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The Impact of Childhood Sexual Abuse on Adulthood Eating Disorders: When Healthy Eating Becomes Unhealthy

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The Impact of Childhood Sexual Abuse on Adulthood Eating Disorders:

When Healthy Eating Becomes Unhealthy

by

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We the undersigned committee, having examined the submitted doctoral research project, "The Impact of Childhood Sexual Abuse on Adulthood Eating Disorders: When Healthy Eating Becomes Unhealthy" by Audryn Andreoli, M.S. hereby indicate its unanimous approval.

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Abstract

Title: The Impact of Childhood Sexual Abuse on Adulthood Eating Disorders:

When Healthy Eating Becomes Unhealthy

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The Centers for Disease Control and Prevention (CDC; 2020c) estimated

that approximately 3.7 million children experience childhood sexual abuse (CSA)

every year in the United States. CSA is a significant issue associated with negative

psychosocial and health-related outcomes, including eating disorders (Afifi et al.,

2017).

While there has been substantial research completed regarding CSA and

eating disorders, there is a significant gap in the literature regarding Orthorexia

Nervosa (ON) and CSA. The present study sought to determine whether CSA is a

risk factor ON and determine the relationship between frequency of occurrence of

CSA, sex, race, previous eating disorder diagnosis, and other significant stressors,

particularly COVID-19 and ON. Participants were 535 individuals who completed

an online questionnaire that assessed these variables. A Mann-Whitney analysis did

not find a significant difference in scores on the Eating Habits Questionnaire

(EHQ; Gleaves et al., 2013) among individuals with a history of CSA as compared

to individuals without a history of CSA; no significant differences in EHQ scores

were found among individuals who experienced CSA on two or more occasions

compared to individuals who experienced CSA on one occasion. A Mann-Whitney analysis confirmed that individuals previously diagnosed with an eating disorder, and those who previously received eating disorder treatment demonstrated higher ON symptomology severity. Mann-Whitney and one-way between groups ANOVAs revealed minimal-to-no group differences among sex, race, and age in EHQ scores, except for Caucasian/White individuals scoring higher than Asian/Asian American individuals. Lastly, an ANOVA revealed no significant findings between COVID-19 stressors and EHQ scores.

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Chapter 1

Introduction

Childhood sexual abuse (CSA) is a widespread, though preventable adverse childhood experience and public health concern that has been associated with a plethora of negative outcomes. The Centers for Disease Control and Prevention (CDC; 2020c) defined CSA as

>the involvement of a child (person less than 18 years old) in sexual activity
>
>that violates the laws or social taboos of society and that he/she does not
>
>fully comprehend, does not consent to or is unable to give informed consent
>
>to, or is not developmentally prepared for and cannot give consent to. (p. 1)

It is estimated that 1 in 4 girls and 1 in 13 boys experience CSA, and approximately 3.7 million children experience CSA every year in the United States (CDC, 2020c). Research showed that CSA is associated with both psychosocial and health-related outcomes, including psychiatric disorders and physical health diagnoses (e.g., depression, obesity, heart disease, and Human Immunodeficiency Virus; HIV; CDC, 2020c.; Hailes et al., 2019). CSA may also lead to behavioral consequences, including substance abuse, risky sexual behaviors, and increased risk for suicide or suicide attempts (Gray & Rarick, 2018; Hailes et al., 2019). Furthermore, CSA has been associated with adulthood eating disorders, including Anorexia Nervosa, Bulimia Nervosa, and Binge Eating Disorder (Afifi et al., 2017). Previous research examining the relationship between CSA and adulthood eating disorders has

identified CSA as a nonspecific risk factor for adulthood eating disorders (Seubert & Virdi, 2018). However, research has not focused on other disordered eating patterns, particularly Orthorexia Nervosa (ON). This research aims to address these limitations and provide additional information on the association between CSA and adulthood disordered eating. Our goal is to determine whether CSA affects the development of pathological eating in adulthood, which could help identify targets for clinical and prevention interventions. While research in the field has increased our understanding of CSA, critical gaps remain unaddressed. Through this research, we aim to improve our understanding of all aspects of CSA and contribute to efforts to prevent CSA and improve the health, well-being, and quality of life of those affected. CSA and its adverse outcomes are preventable; through research, we can work to reduce children's exposure to CSA and ensure safe, stable, and nurturing lives for children.

Chapter 2

Review of the Literature

Childhood Sexual Abuse (CSA)

According to Prevent Child Abuse America (PCAA; n.d.), CSA is defined as inappropriate exposure or subjugation of a child to sexual contact or behavior, including oral, anal, genital, buttock and breast contact. As discussed by the American Academy of Child and Adolescent Psychiatry (AACAP; 2014), CSA can occur in various settings, both within and outside the child's home, and with various potential perpetrators, including parents, siblings, friends, teachers, and strangers. In 2016, the World Health Organization (WHO) described that 1 in 5 women and 1 in 13 men reported a history of CSA.

While CSA is reported up to 80,000 times a year, it is estimated that the number of unreported cases reaches far beyond this number (AACAP, 2014). According to Darkness to Light (2015), it was estimated that 60% of children who are victims of sexual abuse will never make a report. Additionally, several factors impact reporting of CSA. For example, some victims may not define their experience as abuse, particularly if the perpetrator is another child (Sanjeevi et al., 2018). Moreover, males are significantly less likely to report sexual abuse and more likely to delay reporting by several years if they report at all (Sanjeevi et al., 2018). PCAA (n.d.) noted that while there is variation in the number of reported CSA cases, it was estimated that at least 20% of American women and between 5-

16% of American men have experienced some form of CSA. Moreover, the worldwide average prevalence of CSA was estimated to be 11.8% (Sanjeevi et al., 2018).

Moreover, racial and ethnic differences have been observed in prevalence statistics. The United States Department of Health and Human Services (HHS), Administration of Children and Families (ACF), Administration of Children, Youth, and Families (ACYF), and Children's Bureau (CB; 2013) reported in 2012 child abuse rates of 21% for African American, 1.2% for American Indian/Alaskan Native, 0.8% for Asian, 21.8% for Hispanic, 4.7% for Pacific Islander, 8.2% for White, and 10.8% for multiracial children. Furthermore, despite both girls and boys being vulnerable to sexual abuse, it was reported that girls experience sexual abuse at higher rates. Specifically, it was estimated that 1 in 7 girls and 1 in 25 boys will be sexually abused before the age of 18 (Townsend & Rheingold, 2013). Sanjeevi et al. (2018) suggested the global prevalence rate of CSA for boys to be between 7.6 and 8.0% and between 15.0 and 19.7% for girls. Given these prevalence rates, CSA is a widespread problem.

CSA Risk Factors

Several theories attempt to explain the risk of sexual abuse victimization of children. Many of these theories describe the characteristics of victims of CSA; however, it is important to note that victims do not cause their sexual victimization. Cohen and Felson's (1979) routine activities theory suggests that children's

activities result in environments or situations in which they may come in contact with potential perpetrators. Therefore, when children engage in certain activities, their risk for victimization inadvertently increases (Cohen & Felson, 1979). Within this theory, victimization occurs when children are in close proximity to potential perpetrators who view the children as attractive targets, and there is inadequate supervision of victims. However, this theory does not account for other forms of victimization where family members and acquaintances are perpetrators. Moreover, children can be victimized without engaging in activities that lead to risky environments (Assink et al., 2019).

Others have enhanced the routine activities theory by focusing on environmental factors that may lead to child victimization. Finkelhor and Asdigian (1996) suggested a lack of guardianship as one environmental condition that may result in child victimization. In this perspective, inadequate guardianship is an environmental factor that increases the risk for victimization; this factor is not a problem of children's activities, per se. Instead, within this theory, there is a focus on child characteristics that are compatible with the offender's needs, motives, and/or reactions that increase a child's vulnerability. This theory focuses on characteristics including target vulnerability, or characteristics that may obstruct a child's ability to resist or deter victimization; target gratifiability, or characteristics of the child that an offender seeks; and target antagonism, or characteristics that

stimulate anger, jealousy, or damaging impulses of the offender (Finkelhor & Asdigian, 1996).

While both theories above emphasize environmental factors that contribute to child victimization, they cover few environmental components. Thus, Belsky (1980) suggested that victimization is influenced by the interaction of risk and protective factors, including parental history that affects parenting role and the family; microsystem factors, or characteristics of the child and family; exosystem factors, including parental employment, community, and social support; and macrosystem factors, including societal attitudes toward children and maltreatment. Thus, both distal and proximal ecological factors can interact to increase vulnerability to CSA (Belsky, 1980). Building on this ecological theory, Cicchetti and Rizley (1981) suggested transactional patterns, the interaction between the child's characteristics and environmental factors, are influenced by potentiating and compensatory factors that may increase or decrease a child's risk.

A more recent theory by Bolen (2001) combines ecological, transactional, and developmental theories and suggests that a child's developmental age is related to the risk of abuse. Thus, a child's maturity level is related to risk, and risk may increase or decrease over time (Bolen, 2001). These theories serve as the basis for research on CSA risk factors and illustrate the wide range of risk factors (e.g., child characteristics, environment, community). Thus, understanding the risk factors for CSA is key in the treatment and prevention of CSA.

One of the largest suggested risk factors for CSA has been identified as prior victimization of the victim and/or the victim's family members, including siblings and parents (Assink et al., 2019; Black et al., 2001). Additionally, prior victimization with other forms of abuse and within the child's home environment was included in this finding. A variety of parental problems and difficulties have also been identified as risk factors. These include intimate partner violence between the victim's parents, parental relationship problems, parental substance abuse, parental psychiatric, mental, and/or physical problems, and low parental education level (Black et al., 2001). Prior parental abuse may be considered a parental problem and difficulty as it may imply unresolved trauma or attachment-related issues (Assink et al., 2019). Within parental problems and difficulties, low quality parent-child relationships, including low parental attachment, parental overprotection, low levels of parental care and affection, and low parenting competence, have also been identified as risk factors. It is estimated that 30% of parents with personal histories of maltreatment display abusive parenting strategies with their own children (Khan & Renk, 2018).

Risk factors outside of the victim's nuclear family have also been recognized. Among these are children raised within non-nuclear families and with a stepfather. Additionally, other family risk factors include issues with family functioning, child or family social isolation, and low family socioeconomic status (Assink et al., 2019). For example, girls raised in families with incomes equal to or

below the poverty line are at increased risk for CSA (Sanjeevi et al., 2018).

