
Soft drinks	2	11.8			3	25.0		
Juices	3	17.6			1	8.3		
Alcoholic beverages					1	8.3		
Tea	2	11.8			1	8.3		
Coffee					2	16.7		
Pasta sauce	3	17.6			1	8.3		
Soup	2	11.8			1	8.3		
Condiments	7	41.2			8	66.7		
Ranch					1	8.3		
Salsa	3	17.6			2	16.7		
Butter	1	5.9			2	16.7		
Peanut Butter					1	8.3		
Cream cheese					1	8.3		
Sour cream	1	5.9						
Dressing	1	5.9			2	16.7		
Mustard					2	16.7		
Mayo					1	8.3		
Ketchup					1	8.3		
Other	3	17.6			3	25.0		

CHAPTER FOUR

DISCUSSION

The current study examined food selection and meal patterns during binge episodes in a racially and ethnically diverse sample of adults seeking binge eating treatment. A majority of the sample were Latino, U.S. born, and English speaking. Most of the participants met criteria for BED or BN. We found that dinner was the meal in which participants had binge episodes and most binge episodes occurred at their homes. Food items most commonly consumed were starches and cheese. Beverages were also commonly consumed in binge episodes for Latino participants, while cheese was commonly consumed for non-Latino participants. Both Latino and non-Latino participants consumed larger amounts of Mexican food, pizza, and sweet snacks when these foods were present in a binge episode.

In line with our hypothesis, dinner was identified as the most common eating period in which they experienced binge episodes. This aligns with previous research in that binge episodes primarily occurred in the evening at dinner and after midnight snacks (Johnson et al., 1995). Similar eating patterns have been reported for a sample of women with BED and obesity in which women with BED ate more during the evening compared to earlier in the day (Raymond et al., 2003). Prior research has also found that patients with greater disordered eating pathology tend to eat more at night (Grilo et al., 2012). The overall finding that binge episodes occurred most often during dinner may be partly attributed to our treatment-seeking sample which met criteria for binge eating disorder or bulimia nervosa.

With regard to ethnic differences, Latino participants reported engaging in binge

episodes during dinner and later in the day, consistent with our hypothesis; however, Non-Latino participants reported engaging in binges across meals, with a greater percentage of binges occurring during lunch. These findings build upon previous research examining most frequently consumed meals in Latino women with BED and women with BED (Cachelin et al., 2016; Raymond et al., 2003). Cachelin et al. (2016) found that dinner was the most frequently consumed meal in which binge episodes occurred among a sample of Latino women with BED. Consistent with past research examining meal patterns among individuals with BED (Cachelin et al., 2016), we found that dinner was the most frequent eating period in which binge episodes occurred for Latino participants. In contrast, binge episodes tended to occur earlier in the day for non-Latino participants in our study. These differences highlight differences in meal patterns of White and Latino individuals with binge eating and suggest that binge eating habits may differ between ethnicities.

In the study, home was the most common location of binge episodes which is inconsistent with our hypothesis and previous research in this area. Johnson et al. (1995) found that binge episodes tended to occur at restaurants among a sample of predominantly White women seeking binge eating treatment. Allison and Timmerman (2007) reported that half of the binge episodes occurred in restaurants among a sample of predominantly White women who binge eat. They proposed that eating in social settings such as restaurants may be due to peer pressure to eat more and exposure to larger quantities of food as well as socioeconomic status which allowed for more frequent meals outside of the home. The contrasting findings on location of the binge episodes may be due to the representation of ethnic minorities in our sample. The finding that

binge episodes occurred more frequently in the home for this sample with predominantly Latino participants likely related to the familial pressure to eat regular meals and to eat what is offered as food is seen as sacred and communicates love and respect (Cachelin et al., 2016; Shea et al., 2012). These cultural differences in the location of binge episodes highlight the importance to further explore and better understand binge eating in ethnic minorities.

