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BIOLOGICAL AND SOCIAL LINKS BETWEEN EATING BEHAVIOR AND STRESS AMONG COLLEGE STUDENTS

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BETWEEN EATING BEHAVIOR AND STRESS

AMONG COLLEGE STUDENTS

by

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ABSTRACT

Biological and Social Links
Between Eating Behavior and Stress
Among College Students

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Stress and eating behaviors are known to be correlated in all ages but is primarily associated with young adults. This correlation can be attributed to both biological and social links. In this review, I detail the effects of stress on the brain in a biological manner and the areas of the brain associated with eating behavior. I will also discuss social factors that could contribute to the correlation between stress and eating behavior in college students. Stress is a major factor in optimal digestion and health. A majority of students report experiencing times of stress or feeling overwhelmed throughout their college education. This stress can often cause students to find gratification through overindulging in food and the consumption of food with poor nutritional value. The stress students experience can be through academics, employment, financials, and organization responsibilities. Furthermore, this stress can vary through individual perception and gender. Some students use the consumption of food as a coping mechanism to deal with the stress they experience. Others may become stressed about their food consumption leading to a bidirectional effect between stress and eating. The stress students experience can negatively impact their academic success as well as their mental and physical health. College health promotion programs are vital in educating students on how to manage stress and eating behaviors to promote healthy behavior and wellbeing.
KEYWORDS: Stress, Eating Behavior, College Students, Health Promotion

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Introduction

College students, in particular, face an excessive amount of stress related to their academics as well as other aspects of their lives. In a national research survey of college students, the American College Health Association found that the majority of students are burdened by symptoms of stress (e.g., feeling overwhelmed, exhausted), and stress was recognized as a large impediment to academic success and overall wellbeing (ACHA, 2018).

Those suffering from high stress are more susceptible to acquiring poor eating habits which could result in the development of eating disorders. Eating disorders are a prominent problem in all ages of the population, although such behavioral struggles are primarily thought to affect college students. According to French and Jeffery (1994), "0.9% of women and 0.3% of men had anorexia during their life, 1.5% of women and 0.5% of men had bulimia during their life, and 3.5% of women and 2.0% of men had binge eating disorder during their life" (p.12). The consequences of poor eating habits and prolonged stress are detrimental to the lives of college students. In particular, the burden of a college student's responsibilities and lifestyle may further the negative eating behaviors and stress management. The correlation between disordered eating habits and stress is evident through many biological and social links approached from a general psychology and sociology framework, such as stress response, college environment, and coping mechanism.

In this essay, I will: clarify how the college environment affects the relation between stress and eating; describe the effects of stress on the brain, specifically addressing the areas of the brain associated with eating behaviors and digestion; explain

the use of food as a coping mechanism; and specify the effect of individual differences on the link between stress and eating behavior.

College Environment Links

Academics

College is a stressful time for young adults, which makes them particularly vulnerable to the negative cycle between stress and eating. This stress can come from a variety of things, but primarily stems from academics (Roos & Schreck, 2019). Academic stress is something that a majority of college students face. While some stress derives from pressure of family or professors, it may also stem from the student's personal desire for success and individual standards. The pressure to succeed academically often causes students to become overwhelmed in their pursuit of a degree. College students' academic stress refers to aspects such as course work, group assignments, and exams, as well as perceptions and behaviors toward the pressures of their particular degree (Wilks, 2008). While this stress is present in the majority of students, there are some discrepancies in relation to gender. Researchers have found that female students report higher levels of academic and widespread stress compared to male (Backovic et al., 2012). Research has indicated that achievement motivation is not significantly correlated with academic stress, but gender and locus of control are (Karaman et al., 2019). This suggests that academic stress is largely dependent on gender and perception rather that the motivation to succeed and the pressure that is related to that idea.

In a study by Karaman et al. (2019), it was indicated that higher levels of academic stress were linked to higher levels of external locus of control and lower life

satisfaction. Gender was found to be an important factor in that female college students reported greater levels of physiological stress compared to males. This was consistent with previous research by the American College Health Association demonstrating that women, compared to men, frequently reported higher frequency of dealing with stressors (2018). A potential explanation for this gender variance is that pressures felt by women may prompt physiological responses, such as headaches, shivering, and perspiration, to stressors. This study found a negative correlation between life satisfaction and academic stress. This indicates that as life satisfaction diminished, academic stress grew (Karaman et al., 2019). This shows the importance of positive coping mechanisms for stress and a healthy lifestyle to promote higher life satisfaction and in result, decreased academic stress.