Alternatively, children whose mothers possess an education beyond 12 years are at

a decreased risk for CSA. Moreover, six or more family relocations was identified

as a risk factor. Lastly, risk factors pertaining to child problems/characteristics

include physical or mental chronic conditions, drug use or delinquent behaviors,

female gender, low levels of social skills, and frequency of internet use (Assink et

al., 2019). Among the risk factors listed above, factors related to parents, the

family, or the parent–child relationship are among the strongest and most important

risk factors for CSA. Additionally, a variety of child-related risk factors are

strongly associated with CSA.

The routine activities theory may explain the risk factors of low levels of

parental care and child social isolation; children who spend large amounts of time

alone may receive lower levels of parental supervision that may not protect the

child from CSA. Moreover, low levels of parental care may suggest lower levels of

internet supervision, which may lead to susceptibility to sexual soliciting via the

internet and, in turn, increase the risk for CSA (Assink et al., 2019). Alternatively,

greater warmth, love, and affection demonstrated by primary caregivers during

childhood were linked to lower CSA risk (Sanjeevi et al., 2018).

Socially isolated families may have reduced connections to social networks

that may prevent CSA. Among other guardianship factors are those parents who

struggle with substance addictions, parental conflicts, and mental health problems.

These parents may be preoccupied with their own problems, and therefore inadequately supervise their child, thus increasing CSA risk. Similarly, parents with personal histories of CSA may have trauma-related issues that hinder their parenting abilities, thus reducing supervision and increasing CSA risk (Assink et al., 2019). For example, a mother's unresolved trauma history may contribute to inconsistent caregiving behaviors, withdrawing, affective communication errors, and hostile behaviors, which in turn negatively impact their children (Enlow et al., 2014). Importantly, parents diagnosed with Posttraumatic Stress Disorder (PTSD) increase their children's risk for psychopathology, including PTSD subsequent to trauma exposure (Enlow et al., 2014). To elaborate, infant attachment to the mother is a critical process in a child's ability to develop self-regulatory skills. Parents with histories of maltreatment demonstrate increased poor attachment relationships with their children (Khan & Renk, 2018). Thus, disruptions to the attachment relationship (i.e., parental PTSD) interfere with the child's ability to learn to self-regulate, later increasing the child's risk to develop PTSD post trauma exposure (Enlow et al., 2014). On the other hand, overprotective parents may propagate a child's self-view as weak and helpless, which in turn may limit their perceived ability to defend themselves against a perpetrator.

A child's female gender serves as a risk factor (Black et al., 2001) as most sexual abuse occurrences are perpetrated by heterosexual males with a preference for girls. Thus, female gender may increase target suitability and gratifiability

(Assink et al., 2019). Factors that may increase target vulnerability include a child's low social skills and physical or mental chronic conditions; these children may be less able to avoid dangerous situations or seek help, or they may be isolated from peer groups who may aid in help-seeking. Black et al. (2001) noted children of lower intelligence and academic functioning are at increased risk for CSA. Children who engage in substance misuse and delinquent behaviors may pursue high-risk situations with little supervision in which violence is more likely to occur.

Non-nuclear family systems may increase the risk for CSA by exposing children to unrelated and/or more predators due to larger social networks, parental dating, and frequent relocations. Children living with only one biological parent are at increased risk for CSA (Black et al., 2001). Alternatively, familial disruption may contribute to the development of dysfunctional interpersonal patterns characterized by escalation of conflicts and higher-risk situations. Prior victimization poses a significant risk factor through various pathways. First, children may live within a home environment that is high in victimization. In turn, this home environment may set the foundation for subsequent victimization. Alternatively, family disturbance and hardship may increase the risk for CSA through reduced supervision, emotional deprivation, and contact with various potential perpetrators. Lastly, child characteristics, including temperament and disabilities, may increase the burden on caregivers or provoke negative feelings in caregivers and increase the risk of CSA (Assink et al., 2019).

Impact of CSA

CSA can result in long-lasting emotional and behavioral difficulties (AACAP, 2014). AACAP (2014) noted that children exposed to such abuse are not prepared to cope with the overstimulation; thus, they will likely develop distressing feelings, thoughts, and behaviors in response to the abuse. Adult victims of CSA are likely to cope with the abuse by utilizing denial, self-blame, self-isolation, and emotional suppression (Sanjeevi et al., 2018). Common responses to CSA include low self-esteem, feelings of worthlessness, mistrust, and suicidality (AACAP, 2014).

Finkelhor and Browne (1985) suggested the traumagenic dynamics theory of CSA, noting traumatic sexualization, betrayal, powerlessness, and stigmatization contribute to trauma. These four factors contribute to maladaptive coping mechanisms, feelings of loss, grief, loss of control, suicidal behavior, and depression. These individuals also experience avoidance symptoms, such that they may resort to avoidance behaviors (e.g., substance use and suicide) to avoid dealing with the trauma. Aldwin's (2007) sociocultural theory of coping further elaborated on cultural differences in coping responses to CSA. Boys and girls may cope differently based on social and gender roles; cultural norms, family, context, race, and ethnicity may also impact coping (Gray & Rarick, 2018).

It has been proposed that the type and severity of abuse are associated with the development of psychopathology in children. Abuse characterized by anal,

vaginal, or oral penetration may be more severe while fondling and non-contact abuse (e.g., exhibitionism, forced exposure to pornography or sexual acts, etc.) may be less severe (Sanjeevi et al., 2018); these more severe acts have stronger associations with psychological distress. Furthermore, greater proximity within the abuser-victim relationship may lead to greater symptomatology and psychological distress. Additionally, support networks and gender are implicated in the impact of CSA on victims (Gray & Rarick, 2018).

Sanjeevi et al. (2018) noted female victims of CSA are at an increased risk for revictimization, including other forms of abuse such as physical abuse and neglect, while male victims are more likely to demonstrate problematic behaviors. The age of abuse is also implicated in the impact of CSA. Younger age of abuse is suggested to predict poorer outcomes, including revictimization, hospitalizations for suicide, and sexually transmitted diseases (Sanjeevi et al., 2018).

Negative self-attributions related to CSA (e.g., shame and self-blame) may lead to increased negative mental health outcomes. Women with CSA histories are more likely to report increased feelings of shame, which has been associated with higher levels of psychological distress (Sanjeevi et al., 2018). Alternatively, victims able to recognize the exploitative nature of CSA may be more likely to display long-term adjustment.

Impact of CSA on Mental Health

CSA has been linked to various mental health diagnoses in adulthood,

controlling for family background. Children with histories of CSA are at a greater risk for emotional dysregulation, contributing to a higher risk for psychological disorders and maladaptive coping (i.e., self-harming behaviors, substance abuse, risky sexual behaviors; Gray & Rarick, 2018; Hailes et al., 2019). Adult victims of CSA are at increased risk of developing PTSD (Grose et al., 2019; Sanjeevi et al., 2018). These individuals may report increased hyperarousal, avoidance, and intrusion symptoms compared to individuals without a history of CSA.

Increased risk for depressive symptoms and panic episodes have been found in women with a history of sexual abuse (Khan & Renk, 2018). Additionally, anxiety disorders occur more frequently in individuals with sexual abuse histories (Hailes et al., 2019; Hunter, 2006). The severity of the abuse is a predictor of long-term symptoms contributing to an increased risk of functional impairment due to these disorders (Gray & Rarick, 2018). CSA has also been linked with the development of personality disorders, including Borderline Personality Disorder (BPD). Within BPD, CSA histories significantly predict suicidal ideation and the number of suicide attempts. Male victims of CSA have demonstrated an 8.5% risk and females a 4.3% risk of developing a personality disorder (Sanjeevi et al., 2018).

Suicide risk and CSA have demonstrated strong correlations, with CSA victims demonstrating repeated suicide attempts and increased suicidal ideation. Gray and Rarick (2018) found that girls who experienced CSA were more likely to experience suicidal ideation than boy victims of CSA. Victims of CSA are at

increased risk for substance abuse (Hunter, 2006). Additionally, CSA significantly

predicted the early onset of substance use in adolescents (i.e., cigarettes, cannabis,

and alcohol) and adulthood dependence on alcohol and illicit drugs. Gray and

Rarick (2018) found that boys who experienced CSA were more likely to report

substance use than girl victims of CSA. It was suggested that substance use is

utilized as a coping mechanism that may lead to long-term negative coping (Gray

& Rarick, 2018).

Impact of CSA on Social Functioning

Individuals with CSA histories report lower satisfaction within intimate

relationships and poorer couple adjustment in long term relationships (Sanjeevi et

al., 2018). Women with histories of CSA reported reduced romantic relationship

adjustment and dyadic consensus. Moreover, adults with CSA histories are more

likely to have unstable intimate relationships.

Parenting relationships may also be impacted by parental history of CSA.

CSA may impact self-perceived parenting skills and the quality of parent-child

relationships. Particularly, mothers with CSA histories reported difficulties with

parental cohesiveness, communication, and parenting self-esteem as well as

decreased self-perceived parenting competence. Moreover, they are more likely to

develop permissive parenting practices and may display difficulties establishing

clear behavioral expectations, consistent discipline, and structured guidance.

Alternatively, these mothers may be more likely to utilize corporal punishment.

Moreover, mothers with histories of CSA are at an increased risk for physically abusing their children, though this relationship is mediated by maternal anger towards others (Sanjeevi et al., 2018). Mothers with CSA histories are more likely to report decreased relationship satisfaction, which may contribute to role reversal in which they develop an emotional overdependence on their children. Additionally, these mothers reported less positive relations with their children and lower levels of adjustment in their children; this was partially mediated by the effect of maternal anxiety and depression has on the relationship.

Impact of CSA on Sexual Health and Functioning

The sexual well-being of victims of CSA may be negatively impacted in a variety of ways. CSA victims may demonstrate hypersexuality (i.e., pathological sexual behavior that is repeated and high risk), which was suggested as a coping mechanism utilized for emotional regulation (Gray & Rarick, 2018). These individuals are at an increased risk for engaging in high-risk sexual behavior, including risky sexual partners and prostitution, as well as for contracting Sexually Transmitted Diseases (e.g., HIV; Hailes et al., 2019). Particularly, these individuals have been associated with engaging in unprotected sex with casual partners, exchanging sex for drugs, and a higher number of arrests for prostitution charges. They are more likely to be victims of sexual assault as adults, initiate consensual sexual activity at an earlier age, and possess a higher number of sexual partners (Hunter, 2006; Sanjeevi et al., 2018).

Individuals with a history of CSA may experience difficulty in achieving

sexual arousal (Pulverman et al., 2017; Sanjeevi et al., 2018). Furthermore, women

with histories of CSA reported more sexual dysfunction than the general

population. Women with CSA histories reported lower body esteem regarding

sexual attractiveness and lower levels of physiological and subjective arousal while

experiencing higher levels of sexual aversion and pain during sexual activity.