Our findings of most common food items were somewhat consistent with our hypothesis. During binge episodes, the most common food items consumed were breads/grains/noodles and cheese, followed by cookies, ice-cream, and chips. Among Latino and non-Latino participants, breads/grains/noodles were most frequently consumed. Latino participants also frequently consumed beverages and cheese while non-Latino participants frequently consumed chips. Compared to non-Latino participants, Latino participants had a wider array of food groups commonly consumed during binge episodes. Most common food groups among Latino participants were starches and high-fat meat, followed by dairy, sweet snacks, salty snacks, and vegetables. In contrast, among non-Latino participants starches, sweet snacks and high-fat meat food groups were frequently consumed. Findings from the current study partially support previous research that identified high-fat meat, sweet snacks, and salty snacks as the most common food groups consumed during binge episodes (Allison & Timmerman, 2007; van der Ster Wallin, Norring, & Holmgren, 1994). More specifically, study results are consistent with research indicating that binge episodes tended to begin with sweets and typically contained bread and sandwiches, cakes and buns, pasta, chocolate, and other sweets in a sample of predominantly White women with bulimia nervosa seeking inpatient eating

disorder treatment (van der Ster Wallin, 1994). The binge episodes in the current study also consisted of a variety of food items as found in research by Allison & Timmerman (2007). Furthermore, more than half of binge episodes in the current study contained items from starches and high-fat meat food groups. These findings support previous laboratory research with White and Black women seeking weight loss treatment indicating that those with BED and overweight tend to select food items high in carbohydrates and fats (Yanovski et al, 1992). Our findings suggest that food selection during binge episodes may slightly differ by ethnicity. This may be due to the social and cultural context in which binge episodes occur, including the symbolic meanings of food for Latino women (Cachelin et al., 2016; Shea et al., 2012). Food is seen as sacred and communicates abundance and hospitality within Latino culture (Shea et al., 2012) which may account for the wider array of foods present in binge episodes. Additionally, the increased prevalence of comorbid obesity and BED in ethnic minorities (Marques et al., 2011) and increased consumption of dessert and sweet snacks, dairy, and bread/pasta in women with BED and obesity (Yanovski et al., 1992; Raymond et al., 2007) could also account for some differences in food selection in binge episodes for ethnic minorities.

The most predominant food groups were Mexican food, in line with our hypotheses that binges would include culturally relevant foods. Secondary to Mexican foods, sweet snacks and starches were also consumed in larger quantities compared to other food groups during the binge episodes. While Mexican food was not frequently consumed, it was consumed in larger amounts when present during a binge episode. These findings support our hypothesis that binge episodes would contain culturally relevant food items given our sample was comprised of approximately 40% of Latino

participants. Sweet snacks and starches were the most common predominant food groups; while high-fat meats were frequently consumed, they were not consumed in larger amounts during binge episodes. Results are partially consistent with research by Allison & Timmerman (2007) which found that high-fat meat, sweet snacks, and salty snacks were consumed in the largest amounts during binge episodes among a sample of predominantly White women with binge eating.

While some of our findings support previous research, there are important differences that may be due to variation in the assessment of binge episodes, inclusion criteria based on eating disorder diagnoses, and race and ethnicity of the sample. The current study utilized a diagnostic interview to identify individuals with full and subthreshold BED and BN which was not the case for some prior studies. Allison & Timmerman (2007) examined food intake during binge episodes utilizing phone screens and self-report food diaries to identify participants with binge eating behaviors. Yanovski and Sebring (1993) reported food intake on women with binge eating based on proposed BED criteria assessed by the Questionnaire on Eating and Weight Patterns and Binge Eating Scale to identify participants with BED. In addition, the current study included full and subthreshold BED and BN whereas most previous studies primarily included individuals with either BED (Allison & Timmerman, 2007; Cachelin et al., 2016; Johnson et al., 1995; Raymond et al., 2003; Yanovski & Sebring, 1993) or BN (van der Ster Wallin, 1994). Interestingly, Cachelin et al. (2017) found that meal patterns may differ by diagnosis of BED and BN among a sample of Latino woman. It is possible that diagnostic category may have also influenced food selection and meal pattern in the current study. Furthermore, the study was conducted in Southern California with a

sample consisting primarily of Latinos. Southern California has a large proportion of Latinos with Mexican heritage (Johnson & Sanchez, 2020) which may account for the presence of large portions of Mexican food during binge episodes. In contrast, prior research on food selection and meal patterns primarily reported findings based on samples of predominantly White participants (Allison & Timmerman, 2007; Yanovski et al., 1992).