Social Life

College represents a significant developmental milestone, affording students a greater level of independence and separation from family compared to earlier years, but it also accompanies a great level of expectations and responsibilities (Coccia & Darling, 2016). Along with academics, students often place a great deal of importance on forming connections and making friends. Social life may be an important factor in college students stress levels and eating behaviors. Many students struggle to balance their social life with academics which, in return, can cause a great deal of stress. College is a coming of age moment for many individuals that can cause tension between the desire to meet new people, experience college activities, and to succeed in academics (Coccia & Darling, 2016). First year students may have an unrealistic expectation for what their social experience in college will entail. This can bring a great deal of stress when their

experiences do not meet their expectations. The drive to ensure college social experiences meet an individual's expectations may cause supplementary stress in a student's life as they devote their time to meet this expectancy (Coccia & Darling, 2016). Additionally, many students may use food as a method of socializing and connecting with their peers. The utilization of bars and restaurants as a means of socializing is a common occurrence for young adults. This can increase negative eating behaviors when the choice of restaurant or food is not nutritional, or the food intake is beyond the caloric needs of the individual.

Having an active social life can not only present negative effects on college students, but can also have a positive effect on individuals. Students that have a good social support system may experience less stress and have a greater ability to deal with the stress that does occur. The common sources of social support include family and friends; however, peer support and a connection to the community play an important factor in the buffering of stress (Sawatzky, 1998). Research has shown that, in general, college students feeling stronger connections to their campus and community have an increased probability of success (Stebleton et al., 2014). This connection to peers and college community may promote health stress management behaviors as well as academic success. This demonstrates that the social life and social support of college students can present both positive and negative effects on stress management and eating behaviors depending on the individual.

Work and Volunteering

Coinciding with academics and social life, many students hold part-time jobs and participate in extracurricular activities in their free time in order to support themselves

throughout their education. According to the most recent U.S. census, 72% of undergraduate students are employed, with 20% of undergraduates possessing full-time jobs (U.S. Census Bureau, 2012). For this group of students, they not only attend class full time and complete assignments, they must also manage working weeknights or weekends. Working while attending school has been shown to be correlated to enhanced feelings of stress and exhaustion (Lederer et al., 2015). The pressure of other responsibilities can contribute to fatigue and stress for many individuals. These feelings of stress and lack of time may result in students making poor choice about the food they are consuming. Furthermore, students may choose unhealthy meals out of convenience between busy class and work schedules.

Along with work, many students also immerse themselves in organizations or Greek life on campus. These organizations have member requirements and a minimum level of participation. This adds to the already busy schedules of college students and may contribute to stress in the attempt of time management. The need to manage academics, group participation, work schedules, and mental health is an overwhelming task itself. The act of juggling different roles and tasks may lead to high levels of stress and poor eating habits as a method of gratification or as a result of busy schedules. With the burden of an individual's other responsibilities, healthy meal options are a low priority. They may grab something between meetings, shifts, or class without thinking about the nutritional benefits of the food they are consuming. As a result, poor eating habits may persist. The levels of stress under these conditions differ by individual; however, convenience may be a factor in the food choices made in these circumstances.

Availability of Food

Young adulthood is a stage in life often categorized by weight gain, especially in recent years where environments have become flooded with inexpensive, desirable, highly processed foods and convenience has become a defining factor in food choices. In a study by Hebden et al., taste was found to be the most important factor concerning food selection, followed by availability, cost, nutritional content, smell, and stimulatory properties (Hebden et al., 2015). The availability of food is a factor of stress and eating behaviors that differs from on campus students and off campus students. For younger students that live on campus, availability of food is not necessarily an issue. It is the quality and nutritional value of food that plays a larger role in eating behaviors and health of college students. At the University of South Dakota, the main options for dining consist of Chick-fil-a, Qdoba, Einstein Bros. Bagels, and the dining hall. While healthy options are available at each of these establishments, a majority of the menu consists of foods high in sodium, fat, and carbohydrates. Students under stressful conditions are more likely to choose foods that will give gratification rather than nutritional benefits. These food options fuel the poor eating habits of college students and result in the infamous “freshman 15.” As healthy options are available, the choice lies with the student to make educated, nutritional choices to benefit their wellbeing and health. Furthermore, nutritional value is not easily accessible from the menus of these establishments. Many restaurants display calorie content, but fail to demonstrate the amount carbohydrates, sodium, sugars, among other nutritional components, clearly on their menu. This information is available upon research, but students may be unaware of this or not willing to put in the efforts to learn about the foods they are consuming.