Victims of intrafamilial CSA reported experiencing various sexual difficulties (e.g.,

sexual pain disorders, low sexual interest or pleasure, flashbacks of abuse during

sexual situations, etc.).

Healthy Eating

Healthy eating recommendations are founded on concerns related to health

conditions, including heart disease and cancer (Skerrett & Willett, 2010).

Previously, healthy eating focused on preventing nutrient deficiency by achieving

recommended daily allowances for essential nutrients. Today, healthy eating

includes a focus on both dietary insufficiencies and excesses. For example,

carbohydrates have been shown to have adverse metabolic consequences (Willett &

Stampfer, 2013). Consequently, overweight individuals with sedentary lifestyles

were suggested to limit their carbohydrate intake. Research emphasized consuming

whole-grain, high-fiber, and less-refined carbohydrates, which were shown to

reduce cardiovascular diseases and type 2 diabetes (Mellen et al., 2008).

Trans fats from hydrogenated oils were associated with increased risk for cardiovascular disease, type 2 diabetes, and weight gain (Mozaffarian et al., 2006). Alternatively, saturated fats consumed in moderation, along with monosaturated and polyunsaturated fats, are essential for cardiovascular health (Skerrett & Willett, 2010). Furthermore, specific sources of protein were recognized as more important than total protein consumption. It was recommended that a healthy diet consists mainly of fish, nuts, and poultry and limits the consumption of red meat.

Skerrett and Willett (2010) stated healthy dietary patterns composed of whole-grains, legumes, vegetables, and fruits were widely supported. Vegetables and fruits demonstrated various health benefits, including protection against cardiovascular disease and age-related vision loss. Skerrett and Willett (2010) also discussed the importance of limiting refined starches, red meat, full-fat dairy products, and added sugars. Thus, including a wealth of vegetables and fruits in a healthy diet and reducing the intake of dairy products, salt, refined starches, sugars, and alcohol was indicated (Willett & Stampfer, 2013).

Dietary Guidelines for Americans

The Dietary Guidelines for Americans are based on current scientific knowledge of food and nutrition (HHS & United States Department of Agriculture [USDA], 2015). The guidelines are updated and published every five years to advance current food-based knowledge and promote health within the United States (HHS & USDA, 2015). While the guidelines provide recommended eating patterns,

they can be adapted for each individual's needs and preferences. Moreover, 12

different calorie levels are provided within the guidelines due to calorie needs

varying based on age, sex, height, weight, and level

of physical activity.

Eating patterns, the combination of consumed foods and beverages, play an

important role in overall health status and disease risk (HHS & USDA, 2015). The

2015 – 2020 Dietary Guidelines for Americans outlined key recommendations for

healthy eating patterns (HHS & USDA, 2015). These included consuming various

vegetables, fruits, grains, fat-free or low-fat dairy, protein foods, and oils.

Moreover, the guidelines called for limiting saturated and trans fats, added sugars,

and sodium as well as consuming alcohol in moderation.

The guidelines emphasized the need to advance healthy eating patterns

rather than individual nutrients, foods, and food groups given that foods are not

consumed in isolation but in combinations that interact with one another (HHS &

USDA, 2015). Thus, the guidelines divided foods into food groups and outlined

nutrients provided by each group as well as considerations for each food group.

These groups included vegetables, fruits, grains, dairy, protein foods, and oils. The

guidelines recommended consuming these foods in their nutrient-dense forms, or

without added sugars and in the leanest and lowest fat forms (HHS & USDA,

2015). Additionally, considerations for other dietary components, including added

sugars, saturated fats, trans fats, cholesterol, sodium, alcohol, and caffeine, were discussed.

Apart from the guidelines, the HHS (2017) suggested eight healthy eating goals. Firstly, the HHS suggested consuming red, orange, and dark-green vegetables in addition to other vegetables within one meal; they noted half of one's plate should include fruits and vegetables. The HHS stated by increasing vegetable and fruit intake, one can obtain healthy vitamins, minerals, and fiber. Secondly, the HHS suggested consuming whole grains rather than refined-grain foods (e.g., whole-wheat instead of white bread). The HHS noted one half of one's grain intake should consist of whole grains. Thirdly, the HHS suggested consuming fat-free and/or low-fat (1%) milk, given the lower caloric and saturated fat content.

The HHS (2017) also suggested electing for various lean protein foods, including 90% or higher lean ground beef, turkey breast, or chicken breast. Additionally, the HHS suggested electing for lower or no sodium foods. Another goal suggested by the HHS (2017) included drinking water or unsweetened beverages rather than sugary drinks. Instead of consuming soda and energy drinks, which serve as major sources of added sugars and calories, one should opt to add lemon, lime, watermelon, or a splash of 100% juice to water for flavor. Additionally, the HHS recommended consuming at least eight ounces of seafood a week. Seafood, which includes fish and shellfish, is composed of protein, minerals, and omega-3 fatty acids, known as the heart-healthy fat. Lastly, the HHS (2017)

suggested eating fewer solid fats, including cakes, cookies, desserts, pizza, and processed and fatty meats.

The HHS (2017) also provided tips for reducing fat, salt, and sugar. These included electing for baked or grilled rather than fried foods and utilizing herbs and spices rather than salt to flavor food. Additionally, portion control was emphasized. The HHS suggested individualizing caloric intake based on individual needs determined by weight.

Other Healthy Eating Perspectives

In 2013, the American Heart Association (AHA) and American College of Cardiology (ACC) published the Guideline on Lifestyle Management to Reduce Cardiovascular Risk (Horn et al., 2016). This guideline utilized evidence-based recommendations for healthy eating. The guideline suggested consuming high nutrient densities while maintaining energy content within recommended ranges per body weight; thus, caloric intake should be individualized. Caloric levels should be calculated based on age and level of physical activity. A variety of caloric eating patterns based on nutritional needs were provided within the guideline; these patterns delineated the daily amount of foods within each food group. The guideline suggested consuming nutrient-rich foods, including minerals, protein, whole grains, and other nutrients (Horn et al., 2016).

The AHA and ACC emphasized dietary pattern included various fruits and vegetables, whole grains, low-fat dairy products, skinless poultry and fish, nuts and

legumes, and non-tropical vegetable oils. Moreover, the guideline suggested

limiting saturated fat and trans-fat, sodium, red meat, sweets, and sugar-sweetened

beverages (Horn et al., 2016). Additionally, alcohol intake was suggested at no

more than one drink per day for women and two for men. The guideline suggested

consuming a variety of vegetables and fruits without high-calorie sauces or added

salt and sugars, as well as selecting fiber-rich whole grains for most grain servings.

Moreover, the guideline noted foods should be prepared without added saturated fat

and trans-fat. When consuming meat, the guideline recommended selecting lean

cuts. The guideline indicated consuming a variety of fish at least twice weekly,

particularly fish containing omega-3 fatty acids. Moreover, the guideline suggested

selecting fat-free and low-fat (1%) dairy products.

Eating Disorders

The American Psychiatric Association's (APA) Diagnostic and Statistical

Manual of Mental Disorders 5th Edition (DSM-5; 2013) described feeding and

eating disorders as:

> Persistent disturbance of eating or eating-related behavior that results in the
>
> altered consumption or absorption of food and that significantly impairs
>
> physical health or psychosocial functioning. (p. 329)

Among this class of disorders are Anorexia Nervosa (AN), Bulimia Nervosa (BN),

and Binge Eating Disorder (BED). Within feeding and eating disorders, only one

diagnosis within this class of disorders can be given during a single episode. This

approach was based on the significantly different clinical course, outcome, and treatment needs of each disorder despite similar psychological and behavior characteristics (APA, 2013). It should be noted, obesity was not included within this class of disorders as it is not considered a mental disorder but rather a result of long-lasting excess consumption in relation to energy expenditure. Nonetheless, obesity is associated with various mental disorders, including BED.

Historically, eating disorders were known as disorders that mostly affected Western women. Moreover, prevalence rates of eating disorders among minority women are unavailable due to the historical view that white women are more likely to meet criteria for eating disorders. However, recent research suggested prevalence rates of eating disorders are rising in both Western and non-Western countries and occur among all ethnic individuals at similar rates (National Eating Disorders Association; NEDA, n.d.a). The typical age of onset was suggested to be between 10 and 30, and there is a female to male ratio of 10:1 for AN and BN (Seubert & Virdi, 2018). Importantly, eating disorders demonstrated high mortality rates: AN claims 5.1% per 1,000 persons per year and BN 1.74% per 1,000 persons per year.

Anorexia Nervosa (AN)

The APA (2013) defined AN as maintaining significantly low body weight, intense fear of weight gain, and disturbance in experience and significance of body weight or shape. Thus, those with AN often demonstrate substantially low body weight in relation to expected weight based on demographics (Seubert & Virdi,

2018). The DSM-5 included two subtypes of AN. Restricting type (AN-R) described those who achieve weight loss through dieting, fasting, and/or excessive exercise and have not engaged in binge eating or purging behaviors during the last three months (APA, 2013). Binge-eating/purging type (AN-BP) described those who achieve low weight through binge eating or purging behaviors in the last three months.

Moreover, the severity of the disorder is based on BMI, ranging from mild (BMI ≥ 17) to extreme (BMI <15). In comparison, a BMI between 18.5 to 24.9 is recognized as expected weight (Seubert & Virdi, 2018). Afifi et al. (2017) reported a lifetime prevalence of AN at 0.8%, similar to the National Comorbidity Survey Replication at 0.6% (Hudson et al., 2007). More recent population-based data based on the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC-III) estimated a lifetime prevalence of AN at 0.8% (Udo & Grilo, 2018).

AN occurs more often in females than in males (10:1). AN typically develops during adolescence or early adulthood, often triggered by a stressor (Seubert & Virdi, 2018). Mortality (5%) due to AN often occurs as a result of suicide or medical complications. Moreover, AN often contributes to both medical and psychological health complications, including hypotension and depression. Moreover, individuals with AN often reported low self-esteem and interpersonal challenges. Distorted views of the self often are present for these individuals, which contributes to the cycle of AN. The fear of weight gain is central to AN; thus,

behaviors such as restricting provide a sense of control and ultimately self-protection (Seubert & Virdi, 2018).