Overall, we found food selection and meal patterns during binge episodes to be mostly consistent with prior research; however, differences were found in comparisons between Latino and non-Latino participants. These findings suggest that culturally relevant differences are likely present in food selection and meal patterns of binge episodes. Furthermore, they highlight the need to consider tailoring binge eating treatments to be culturally inclusive which may increase treatment utilization among Latinos. This is important as ethnic minorities are less likely to seek treatment and utilize mental health services (Reagan, Cachelin, & Minnick, 2017). Previous research has asserted that the lack of cultural adaptations may reinforce barriers to seek treatment and targeting cultural factors relevant to treatment for binge eating may increase treatment retention rates (Perez, Ohrt, and Hoek, 2016). Specifically, Perez, Ohrt, and Hoek (2016) argue that there is a lack of systemic guidelines for mental health providers when providing treatment for ethnic minorities, resulting in challenges to address treatment barriers which include “feelings of shame, feeling one should be able to control their eating, fear of stigma, lack of medical insurance, limited resources, and lack of confidence in health care providers” (Perez, Ohrt, & Hoek, 2016, p. 380). The contrasting findings in food selection patterns between our study with a ethnically diverse sample

and previous research with predominantly White samples demonstrate the importance of examining such patterns in diverse samples. Perez, Ohrt, and Hoek (2016) reported food as a specific treatment barrier that arose for Hispanic/Latino individuals in binge eating treatment. Specifically, the social and emotional context of food in Mexican and Latino culture was identified as a factor that affected their ability to manage their eating behaviors and treatment outcomes (Perez, Ohrt, & Hoek, 2016; Shea et al., 2012). Overall, our findings of culturally relevant food items during binge episodes can inform culturally inclusive interventions and treatment for ethnically diverse populations.

The current study has some limitations. One limitation is the small sample size as well as the size of the ethnicity groups. Differences in food selection and meal patterns during binge episodes between ethnic groups may not be fully represented due to the small sample size. The sample also consisted of predominately Latino women. Research with more participants of ethnic minorities would allow for further comparisons of key features of binge episodes. Additional research is needed with men and other racial/ethnic groups given the comparable rates of BED between men and women (Striegel-Moore & Franko, 2003) as well as increasing rates of binge eating among racial and ethnic minorities (Pike, Hoek, & Dunne, 2014). In addition, the current study included participants who were recruited for a binge eating treatment study; therefore, results may not generalize to individuals who are not seeking binge eating treatment. While we aimed to examine socioeconomic status (SES) and education levels, few participants (13.5%) reported their SES and education levels. Future studies should examine food selection patterns for racially and ethnically diverse adults of various SES and education backgrounds, as binge eating is more prevalent in ethnic minorities compared to Whites

(Marques et al., 2011) and obesity is a significant problem among ethnic minorities and individuals with low SES (Goode et al., 2016).

To our knowledge, this is the first study to examine food selection and meal patterns during binge episodes in ethnically diverse adults. Study findings are partially consistent with the limited previous research on food selection and meal patterns of binge episodes. We found that binge episodes most frequently occurred in the participants' homes and with dinner identified as the most common meal for Latino participants and lunch as the most common for non-Latino participants. We also found that binge episodes typically contained breads/grains/noodles and cheese followed by cookies, ice-cream, and chips. Mexican food, sweet snacks, and starches were eaten in the largest quantity during binge episodes. We also found differences in food selection for Latino and non-Latino participants. Results highlight that binge episodes may differ in terms of food selection and meal patterns among a sample of ethnic diverse adults. More research is needed to more thoroughly examine ethnic differences to aid in developing culturally sensitive treatment for binge eating. This will allow for effective interventions that reduce barriers to treatment among racial and ethnic minorities.

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