Additionally, the quantity of food options available on campus may lead students to overeat during mealtimes.

Off campus students have more flexibility to make mindful choices about their food consumption but are also subject to similar options. Many off campus students prepare meals at home from food bought at local grocery stores, but others choose to rely primarily on take-out meals or meals from on campus options due to convenience. Approximately 40% of young adults' eating incidents occur in places other than the home (Hebden et al., 2015). Students often spend long days on campus in class or studying, which may result in an increased likelihood to purchase the food available on campus rather than returning home to prepare a nutritious meal.

Students that prepare meals at home rely on other factors for their meal choices. Grocery stores are filled with nutritional food and items for purchase, but the cost of food becomes a deciding factor for many students. Healthier food items tend to be more expensive than other food items available. While the financial standing of many students is limited, individuals may be prone to choose inexpensive, less nutritious options from the grocery store. The availability of food and the cost are primary factors in students decisions regarding meals. Convenience is also a determining factor for student on campus as well as off campus. These factors may be attributed to the negative eating behaviors and lack of mindful eating of college students.

College Health Promotion

Nutrition

In recent years, colleges have placed a greater importance on providing educational resources to students about stress management techniques and healthy eating. These resources and programs are vital to educating young adults on the importance of mental health and nutrition. In particular, the following of dietary guidelines for students is very important, in order to protect against foodborne illnesses, sustaining a desirable weight and body composition, as well as developing skills to identify and prevent eating disorders. Nutrition education provides knowledge and brings awareness about healthy eating behaviors suitable for college students (Lederer & Oswalt, 2017). Students that are not aware of what constitutes a healthy meal or wholesome snack may fail to provide their body with the necessary nutrition. Health education helps students develop the skills and knowledge about nutrition to modify their eating habits and avoid leading causes of death, illness, and injury (US Department of Health and Human Services, 2010). These health education programs offer college students extensive information to promote healthy attitudes, knowledge, and behaviors, such as healthy eating among students. Many colleges provide educational programs to promote mindful choices about the nutrition and portion control. Additionally, school systems provide meals based upon dietary guidelines and nutritional requirements in their dining halls to provide a healthy, balanced meal options for students attending college. The information and meal options are promoted by universities as an attempt to prevent negative eating behavior and promote healthy lifestyles in their students (Kicklighter et al., 2010). The University of South Dakota, for example, provides nutritional information about the meals provided in

the dining hall through a website. This website also denotes what options would constitute a healthy choice as an aid for students. It is up to the student to be willing to participate in these programs and obtain the knowledge provided.

Availability of Counselling Services

Universities place a strong importance on health promotion and stress management due to the increased incidence of stress college students often experience. Paralleling with stress management, increased awareness of the importance of life-style habits and behaviors has become relevant (Romano, 1984). Many students have not experienced the type or level of stress common in college. With this comes an inability to properly manage and resolve these stressors. Universities have begun to develop psychological interventions to aid and alter maladaptive behaviors. Because changing of unhealthy life-style behaviors is not an easy feat, counseling services are also available on many college campuses. These services can greatly improve the mental health of students and teach them to properly manage their stress and lifestyle. While many students do not reach out for help and counselling services, these programs continue to provide students with information to aid them in their struggles. Universities promote the total wellbeing of students and actively reach out to students that may be falling behind or in need of mental health services.

Biomechanics of Stress and Eating

The Effect of Stress on the Brain

Modifications in the hypothalamus adrenal axis (HPA) can impact many biological systems involved in eating behavior, such as the thyroid, reproductive,

immune, and sympathetic nervous system (Castellini et al., 2014). The HPA axis has shown hyperactivity throughout periods of disordered eating, especially in the acute phases of eating disorders (Castellini et al., 2014). The hypothalamus is the main target of the stress response in humans. This suggests that during abnormal eating behaviors, the stress response of the body is atypical and may not provide the necessary functions. Cortisol, the major stress hormone in humans, targets the entire body, but specifically exhibits an effect on the brain. The key target of the cortisol pathways is the paraventricular nucleus (PVN) of the hypothalamus, located adjacent to the third ventricle in the brain (Dedovic et al., 2017). Upon the perception of stress, the paraventricular nucleus releases corticotropin releasing hormones (CRH) that then travel through the infundibulum to the pituitary gland. Here it stimulates secretion of adrenocorticotropic hormone into the bloodstream. When the adrenocorticotropic hormone reaches the adrenal cortex, it binds to receptors that stimulate the secretion of cortisol into the bloodstream (Dedovic et al., 2017). The release of cortisol is a negative feedback loop where it regulates its own release in the central nervous system.