Bulimia Nervosa (BN)

BN was defined by the APA (2013) as recurrent episodes of binge eating occurring at least once a week for three months, with an accompanying sense of lack of control over eating, consuming an amount of food that is significantly larger than most individuals would consume within a discrete time period, and repeated compensatory behaviors, such as self-induced vomiting and fasting, to prevent weight gain. Moreover, self-evaluation is excessively influenced by body shape and weight, and binge eating and compensatory behaviors do not occur exclusively during episodes of AN (APA, 2013). The severity of the disorder is based on the frequency of episodes of compensatory behaviors, ranging from mild (1-3 episodes) to extreme (14 or more episodes). Afifi et al. (2017) reported a lifetime prevalence of BN at 0.2%, less than the National Comorbidity Survey Replication at 1.0% (Hudson et al., 2007). More recent population-based data based on the NESARC-III estimated a lifetime prevalence of BN at 0.28% (Udo & Grilo, 2018).

Compensatory behaviors (e.g., vomiting) can lead to several medical problems for these individuals, including gastric rupture and cardiac arrhythmias (APA, 2013). Similarly to AN, BN occurs more frequently in females than males (10:1; Seubert & Virdi, 2018). Onset typically occurs in adolescence or early adulthood. Mortality rates were estimated between 0% to 3.9%. It was proposed

that bingeing and purging behaviors are efforts to overcome overwhelming emotions related to previous negative experiences.

Binge Eating Disorder (BED)

The APA (2013) defined BED as recurrent episodes of binge eating characterized by a sense of lack of control over eating and consuming an amount of food that is significantly larger than most individuals would consume within a discrete time period without accompanying compensatory behaviors. Binge eating episodes occur at least once a week for three months and are accompanied by eating more rapidly than normal, feeling uncomfortably full, eating large amounts of food despite lacking feelings of hunger, eating alone due to embarrassment stemming from the amount of food being consumed, and/or feelings of disgust, depression, and guilt subsequent to eating (APA, 2013). The severity of the disorder is based on the frequency of binge eating episodes, ranging from mild (1-3 episodes) to extreme (14 or more episodes). Afifi et al. (2017) reported a lifetime prevalence of BED at 0.8%, less than the National Comorbidity Survey Replication at 2.8% (Hudson et al., 2007). More recent population-based data based on the NESARC-III estimated a lifetime prevalence of BED at 0.85% (Udo & Grilo, 2018).

BED often contributes to feelings of disgust and mental health concerns, including depression and anxiety, which further fuel bingeing behaviors. BED occurs more often in males than is seen in AN and BN, with a female prevalence

rate of 1.6% and a male prevalence rate of 0.8% (APA, 2013). BED development often begins in adolescence or early adulthood. Negative consequences of BED include social challenges and lower quality of life (Seubert & Virdi, 2018). Moreover, individuals with BED often experience weight gain and obesity. Binge behaviors with BED are perceived as control methods protecting against feelings such as shame and vulnerability as well as reduction of emotional activation.

Obesity. The CDC (2020b) defined adult obesity as a Body Mass Index (BMI) of 30.0 or higher. BMI can be calculated by dividing an individual's weight in kilograms by the square of height in meters. It is utilized as an indicator of body fatness, and while it does not measure body fat directly, it has been shown to moderately correlate with other measures of body fat. The measurement of obesity through the use of BMI can be further broken down into three categories, including class 1 (BMI of 30 to <35), class 2 (BMI 35 to <40), and class 3 (BMI of 40 or higher). In 2015-2016, the prevalence rate of obesity in the United States was estimated at 39.8% among adults and 18.5% among youth (Hales et al., 2017).

Orthorexia Nervosa

Orthorexia Nervosa (ON), a recently proposed eating disorder, is characterized by a fixation with eating healthy ($N = 275$; Dunn et al., 2017). When healthy eating instructions become a fixation for the individual, the difficulties and symptoms observed with other eating disorders become an influence for individuals in this proposed category. While ON was not included as a distinct disorder in the

DSM-5, some studies have suggested specific diagnostic criteria for ON. For example, Moroze et al. (2015) proposed the following diagnostic criteria: the presence of obsessional preoccupation with eating healthy foods with a focus on quality and composition of foods (Criteria A) accompanied by two additional symptoms.

Potential accompanying symptoms include unbalanced nutrition due to a preoccupation with food purity, preoccupation and worries about consuming impure or unhealthy foods with the effect of food quality and composition on health, avoidance of foods perceived as unhealthy, excessive time spent reading about, acquiring, and preparing foods, feelings of guilt and worry subsequent to consuming unhealthy foods, intolerance to different food beliefs, or spending excessive money relative to one's income on food based on perceived quality (Moroze et al., 2015). Moreover, the food obsessions interfere with physical health due to nutritional imbalances or lead to clinically significant distress or impairment in social, academic, or vocational functioning.

All studies with suggested criteria for ON indicated three primary diagnostic criteria: obsessive or pathological preoccupation with healthy eating, emotional consequences of non-compliance to self-imposed nutritional rules, and psychosocial impairments in areas of life as well as malnutrition and weight loss (Cena et al., 2018; see Tables 1 - 4). Moreover, suggested criteria emphasized avoidance of foods considered unhealthy and positive effects of adherence to

healthy eating rules. ON is thought to result in social isolation, malnutrition resulting in severe medical conditions, substantial dietary restrictions, and affective instability (Brytek-Matera, 2012). Moreover, foods that contain significant amounts of fat, sugar, salt, or other unhealthy components are avoided, and food preparation becomes a vital part of the obsessive thoughts and compulsive behaviors.

While ON may appear similar to other eating disorders, it differs in that the preoccupation revolves around the quality of food rather than the quantity (Brytek-Matera, 2012). Moreover, it is believed that ON does not stem from a preoccupation with physical appearance but rather through other mechanisms, including a motivation to improve one's nutritional lifestyle. Furthermore, ON is thought to develop out of efforts to alter negative eating habits or increase positive eating habits to prevent or treat illnesses (Seubert & Virdi, 2018). While the goal appears to be enhancing quality of life, ON can result in various negative outcomes (e.g., malnourishment).

However, ON differs from healthy eating habits outlined above. Suggested diagnostic criteria emphasized individuals with ON follow restrictive diets based on needs or medical conditions the individuals do not possess (Setnick, 2013). Additionally, they may insist on the health benefits of such diets despite contradicting evidence. The preoccupations and beliefs about food demonstrate a dichotomous nature in which foods are perceived as either "all good" or "all bad," differing from suggested limitations of certain foods outlined in various healthy

eating guidelines. Moreover, the preoccupations and behaviors may contribute to malnourishment (Moroze et al., 2015); this is the opposite effect expected from following suggested dietary guidelines penned above. Moreover, the healthy eating guidelines set forth by individuals with ON are exaggerated, and emotional distress results from transgressions (Dunn & Bratman, 2016).

The lack of formal criteria for the diagnosis of ON has led to a debate regarding whether it is a standalone diagnosis or part of another condition, including Obsessive-Compulsive Disorder, addictions, or other eating disorders (Brytek-Matera, 2012). This debate is further fueled by the shared characteristics and consequences between ON and other disorders, namely AN and BN. ON and AN are similar in regard to the perfectionism, anxiety, need for control, and significance of weight loss aspects of the disorders (Seubert & Virdi, 2018). Nonetheless, those with ON are focused on being healthy and are often open about their non-sensible food beliefs. However, ON has been demonstrated as highly prevalent in individuals post-treatment for AN and BN ($N = 32$; Segura-Garcia et al., 2015). In essence, ON may be seen as the "more acceptable" eating style to manage both acceptance by familial support, as well as internal struggles on the individual in the maintenance stage of care.

Additionally, prevalence rates have been reported with great variance, likely as a result of the lacking psychometric properties of diagnostic measures, undefined formal diagnostic criteria, and cultural differences (Dunn et al., 2017). Missbach et

al. (2017) noted that prevalence rates have been reported at ranges between 6.9% to 88.7%. The most commonly used tools to assess ON are the Bratman Orthorexia Test (BOT) and the ORTO-15, yet both measures lack validity (Missbach et al., 2017). Moreover, most measures that have been created to assess ON have utilized international samples and were validated in languages other than English, further limiting their use on a U.S. sample. However, new, more psychometrically sound measures are being created to assess for ON (e.g., the Eating Habits Questionnaire; Gleaves et al., 2013). Studies on ON to date have focused mainly on university students, thus limiting their generalizability. Nonetheless, it has been reported that many professionals within the eating disorder field are aware of this condition and observe it within their practice (Vandereycken, 2011). Thus, ON should be addressed.

Eating Disorders and CSA

CSA was identified as a predisposing factor to psychiatric conditions, including eating disorders. Research indicates that stressful events are among the leading causes of eating disorders. Stress is perceived as a precipitator, reinforcer, and motivator of disordered eating. Adverse childhood experiences, particularly traumatic events (e.g., sexual abuse), are universally recognized as risk factors for the development of eating disorders (Seubert & Virdi, 2018). Patients with eating disorders reported a high incidence of childhood abuse, including sexual abuse (Dancyger et al., 2017). Jacobi et al. (2004) described clinical populations with

eating disorders reported significantly higher rates of CSA, including patients with AN and BN. Moreover, Johnson et al. (2002) reported that individuals with histories of CSA were at elevated risk of eating disorders and eating or weight problems. Reactions to CSA may present in disorders characterized by impulsivity, or a lack of behavioral control, among which are eating disorders (Estévez et al., 2019). Madowitz et al. (2015) noted that between 30% to 50% of individuals who reported a history of childhood physical or sexual abuse also presented with an eating disorder. Afifi et al. (2017) reported childhood maltreatment, particularly sexual abuse, is associated with increased odds of all eating disorders, including AN, BN, and BED, for both men and women. Moreover, Micali et al. (2017) reported in a population-based study that a history of CSA was associated with disorders with binge-eating behaviors, BN, BED, and subthreshold BN and BED among women in mid-life.

In a population-based study, Rayworth et al. (2004) reported that women with a history of eating disorder symptoms were twice as likely to report a history of CSA when compared with women with no eating disorder history; those women meeting DSM-IV criteria for any eating disorder were nearly three times as likely to report a history of CSA. Given the complexity of eating disorders, CSA likely interacts with various factors and may serve as an indirect risk factor to eating pathology (Mitchell et al., 2012).

Available population-based studies suggested a relationship between sexual abuse and increased likelihood of experiencing eating disorders (Afifi et al., 2017). Exposure to multiple traumas was positively associated with the severity of eating disorders (Arditte Hall et al., 2018). Backholm et al. (2013) reported that having a history of trauma exposure resulted in more severe eating disorder symptoms, greater secondary psychosocial impairment, psychiatric comorbidity, and negative self-image. Moreover, eating disorders were associated with elevated treatment costs, high rates of comorbidity with other mental disorders, and high mortality rates (Rayworth et al., 2004). Those exposed to childhood maltreatment with eating disorders demonstrated higher psychiatric comorbidity and suicidal tendencies compared to eating disorder patients who were not exposed to childhood maltreatment (Molendijk et al., 2017). Moreover, suicide was identified as a common cause of death in AN and BN individuals (Dancyger et al., 2017).

Mitchell et al. (2012) noted that the development of eating pathology subsequent to a sexual trauma may be the result of one's negative self-view, with the eating pathology serving as a means to correct one's negative perceived qualities or to minimize one's attractiveness to protect themselves against potential perpetrators. Rayworth et al. (2004) noted eating disorders may serve to regulate negative affect related to childhood abuse.

Anorexia Nervosa and CSA

CSA was identified as an early precursor of AN (Jacobi et al., 2004). Carter et al. (2006) reported patients with a history of CSA demonstrated significantly higher severity scores on measures of AN. AN-BP was linked with a history of CSA (Seubert & Virdi, 2018). Many studies suggested higher rates of CSA in individuals with AN-BP than those with AN-R. Sanci et al. (2008) reported CSA as predictive of purging behaviors. Moreover, Dancyger et al. (2017) discussed patients with AN-BP consistently reported higher rates of CSA compared to matched controls in the general population and matched counterparts with AN-R. CSA among individuals with eating disorders is less predictive of restricting or over-exercising symptoms seen in AN-R (Dancyger et al., 2017). Carter et al. (2006) reported 65% of patients diagnosed with AN-BP and 37% of patients diagnosed with AN-R reported a history of CSA.

Importantly, historical controversy surrounding the relationship between CSA and eating disorders, particularly AN, is likely a result of methodological differences, samples studied, and differences in definitions of CSA (Smolak & Murnen, 2002). When studies utilized CSA as the independent variable, correlations between CSA and eating disorders were much higher. Furthermore, Carter et al. (2006) concluded that the prevalence of CSA among patients with AN is high. Recent research suggested a transgenerational effect of traumatic events impacting the development of AN; traumatic experiences including sexual abuse

were shown to be more likely present in mothers of daughters with AN.

Bulimia Nervosa and CSA

CSA was demonstrated as a significant risk factor for the development of BN (Seubert & Virdi, 2018). It was reported that CSA is related to bulimic symptoms, particularly purging behaviors (van Gerko et al., 2005). In a National Comorbidity Survey-Replication Study, 40% of women with BN reported a history of sexual trauma (Mitchell et al., 2012). Moreover, Jacobi et al. (2004) identified CSA as an early precursor of BN. In a longitudinal cohort study, Sanci et al. (2008) reported that during adolescence, those reporting one episode of CSA were at 2.5 times higher risk of BN, and those reporting two or more episodes of CSA were at five times higher risk compared with females reporting no episodes.

Dancyger et al. (2017) discussed patients with BN consistently reported higher rates of CSA compared to matched controls in the general population and matched counterparts with AN-R. Moreover, CSA among individuals with eating disorders is more predictive of purging symptoms (Dancyger et al., 2017). In a meta-analysis, Molendijk et al. (2017) reported that exposure to childhood maltreatment was associated with a larger number of binge/purge episodes and a higher frequency of use of diuretics and laxatives. Fosse and Holen (2006) reported that patients meeting criteria for BN scored higher on a measure of sexual abuse; higher rates of CSA were found among patients with purging behaviors. Moreover,

in a meta-analysis, Caslini et al. (2016) reported a consistent and positive association between BN and CSA.

Binge Eating Disorder and CSA

Recent research indicated that all forms of childhood abuse, including sexual abuse, are associated with BED (Seubert & Virdi, 2018). Childhood maltreatment, including sexual abuse, demonstrated strong associations with eating disorders of the binge-purge subtypes (Molendijk et al., 2017). Moreover, in a study of eating-disordered women, van Gerko et al. (2005) stated a larger percentage of women reporting purging behaviors reported a history of CSA compared to women reporting no purging behaviors. Moreover, the women who reported a history of CSA demonstrated higher levels of objective bingeing, vomiting, laxative abuse, and diuretic abuse (van Gerko et al., 2005). Caslini et al. (2016) reported a consistent and positive association between BED and CSA. Binge eating may develop in reaction to sexual abuse and as a strategy for coping with the abuse (Caslini et al., 2016). Binge eating may be a display of a dissociative coping style that develops subsequent to CSA (Rayworth et al., 2004).

Dawes et al. (2016) found BED to be one of the most common mental health conditions among obese individuals. They also noted its frequency among these individuals was greater than in the general population. Hudson et al. (2007) reported a similar finding within the National Comorbidity Survey Replication, indicating a higher prevalence of BMI within the severely obese range among

individuals with BED. Moreover, CSA in female obese patients has been shown as an independent predictor for BED (Quilliot et al., 2019). However, despite high prevalence rates of binge eating among obese individuals, not all obese individuals meet criteria for BED.

Obesity and CSA. An increased risk of developing obesity was associated with childhood maltreatment, including sexual abuse (Danese & Tan, 2014; Hailes et al., 2019). CSA was found to double the likelihood of obesity in middle-aged women (Rohde et al., 2008). Additionally, O'Neill et al. (2018) reported that sexual maltreatment was significantly associated with adult obesity, with those reporting a history of sexual maltreatment having a greater probability and odds of obesity than those with no reported sexual maltreatment. Interestingly, those with a reported history of sexual maltreatment were 72% more likely to be extremely obese (class 3) in adulthood, compared to 27% class 1 obese (O'Neill et al., 2018).

Quilliot et al. (2019) reported that 11.3% of female and 2.8% of male obese patients ($N = 1156$) reported a history of CSA. Moreover, CSA as a risk for adulthood obesity was shown in various demographic groups. Boynton-Jarrett et al. (2012) demonstrated that black women with a history of child or teenage physical and sexual abuse were at 1.29 times higher risk of a BMI greater than 30. According to the CDC (2020a), obesity was associated with reduced quality of life, poorer mental health outcomes, and fatal health conditions, including diabetes,

stroke, heart disease, and some types of cancer. Thus, identifying contributing factors that can be modified is essential for effective treatment.

Orthorexia Nervosa and CSA

Various psychosocial risk factors were associated with ON. In terms of demographic risk factors, there are mixed findings regarding age. Some studies identified ON to be more common among younger individuals. For example, in a sample of Italian athletes, Segura-Garcia et al. (2012) found ON to be more common among younger adults ($N = 734$). Others, however, have suggested the risk of ON to increase with age. Varga et al. (2014; $N = 810$) found as age increased, ON did as well. Alternatively, higher quality studies did not find significant correlations between ON and age (Depa et al., 2017; $N = 446$). In terms of gender, findings were also mixed, with some studies suggesting higher rates in females (Parra-Fernandez et al., 2018; $N = 454$) and others suggesting higher rates in males (Karakus et al., 2017; $N = 208$). However, most studies of high quality suggested no relationship between gender and ON (Depa et al., 2017; Oberle et al., 2017; $N = 459$). Regarding familial SES and education level, results were mixed. However, some suggested as education level and income increase, the risk for ON also increases, potentially due to accessibility to high quality foods (Hyrnik et al., 2016; $N = 1899$).

Personality risk factors were also studied in relation to ON. Self-esteem was not found to correlate with ON; however, few studies examined this correlation.

Body dissatisfaction, however, showed mixed findings. Narcissism, perfectionism, neuroticism, and obsessive-compulsive tendencies were positively correlated with ON (McComb & Mills, 2019). Importantly, obsessive-compulsive tendencies were consistently correlated with greater risk for ON (Barrada & Roncero, 2018; $N = 942$). Additionally, pre-existing or a history of psychopathology was correlated with ON (Missbach et al., 2015; $N = 1029$). Particularly, current or past history of eating disorder was significantly correlated with developing ON (Brytek-Matera et al., 2015; $N = 52$; Segura-Garcia et al., 2015).

Furthermore, *drive for thinness* (Brytek-Matera et al., 2017; $N = 120$) and *internalization of a thin-ideal* (Eriksson et al., 2008; $N = 251$) were shown to correlate with ON. Moreover, eating habits, including avoiding certain foods, strict eating schedules, spending large amounts of time preparing food, restricting food intake, and consuming less saturated fats were indicated as risk factors for ON (McComb & Mills, 2019). Within these findings, mechanisms suggested to contribute to ON included preoccupation with fear of weight gain or clean eating as a trigger to preoccupation with weight and shape which is seen in other eating disorders.

To date, there is no research discussing the correlation between ON and CSA. Based on the significant correlation between ON and other eating disorders, as well as the significant correlation between CSA and eating disorders, further research is needed to determine whether CSA is a risk factor for ON.

Chapter 3

Rationale for Purposed Study

CSA is a global public health concern that negatively influences millions of individuals each year. CSA also has a significant economic impact as its total lifetime economic burden in the United States is estimated to be at least $9.3 billion (CDC, 2020c). Among the negative outcomes associated with CSA are eating disorders. Eating disorders account for the second highest mortality rate of mental health disorders (NEDA, n.d.b). The CDC (2020c) reported that 3.7 million children experience CSA every year in the United States, and between 30% to 50% of individuals who reported a history of childhood physical or sexual abuse also presented with an eating disorder (Madowitz et al., 2015).

While there has been significant research on the impact of CSA in relation to eating disorders, there is a noteworthy gap in the literature with regard to alternative maladaptive eating patterns, particularly ON. The current literature suggests CSA as a risk factor for later eating disorder pathology; however, there is a shortage of data available on the impact of CSA on ON. This research can offer a greater understanding of the impact of CSA on adulthood disordered eating with meaningful impacts for individuals, prevention efforts, and both medical and mental health providers. This would benefit individuals and families in understanding the adverse outcomes of CSA in an effort to increase prevention and contact with treatment providers.

The current lack of research on CSA and obsessive healthy eating is concerning. A better understanding of CSA as a risk factor for eating disorders is paramount to understanding risk factors, developing intervention strategies, and implementing prevention programs. Furthermore, research on this topic contributes to the mental health and medical providers' ability to be effective in working with eating disordered individuals, as increased insight into contributing factors to eating disorders will allow for more targeted therapeutic interventions. Past research has been somewhat inconsistent in identifying ON as a separate diagnostic category. The present study could further shed light on this diagnostic category and bring its existence and adverse effects into awareness for both individuals and mental health and medical providers.