Cortisol has a broad variety of effects in the human body due to many cells containing receptors for this particular hormone. A decreased activity in orbitofrontal prefrontal cortex (PFC) has been correlated with greater levels of cortisol secretion in response to psychological stress. Similarity, increased activity in medial PFC is coupled with reduced cortisol secretion. These areas of the brain play a precise role in gathering and integrating sensory information from the body and the environment. Stress susceptibility can be influenced by many aspects, including genetic inclination, personality traits, previous coping responses, and past life experiences in general, as well

as in early ages. The release of cortisol can have an effect on both peripheral systems as well as central processes (Dedovic et al., 2017). Cortisol levels return to homeostasis after acute stress has been resolved. If cortisol levels are not normalized it can have a negative effect on the body. A dysregulated stress response may further disrupt eating behaviors, as well as optimal digestion, leading to negative mental and physical health of the individual. Individuals that are unable to regulate stress response and cortisol levels may develop gastrointestinal problems and functional complications in many body systems and may exhibit difficulties regarding memory and decision making. This dysregulated stress response occurs in the Autonomic Nervous system.

Stress Relation to Digestion

The Autonomic Nervous system (ANS) is the portion of the nervous system that controls stress responses and digestive behavior. The ANS, is divided into two subsections: the sympathetic nervous system and the parasympathetic nervous system. The sympathetic nervous system (SNS) controls the "fight-or-flight" response, whereas the parasympathetic nervous system (PSNS) regulates the "rest-and-digest" response. The dysregulation within the ANS can contribute to an abnormal stress response and impaired digestive function. The ANS is responsible for maintaining homeostasis via chemical messengers. Research has shown that the PSNS supports digestion by increasing salivary secretions and stimulating gastric juices, digestive enzymes, and bile to expedite nutrient absorption (Cherpak, 2019). The SNS is activated in times of perceived or real threat, using the body's energy supply for functions involved in immediate need, compromising digestion. During SNS activation, the PSNS is rendered nonfunctional. Therefore, SNS deactivation and PSNS stimulation is needed to elicit optimal digestion. The PSNS can be

activated through mindfulness practices (Cherpak, 2019). Thus, mind-body practices may help promote ANS homeostasis (i.e., regulation of the SNS and PSNS), which appears essential for ideal digestive function and proper stress management.

The poor eating behavior that is often reflected in periods of stress can cause physiological problems. This is often present in gastrointestinal disorders such as irritable bowel syndrome and functional dyspepsia. Stress is the juncture at which conscious decision making can be directed at mindful eating. Mindful eating plays a role in optimizing digestive function (Cherpak, 2019). Under stressful situations, students may neglect mindful decision making in regard to the amount of food they are consuming as well as the nutritional value of this food as a coping mechanism. Much like any stress, this stress can result from real or perceived threats. The perception of these threats can be contextualized as positive or negative stressors. The source of this stress may also vary from physical, chemical, mental, emotional, or nutritional. During the stress response, corticotrophin releasing factors (CRF) are released in the Central Nervous System. CRF has a large effect on digestion by modulating inflammation, enhancing gut permeability, contributing to increased perception of pain, and regulating gut motility (Konturek et al., 2011). While acute stress is purposeful in instigating the “fight-or-flight” response and returning to homeostasis following this stress, chronic stress can pose a multitude of poor health outcomes on digestion, as well as the overall body. Metabolic reserve, which is the ability of organ systems and tissues to preserve integrity for physiological resistance during stress, guards against poor health outcomes that could result from the rapid changes that characterize the stress response. Chronic stress and poor eating behavior deplete metabolic reserve, impairs homeostasis, prevents positive behavioral changes,

and alters the gastrointestinal microbiome and permeability, which contributes to chronic disease and gastrointestinal complications (Cherpak, 2019). The impact of poor eating behavior can manifest in gastrointestinal complications and structural and functional changes of many other systems in the body.