Chapter 4

Goals and Objectives

The reviewed literature suggests that CSA is a significant issue associated with negative psychosocial and health-related outcomes. Research identified CSA as a risk factor for adulthood eating disorders. Therefore, establishing a connection between CSA and ON were relevant objectives for this study. An additional objective of this study was to determine whether there is a relationship between the frequency of occurrence of CSA and severity of ON. Another relevant objective for this study was to determine whether sex, racial, and age differences exist among individuals who meet criteria for ON. Another objective of this study was to determine whether receiving previous eating disorder treatment is associated with ON. A final objective of this study was to examine whether other significant stressors, particularly COVID-19, impact healthy eating behaviors.

The purpose of the current study was to expand the research on CSA and eating disorders to increase our understanding of how this adverse childhood experience contributes to long-lasting psychosocial and health-related concerns. This will increase our understanding of CSA as a risk factor for later mental health concerns and allow future research to elaborate on diagnostic clarity and effective interventions for ON. Additionally, results of this study may allow for the implementation of more targeted treatment addressing the comorbidities of CSA and eating disorders.

Chapter 5

Hypotheses

Based on the findings from the literature, the following hypotheses were proposed:

1. Individuals with a history of CSA will demonstrate a greater severity of ON symptomology.

2. Individuals who have experienced CSA on two or more occasions will demonstrate greater severity of ON symptomology.

3. History of an eating disorder will be a predictor of severity of ON symptomology.

4. History of eating disorder related treatment will be a predictor of severity of ON symptomology.

5. Stressful events have been proposed as prominent causes of disordered eating. Thus, in this study, we predict significant increases in healthy eating behaviors during COVID-19.

Chapter 6

Research Questions

1. The preceding literature review indicates mixed findings regarding sex differences and ON symptomology. However, a majority of studies to date suggest no significant sex differences. Based on these findings taken together, in this study we aimed to determine whether sex differences exist in severity of ON symptomology.

2. Eating disorders have historically been recognized as disorders that only affect white women. However, recent research suggests individuals of racial minorities suffer from eating disorders at similar rates to white individuals. Based on these findings, in this study we aimed to determine whether racial differences exist in severity of ON symptomology.

3. The preceding literature review indicates mixed findings regarding age and ON symptomology. However, higher quality studies to date suggest no significant age differences. Based on these findings taken together, in this study we aimed to determine whether age group differences exist in severity of ON symptomology.

Chapter 7

Method

Participants

Participants for this study included adults above the age of 18 residing in the United States. Participants were recruited through the internet, including social media and Listserv email distributions. All participants in this study were volunteers. Participants were limited to one survey completion per user.

Procedure

Participants responded to an online questionnaire using Qualtrics' online survey platform. Participants signed the informed consent and completed the survey electronically. Confidentiality was maintained by not asking participants to identify themselves on the questionnaire. Participants were able to respond to the survey in any setting in which they had access to a smartphone, tablet, or computer. Therefore, participants were not limited to location or setting to initiate a survey response. However, access to Wi-Fi, wireless mobile connection, or other internet connection sources was necessary for survey completion.

Materials

Survey

Demographic information, such as age, sex, and race, was obtained at the beginning of the survey. Additionally, participants answered questions regarding history of eating disorder diagnosis and treatment, changes in eating behaviors in

the past two months, frequency of CSA, and financial and occupational effects of COVID-19.

Adverse Childhood Experiences Questionnaire (ACE-Q)

Experiences of CSA were measured and defined using a question from the Adverse Childhood Experiences Questionnaire (ACE-Q). The ACE-Q is a 10-item questionnaire based on a decades-long study involving the effects of traumatic childhood experiences on subsequent physical, emotional, behavioral, and mental health concerns (Felitti et al., 1998). It was designed to measure 10 categories of adverse childhood experiences. The ACE-Q defined CSA as touching, fondling, forcing the victim to touch the perpetrator in a sexual way, attempts at or actual oral, anal, or vaginal sex by an adult or person at least five years older than a child under the age of 18. Thus, this definition was utilized in this study.

Eating Habits Questionnaire (EHQ)

The EHQ is a brief screening measure developed by David H. Gleaves, Erin C. Graham, and Suman Ambwani. This assessment was developed to identify symptoms of ON (Gleaves et al., 2013). It consists of 21 self-report items with three subscales: Problems, Knowledge, and Feelings. It was initially developed by surveying undergraduate students in a Southeastern U.S. university. During its development, the EHQ was found to be valid, efficient, and consistent in the identification of ON. The EHQ was shown to be reliable, with good internal consistency, with subscale alphas .90, .82, and .86 for the Problems, Knowledge,

and Feelings factors, respectively ($N = 213$; Gleaves et al., 2013). Additionally, test-retest reliability of the subscale scores was acceptable ($r = .81, .81$, and $.72$, respectively). Moreover, in the preliminary study, the EHQ demonstrated convergent, discriminant, and criterion-related validity. Subsequent studies utilizing the EHQ reported adequate internal consistency and evidence for convergent and divergent validity (Oberle et al., 2017; Zickgraf, 2019). It should be noted, there are limited studies examining the validity and reliability of the EHQ; thus, more research with further reliability and validity data is needed.

The EHQ screening questionnaire includes questions assessing for knowledge of healthy eating, problems associated with healthy eating, and feeling positively about healthy eating (Zickgraf, 2019). The Behaviors subscale has five items related to healthy eating behaviors (e.g., "I follow a health-food diet rigidly") and the Problems subscale has 12 items that assess for problems or impairments associated with healthy eating (e.g., "My healthy eating causes significant stress in my relationships"). The Feelings subscale includes four items that assess for positive feelings related to healthy eating (e.g., "I feel in control when I eat healthy;" Oberle et al., 2017). The items are ranked on a 1-4 Likert scale, with answers including "false, not at all true," "slightly true," "mainly true," and "very true." Scale and total scores are calculated by averaging the items for a possible range of 1–4.

Research Design and Plan of Analysis

Survey data were analyzed using the Statistical Package for Social Sciences (SPSS) software. Descriptive and frequency summary data were calculated to obtain demographic information for the sample used for this study. To determine whether a history of CSA predicted greater severity of ON scores, a Mann-Whitney analysis was used. To examine whether individuals who previously experienced CSA on two or more occasions demonstrated higher severity of ON, a Mann-Whitney analysis was used. A Mann-Whitney analysis was used to determine whether history of an eating disorder predicted severity of ON symptomology. To determine whether history of eating disorder related treatment predicted severity of ON symptomology, a Mann-Whitney analysis was used. A one-way between groups analyses of variance (ANOVA) was used to determine the relationship between COVID-19 stressors and changes in healthy eating behaviors. A Mann-Whitney analysis was used to determine whether sex differences exist in severity of ON symptomology. Lastly, separate one-way between groups ANOVA's were used to determine whether ethnic and age group differences exist in severity of ON symptomology.

Chapter 8

Results

Participants

Participants for this study were adults age eighteen or older. Participants were recruited through the internet, including social media (i.e., not-paid-for advertisements on Facebook) and email distributions to clinical psychology graduate students located in the United States. Participants were limited to one survey completion per user and were excluded from the study if they did not complete the survey, were under eighteen years of age, or did not accept the informed consent. 663 participants completed the survey. After checking for completeness, 128 participants were removed from data analysis due to incomplete survey responses, leaving a total of 535 responses ($N = 535$).

503 (94%) identified as female and 32 (6%) identified as male. Age groups were as follow: 39.8% 18-24 years, 38.1% 25-34 years, 11.2% 35-44 years, 7.1% 45-54 years, 2.6% 55-64 years, 0.9% 65-74 years, 0.2% 75-84 years, and 0.2% 85 years or older. Based on self-reported race, 468 (87.5%) were Caucasian/White, 22 (4.1%) were Biracial/Multiracial, 15 (2.8%) were Asian/Asian-American, 14 (2.6%) were Black/African American, 2 (0.4%) were American Indian/Alaska Native, and 14 (2.6%) identified as "other." There were 461 (86.2%) not Hispanic/Latino and 74 (13.8%) Hispanic/Latino participants. Participant demographic data are presented in Table 5.

Concerning eating disorder history, 64 (12%) participants reported previously being diagnosed with an eating disorder, and 39 (7.3%) reported previously receiving eating disorder specific treatment. In regard to previous inpatient hospitalization or related treatment, 45 (8.4%) participants reported receiving such treatment. It should be noted, participants may have responded to this survey question with hospitalizations unrelated to eating disorders but rather general medical concerns. As far as factors relating to CSA, 130 (24.3%) respondents indicated a history of CSA on the ACE-Q, of which 96 (17.9%) reported this occurring on 2 or more occasions while 33 (6.2%) reported this occurring on one occasion. The average EHQ score was 38.03 ($SD = 9.4$). Regarding changes in eating behaviors in the past 2 months, 167 (31.2%) participants reported no change, 156 (29.2%) reported a slight increase, 111 (20.7%) reported a slight decrease, 65 (12.1%) reported a significant increase, and 36 (6.7%) reported a significant decrease.

Regarding the occupational effects of COVID-19, 276 (51.6%) participants reported working from home, 115 (21.5%) reported no change, 64 (12.0%) reported lost employment, 41 (7.7%) reported being furloughed, and 39 (7.3%) reported working more. Lastly, regarding the financial impacts of COVID-19, 403 (75.3%) participants reported no changes and 132 (24.7%) reported changes in their ability to purchase their preferred foods.

Statistical Analysis

Hypothesis 1

For the present study, it was hypothesized that individuals with a history of CSA would demonstrate greater severity of ON symptomology. A Mann-Whitney test indicated that EHQ scores were not significantly different for individuals with a history of CSA (M_{rank}= 279.21) and those who did not have a history of CSA (M_{rank} = 264.40), U = 24867.50, z = -.951, p = .342. The hypothesis was not supported.

Hypothesis 2

This study hypothesized that individuals who experienced CSA on two or more occasions would demonstrate greater severity of ON symptomology. A Mann-Whitney test indicated that EHQ scores were not significantly different for individuals with a history of CSA occurring 2 or more times (M_{rank}= 65.38) and those with a history of CSA occurring on one occasion (M_{rank} = 63.91), U = 1548.00 z = -.194, p = .846. The hypothesis was not supported.

Hypothesis 3

Based on the literature, it was hypothesized that history of an eating disorder would be a predictor of severity of ON symptomology. A Mann-Whitney test indicated that EHQ scores for those with a history of an eating disorder diagnosis (M_{rank} = 364.66) were significantly higher than those with no history of

an eating disorder diagnosis (M_{rank}= 254.87), U = 8886.00, z = -5.335, p < .001. The hypothesis was supported.

Hypothesis 4

It was hypothesized that history of eating disorder related treatment would be a predictor of severity of ON symptomology. A Mann-Whitney test indicated that EHQ scores for those with a history of eating disorder related treatment (M_{rank} = 131.22) were significantly higher than those with no history of eating disorder related treatment (M_{rank} = 97.03), U = 2175.50, z = -3.227, p = .001. The hypothesis was supported.

Hypothesis 5

It was hypothesized that there would be significant increases in healthy eating behaviors during COVID-19. A one-way ANOVA was conducted, and the assumption of homogeneity of variances was met (Levene's statistic = .452, p =.771). ANOVA results showed that there was no overall significant mean difference among the five group means of employment effects of COVID-19, F (4,530)= .909, p = .459, with an eta-squared of .005, suggesting that .5% of the variance on EHQ scores is explained by their employment impacts of COVID-19. The hypothesis was not supported.

Research Question 1

In this study, we aimed to determine whether sex differences exist in severity of ON symptomology. A Mann-Whitney test indicated that EHQ scores

were not significantly different for males (M_{rank} = 264.97) and females (M_{rank}= 268.19), U = 7951.00 z = -.114, p = .909. Recent literature indicating no significant sex differences in eating disorder behavior was supported.

Research Question 2

In this study, we aimed to determine whether racial differences exist in severity of ON symptomology. A one-way ANOVA was conducted, and the assumption of homogeneity of variances was not met (Levene's statistic = 2.383, p =.037). As such, the Welch's F test was used. ANOVA results showed that there is an overall significant mean difference among the six group means of racial groups, *Welch's F* (5,9.46)= 3.99, p = .032, with an eta-squared of .015, suggesting that 1.5% of the variance on EHQ scores is explained by their racial group.

Post hoc comparisons, using the Games-Howell post hoc procedure, were conducted to determine which pairs of the six racial groups means differed significantly. These results indicate that Caucasian/White individuals (M = 38.25, SD = 9.61) had a significantly higher average score on the measure of ON than Asian/Asian American individuals (M = 33.00, SD = 4.04). Recent literature indicating no significant racial differences in eating disorder behavior was not supported. However, these differences were only found among two of the eight racial groups.

Research Question 3

In this study, we aimed to determine whether age group differences exist in

severity of ON symptomology. A one-way ANOVA was conducted, and the

assumption of homogeneity of variances was met (Levene's statistic = .327, p

=.897). ANOVA results showed no overall significant mean difference among the

eight group means of age groups, $F(7,527)= .346$, $p = .932$, with an eta-squared of

.007, suggesting that .7% of the variance on EHQ squares is explained by age.

Recent literature indicating no significant age differences in eating disorder

behavior was supported.

Chapter 9

Discussion

The purpose of this study was to illuminate the impact of CSA on adulthood eating disorders, with special consideration of pathological healthy eating behaviors. As such, the present study aimed to extend the ON and CSA literature by investigating the relationships between ON and CSA, eating disorder history, COVID-19, sex, age, and race. Moreover, this study served to add to the limited body of research on ON. This is the first study to examine CSA as a risk factor for ON. The following includes a review and discussion of the results, limitations of the present study, and direction for continued exploration within the area of research.

Regarding CSA and ON, no statistically significant results were found. Individuals with a history of CSA did not demonstrate greater severity of ON symptomology. Moreover, those who experienced CSA on two or more occasions did not demonstrate greater severity of ON symptomology as compared to individuals who experienced CSA on one occasion. These findings are not commensurate with a majority of research indicating that stressful events, including CSA, are among the leading causes of eating disorders (Dancyger et al., 2017; Jacobi et al., 2004; Seubert & Virdi, 2018). While the hypotheses of CSA as a risk factor for ON were not supported, to date, this is the only study examining how CSA impacts ON in an effort to understand the origins of this disorder. Thus, future

studies examining how childhood experiences contribute to the development of ON are needed. Moreover, future studies should include measures to assess for posttraumatic reactions to determine whether a trauma response demonstrates a relationship with ON.

Another major objective of this study was to determine whether eating disorder history predicted greater severity of ON symptomology. We predicted that individuals who were previously diagnosed with an eating disorder would demonstrate higher scores on the EHQ. Moreover, we predicted individuals who previously received eating disorder related treatment would demonstrate higher scores on the EHQ. Statistically significant results were found, indicating that higher EHQ scores are related to eating disorder history. These findings are commensurate with previous studies suggesting that ON is highly prevalent in individuals post-treatment for AN and BN (Segura-Garcia et al., 2015). This finding represents an important step in establishing the validity of ON as a potential eating disorder diagnosis.

The lack of formal criteria for the diagnosis of ON has led to a debate regarding whether it is a standalone diagnosis or part of another condition, including other eating disorders (Brytek-Matera, 2012). The identified high comorbidity between ON and other eating disorders within this study suggests that ON may be motivated by a desire to lose weight (McComb & Mills, 2019). As such, ON may be seen as the "more acceptable" eating style to manage both

acceptance by familial support, as well as internal struggles on the individual in the maintenance stage of care. However, we must also consider the potential for ON to develop into other eating disorders or for ON to be a part of these disorders; ON may also serve as a precursor or warning sign of even more pathological eating behaviors. Future research is needed to assess this relationship.

In this study, we also explored the relationships of ON and sex, race, and age, adding to a slightly inconsistent literature, where ON symptoms have previously been found to be positively, negatively, and unrelated to each of these constructs. We found no significant differences in EHQ scores between men and women. This is consistent with most studies of high quality suggesting no relationship between gender and ON (Depa et al., 2017; Oberle et al., 2017). This finding is important as historically eating disorders have been considered diagnoses that primarily impact women. Thus, our findings highlight the importance of assessing and providing resources to men who appear to be at equal risk for developing ON. Moreover, the lack of overall sex differences in severity of ON scores support ON as distinct from AN and BN, which demonstrate a female to male ration of 10:1 (APA, 2013). It should be noted that only 6% of our sample identified as male; thus, these results should be interpreted with caution.

In this study, when examining ON and race, we found a significant difference in EHQ scores, with Caucasian/White individuals scoring higher than Asian/Asian American participants. These findings suggest that Asian/Asian

American individuals are at a decreased risk for ON when compared to Caucasian/White individuals. However, cultural differences in responding to survey items associated with ON may have influenced Asian individuals' scores, consequently inaccurately representing their symptomology. Interestingly, no other racial differences in EHQ scores were observed. Historically, eating disorders were recognized as disorders that mainly affected Western women. However, our findings are commensurate with recent research suggesting prevalence rates of eating disorders are rising in both Western and non-Western countries and occur among most ethnic individuals at similar rates (NEDA, n.d.a).

While our findings suggested Asian/Asian American individuals may be at a decreased risk for ON, our findings also highlight the importance of recognizing the occurrence of eating disorders among all racial groups. In doing so, we will be able to provide better access to care, accurate diagnosing, and resources to individuals within racial groups that have been historically misdiagnosed and underrecognized regarding their pathology.

We also found no significant differences in EHQ scores across the lifespan. These findings are consistent with studies suggesting no significant correlations between ON and age (Depa et al., 2017). Alternatively, previously mixed findings indicated ON to be more common among younger adults (Segura-Garcia et al., 2012), and others suggested the risk of ON to increase with age (Varga et al., 2014). Our findings highlight the need to assess for ON at each age group

throughout the lifespan. Together, our findings reject the historical view of eating

disorders as the "white woman" syndromes and elucidate the importance of

providing appropriate

care to individuals of all sexes, ages, and races.

This study also aimed to examine the impact of COVID-19 on healthy

eating behaviors. Stressful events have been proposed as prominent causes of

disordered eating. Thus, it was hypothesized that there would be significant

increases in healthy eating behaviors during COVID-19. We found no significant

differences in changes in healthy eating behaviors related to the employment

effects of COVID-19. It should be noted, approximately 75% of the sample denied

financial impacts of COVID-19 negatively impacting their ability to purchase their

preferred foods. It may be that individuals remained able to engage in similar

patterns of healthy eating behaviors during the COVID-19 pandemic, such that

those engaging in pathological eating behaviors continued to engage in such

patterns despite the stressors of COVID-19.

There are important limitations to consider within this study. First, we

gathered data from a non-clinical, convenience sample, with most participants

being women. Thus, our sample may not account for existing variations among

groups. Second, all of our measures were self-reported. Although data were

anonymous, some participants may have responded inaccurately to survey

questions. Moreover, our sample was recruited via social media, listservs, and

email distributions, which might limit its generalizability to older, less educated populations, and populations that lack computer literacy or internet access.

Additionally, the measurement of ON was based on the EHQ, a relatively new screener. While studies utilizing the EHQ reported adequate internal consistency and evidence for convergent and divergent validity (Oberle et al., 2017; Zickgraf, 2019), there are limited studies examining the validity and reliability of the EHQ; thus, more research with further reliability and validity data is needed. Moreover, ON is a recently proposed diagnosis with limited operationalized diagnostic criteria serving to limit our ability to accurately measure and define this construct. Despite these limitations, the results of this study suggest that ON is highly prevalent among individuals with a history of eating disorders, and equally prevalent among males and females, across the lifespan, and most racial groups.

Future research should focus on determining the directional relationship between ON and other eating disorders. It will be important to determine whether ON occurs prior to, in conjunction with, or subsequent to other eating disorders. Such research could further shed light on the nature of the relationship highlighted in this study between ON and eating disorder history and whether there is an underlying commonality or vulnerability that elucidates the relationship (Barrada & Roncero, 2018). Moreover, further studies should analyze the psychometric properties of the EHQ in other specific samples. Determining its validity and establishing a cutoff score will allow for more accurate assessment of ON, which

can be utilized to further clarify ON's relationship with CSA. Lastly, future research should aim to further elucidate and define formal diagnostic criteria for ON. Developing a stable definition of ON will allow for future research to develop more psychometrically sound measures of ON that encompass key concepts and diagnostic criteria, further clarifying its accurate prevalence and psychosocial risk factors associated with ON.