The Impact of Eating Behavior on the Brain

Eating behaviors are controlled by the Nervous System and may also have an effect on the structure and function of most bodily organs, including the brain. Furthermore, alterations in brain structure may be correlated with the development of eating disorders. It has been seen that individuals with abnormal eating behaviors have reductions brain volume, including both white and gray matter, as well as variances in the parahippocampal gyrus, striatum, insular cortex, cingulate cortex, frontal areas, and somatosensory regions of the brain (Solstrand Dahlberg et al., 2017). The frontal cortex, specifically the dorsolateral prefrontal cortex (DLPFC), reveals, in response to food, increased activation in individuals diagnosed with Anorexia, which involves extreme restriction on daily caloric intake (Solstrand Dahlberg et al., 2017). This region of the brain is involved in working memory as well as restraint and obsessions. It is indicated that this area of the brain uses working memory to facilitate cognitive strategies related to restrictions of food intake in individuals suffering from eating disorders. "Structural reduction in these brain areas may be related to the onset of functional aberrations that correlate with the onset of disordered eating in adolescents," (Solstrand Dahlberg et al., 2017, p. 193). This suggests that eating behavior has a direct impact on brain performance and structural anatomy. This causation may also be viewed as a snowball

effect, indicating that structural changes in the brain may further negative eating behavior and the onset of eating disorders.

Eating behavior can be directly modulated by the mechanisms of reward. The mechanism of reward in regard to food is regulated by the dopaminergic system (Zilberter, 2015). Under conditions of stress, the mechanism is enhanced, which stimulates a cycle and ultimately leads to negative responses including overconsumption of food, and potentially obesity (Sominsky & Spencer, 2014). The development of obesity furthers health complications in young adults as a result of the negative eating behaviors. Many individuals use the consumption of food as a mechanism of gratification and a manner in which to cope with the stress they are experiencing. The collaboration between reward, gratification, and the dopaminergic system can overpower hunger control and eventually lead to poor eating behaviors (Zilberter, 2015). This need for gratification eventually leads to an inability to control hunger in response to stressful situations, thus leading to overindulgence and a reliance on food to ease frustrations. This can be problematic in students that are subjected to increased levels of stress leading to a stronger urge for gratification, and in result food consumption. Additionally, the type of food being consumed has an impact on stress management and physical health.

Food Type Effect on the Brain

The type of food consumed may also have an effect on stress management and brain function. Foods rich in carbohydrates and low in proteins may prevent a lowering of mood and poor performance on uncontrollable stressful tasks in individuals with a high stress-proneness. Stress results in a rise of activity in the serotonergic brain systems (Stanford, 1993). It has been suggested than an increased activity of central serotonin is

an important biological condition enabling the human brain to cope with stress. It has been found that individuals that are prone to stress have a higher risk of serotonin deficiency in the brain (Markus et al., 1998). A diet high in carbohydrates may cause a shortage of central serotonin during periods of acute stress due to carbohydrates' potentiating effect on brain tryptophan (Markus et al., 1998). The result of this condition is that coping with stress, mood, and accuracy of performance may deteriorate. This may have a negative impact on the mental and physical health of students as well as their academic success.

Excessive sugar, an alternative form of carbohydrate, consumption may also have an effect on the brain and stress management. Animal and human studies provide evidence that the consumption of foods high in sugar during periods of acute stress may inhibit cortisol reactivity and cause a dysregulated cortisol response. Research in rodent models suggested that consuming sugar may restrict activity in the brain that regulates stress-induced HPA, ANS, and emotional responses (Tryon et al., 2015). Research suggests that sugar acts to activate a metabolic-brain feedback pathway. The activation of this pathway suggests that the metabolically restorative effects of sugar may control sucrose-induced restriction of stress responsivity (Dallman et al., 2003). In return, this can lead to a dependency or habit to ingest large amounts of sugar during periods of stress. Furthermore, stress can promote the consumption of foods that provide gratification, rather than nutritional satisfaction, which typically contain high sugar and fat content (Tryon et al., 2015). An estimated 40% of individuals report eating larger quantities in response to stress, and 80% report that they eat foods with higher sugar content (Gibson, 2006). Consuming sugar as a coping mechanism to deal with stress can

create a destructive habit and manifest in frequent overeating, obesity, or related conditions (Tryon et al., 2013).