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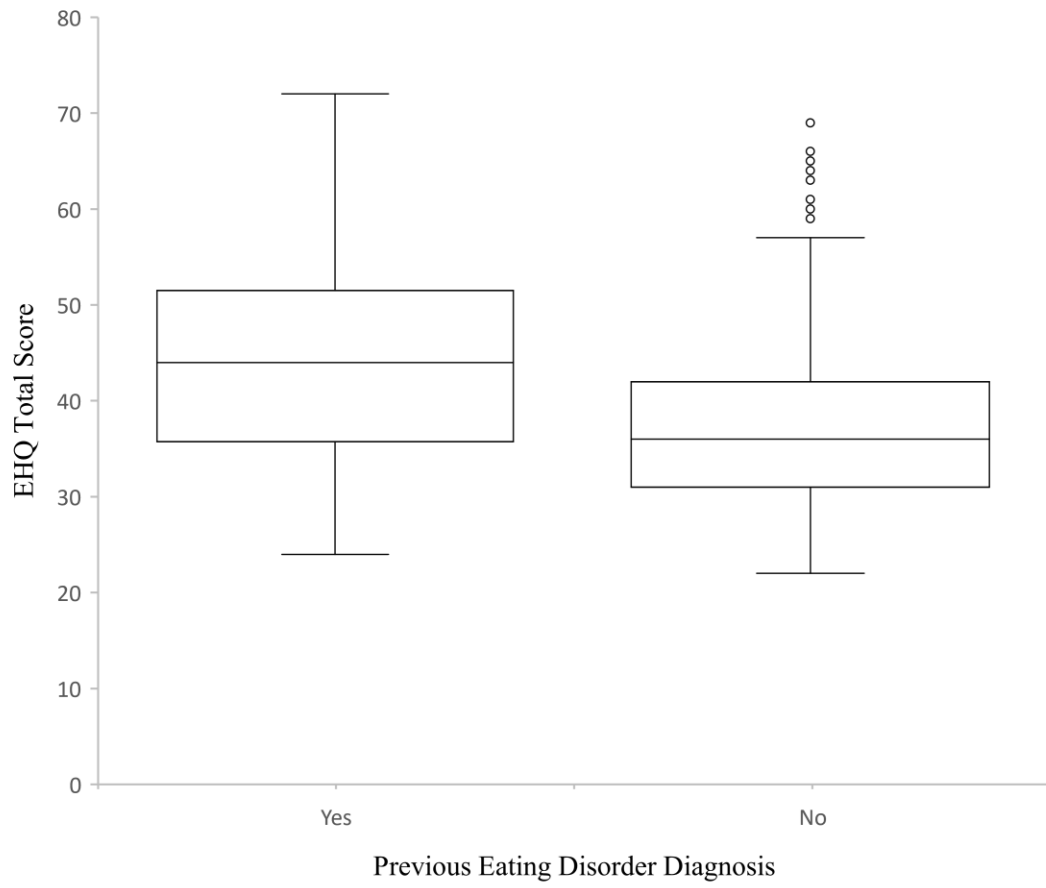
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Figure 1. EHQ Scores and previous eating disorder diagnosis

Table 1

Proposed Orthorexia Nervosa Diagnostic Criteria by Setnick (2013)

Diagnostic criteria

Criterion A. Pathological preoccupation with nutrition and diet far beyond that which is necessary for health, and undue influence of diet on self-evaluation, evidenced by characteristics such as:

- Phobic avoidance of or response to foods perceived to be unhealthy, such as refusal to be in proximity to such food or experiencing panic while watching others eat the food.
- Severe emotional distress or self-harm after eating a food considered unhealthy.
- Persistent failure to meet appropriate nutritional needs leading to nutritional deficit and/or psychological dependence on individual nutrient supplements in place of food intake due to the belief that synthetic nutrients are superior to those found in food or that food is contaminated (except in cases where food is known to be contaminated).
- Following a restrictive diet prescribed for a medical condition that the individual does not have, or to prevent illness not known to be influenced by diet.
- Insisting on the health benefits of the diet in the face of evidence to the contrary.
- Marked interference with social functioning or activities of daily living, such as isolation when eating, avoidance of social functions where food is served, or neglect of work, school or family responsibilities due to food-related activities.

Criterion B. Not the result of a lack of available food or a culturally sanctioned practice.

Criterion C. The individual endorses a drive for health or life extension rather than a drive for thinness.

Criterion D. The eating disturbance is not attributable to a medical condition or another mental disorder such as anorexia nervosa, bulimia nervosa or obsessive–compulsive disorder.

Note. Adapted from "The eating disorders clinical pocket guide, second edition: quick reference for healthcare providers" by J. Setnick, 2013, *Understanding Nutrition.*

Table 2

Proposed Orthorexia Nervosa Diagnostic Criteria by Moroze et al. (2015)

Diagnostic criteria

Criterion A. Obsessional preoccupation with eating "healthy foods," focusing on concerns regarding the quality and composition of meals.
(Two or more of the following.)

- Consuming a nutritionally unbalanced diet owing to preoccupying beliefs about food "purity."
- Preoccupation and worries about eating impure or unhealthy foods and of the effect of food quality and composition on physical or emotional health or both.
- Rigid avoidance of foods believed by the patient to be "unhealthy," which may include foods containing any fat, preservatives, food additives, animal products, or other ingredients considered by the subject to be unhealthy.
- For individuals who are not food professionals, excessive amounts of time (e.g.,3 or more hours per day) spent reading about, acquiring, and preparing specific types of foods based on their perceived quality and composition.
- Guilty feelings and worries after transgressions in which "unhealthy" or "impure" foods are consumed.
- Intolerance to other's food beliefs.
- Spending excessive amounts of money relative to one's income on foods because of their perceived quality and composition.

Criterion B. The obsessional preoccupation becomes impairing by either of the following:

- Impairment of physical health owing to nutritional imbalances, e.g., developing malnutrition because of an unbalanced diet.
- Severe distress or impairment of social, academic, or vocational functioning owing to obsessional thoughts and behaviors focusing on patient's beliefs about "healthy" eating.

Criterion C. The disturbance is not merely an exacerbation of the symptoms of another disorder such as obsessive-compulsive disorder or of schizophrenia or another psychotic disorder.

Criterion D. The behavior is not better accounted for by the exclusive observation of organized orthodox religious food observance or when concerns with specialized food requirements are in relation to professionally diagnosed food allergies or medical conditions requiring a specific diet.

Note. Adapted from "Microthinking about micronutrients: A case of transition from obsessions about healthy eating to near-fatal "orthorexia nervosa" and proposed diagnostic criteria" by R. M., Moroze, T. M., Dunn, J. C., Holland, J. Yager, and P., Weintraub, 2015, *Psychosomatics, 56*(4), 397-403.

Table 3

Proposed Orthorexia Nervosa Diagnostic Criteria by Barthels et al. (2015)

Diagnostic criteria

Criterion A. Enduring and intensive preoccupation with healthy nutrition, healthy foods and healthy eating.

Criterion B. Pronounced anxieties for as well as extensive avoidance of foods considered unhealthy according to subjective beliefs.

Criterion C.
- At least two overvalued ideas concerning the effectiveness and potential health benefits of foods. AND/OR
- Ritualized preoccupation with buying, preparing and consuming foods, which is not due to culinary reasons but stems from overvalued ideas. Deviation or impossibility to adhere to nutrition rules causes intensive fears, which can be avoided by a rigid adherence to the rules.

Criterion D.
- The fixation on healthy eating causes suffering or impairments of clinical relevance in social, occupational or other important areas of life and/or negatively affects children (e.g. feeding children in an age-inappropriate way). AND/ OR
- Deficiency syndrome due to disordered eating behavior. Insight into the illness is not necessary, in some cases the lack of insight might be an indicator for the severity of the disorder.

Criterion E. Intended weight loss and underweight may be present, but worries about weight and shape should not dominate the syndrome.

For diagnosing orthorexia, criteria A, B, C, and E must be clearly fulfilled. Criterion D should be fulfilled at least partially. If criterion E is not clearly fulfilled, diagnosing atypical anorexia nervosa is recommended.

Note. Adapted from "Orthorexic eating behavior: A new type of disordered eating" by F., Barthels, F., Meyer, and R., Pietrowsky, 2015, *Ernahrungs Umschau, 62*(10), 156–161.

Table 4

Proposed Orthorexia Nervosa Diagnostic Criteria by Dunn and Bratman (2016)

Diagnostic criteria

Criterion A. Obsessive focus on "healthy" eating, as defined by a dietary theory or set of beliefs whose specific details may vary; marked by exaggerated emotional distress in relationship to food choices perceived as unhealthy; weight loss may ensue as a result of dietary choices, but this is not the primary goal. As evidenced by the following:

- Compulsive behavior and/or mental preoccupation regarding affirmative and restrictive dietary practices believed by the individual to promote optimum health.
- Violation of self-imposed dietary rules causing exaggerated fear of disease, sense of personal impurity and/or negative physical sensations, accompanied by anxiety and shame.
- Dietary restrictions escalate over time, up till removing entire food groups, and involve progressively more frequent and/or severe "cleanses" (partial fasts) regarded as purifying or detoxifying. This escalation commonly leads to weight loss, but the desire to lose weight is absent, hidden or subordinated to ideation about healthy eating.

Criterion B: the compulsive behavior and mental preoccupation becomes clinically impairing by any of the following:

- Malnutrition, severe weight loss or other medical complications from restricted diet.
- Intrapersonal distress or impairment of social, academic or vocational functioning secondary to beliefs or behaviors about healthy diet.
- Positive body image, self-worth, identity and/or satisfaction excessively dependent on compliance with self-defined "healthy" eating behavior.

Note. Adapted from "On orthorexia nervosa: A review of the literature and proposed diagnostic criteria" by T. M., Dunn, and S., Bratman, 2016, *Eating Behaviors*, *21*, 11–17.

Table 5

Participant Demographics

Variable	Frequency	Percent
Age Group		
18 – 24	212	39.6
25 – 34	204	38.1
35 – 44	60	11.2
45 – 54	38	7.1
55 – 64	14	2.6
65 – 74	5	0.9
75 – 84	1	0.2
85 or older	1	0.2
Race		
Caucasian/White	468	87.5
Biracial/Multiracial	22	4.1
Asian/Asian American	15	2.8
Black/African American	14	2.6
Other	14	2.6
American Indian/Alaska Native	2	0.4
Ethnicity		
Not Hispanic/Latino	461	86.2
Hispanic/Latino	74	13.8
Sex		
Female	503	94.0
Male	32	6.0
Gender		
Female	499	93.3
Male	34	6.4
Other	2	0.4
Education		
Bachelor's degree	240	44.9
Master's degree	139	26.0
High school or equivalent	88	16.4
Doctorate degree	41	7.7
Other	25	4.7
Less than a high school diploma	2	0.4
Household Income		
$10k - $50k	167	31.2
$50k - $100k	156	29.2
$100k - $150k	98	18.3
Over $150k	79	14.8

Below $10k	35	6.5
Marital Status		
Single (never married)	319	59.6
Married	153	28.6
In a domestic partnership	37	6.9
Divorced	16	3.0
Widowed	7	1.3
Remarried	3	0.6