The study conducted by Tryon et al. (2015), found that consumption of beverages containing sugar inhibits stress-induced cortisol secretion in humans. This evidence suggests that the consumption of foods high in sugar during periods of acute stress may inhibit cortisol reactivity and cause an abnormal cortisol response. High intake of sugar could also create health problems for individuals and present additional complications in the future such as obesity, cardiovascular diseases, and type 2 diabetes. This ingestion of sugar in stressful conditions may also promote enriched daily sugar consumption which can also contribute to health problems. While the type of food ingested has an impact on stress responses and management, variance in perceived stress and eating behavior may also be credited to differences in gender.

Gender Differences in Stress Management

The variance of stress responses and coping mechanisms may be attributed to differences in gender. Stress is common through all ages, but college students in particular face a great deal of stress. In general, men and women report experiencing a similar amount of stress. The stress experience, however, may vary between men and women students. In a study performed by Chris Eisenbarth, women scored higher than men on the perceived stress scale, but both genders indicated that their lives feel uncontrollable and overwhelming at times (Eisenbarth, 2019). This study did not present a statistically significant difference between the stress experienced between women and men. The college environment may present similar general stress experiences, however, differences in stress exposure may still exist between men and women during their

college education. Furthermore, the perception of stress may differ between men and women. While this research did not demonstrate significant differences between genders and stress levels, past research had differing results. Previous research by the American College Health Association demonstrated that women, compared to men, frequently report higher frequency of dealing with stressors not related to school (2018). This suggests that the type of stress may be relevant to perceived stress and the overall stress experienced.

Social support may also demonstrate gender differences in relation to stress-induced eating behaviors throughout college. In a study by Darling et al., findings suggested that individuals entering college with a lower degree of social support may place males at a greater risk for weight gain as a result of stress eating (Darling et al., 2017). This study presents evidence of that the role of social support as a buffer for weight gain caused by stress is dependent on gender. (Darling et al., 2017). Social support may play a significant role in the relationship between stress and eating behavior for males but does not show the same effect for females. The cycle between stress and food consumption, in both genders, can often develop into a negative coping mechanism that can present further health complications, such as eating disorders. In the next section, I review eating disorders and alcohol consumption as a coping response to stress.

Coping Response and Behavior

Anorexia

The circular relationship between stress and eating, both physiological and psychological, may be a contributor to eating disorders. Obsessions with food, body

weight, and figure may constitute poor eating behaviors and also signal an eating disorder. According to the National Eating Disorders Association (NEDA), between 10-20% of women and 4-10% of men in college suffer from an eating disorder (Jacobson & Child Mind Institute, 2019). Some of the main eating disorders that affect individuals are anorexia nervosa and binge-eating disorder. While these eating disorders have similarities in effects and possible causes, the basis of these disorders vary greatly.

Anorexia nervosa is a potentially life-threatening eating disorder categorized by an abnormally low body weight, severe fear of gaining weight, and a distorted ideal of body image and shape (DSM-5, 2013). Individuals with anorexia use dangerous efforts to regulate their weight and body image, which can have a significant effect on their health. When an individual has anorexia, they frequently limit calories in an extreme nature or use other methods to lose weight, such as intense exercise, or the use of laxatives and diet aids (DSM-5, 2013). This can dramatically affect their health and wellbeing. Many individuals may respond to stress by mentally shutting down and avoiding necessary actions, such as eating, drinking, or sleeping. This can result in the body being placed in an Anorexic state leading to detrimental effects on the body. According to the National Eating Disorders Association (NEDA), full developed eating disorders usually begin between the ages of 18 and 21 (Jacobson & Child Mind Institute, 2019). College students frequently resort to anorexic tendencies when studying for long hours or when balancing the stress of maintaining a social life along with devoting ample time to their academics. The transition into college and the strong importance on academic success and balancing various obligations may cause students to shift focus from healthy eating habits to their other responsibilities. This puts college students at an increased risk for developing eating

disorders from the chaotic eating behavior they possess. Furthermore, the pressure to possess a body image that fits the social norms may lead young adults to develop anorexic tendencies or another eating disorder.

Binge-eating Disorder

Not every eating disorder can be categorized by the same behaviors or effects. Binge-eating disorder is very different than other eating disorders. “2.8% of American adults suffer from binge eating disorder in their lifetime” (Eating disorders, 2018, p.1). Binge-eating disorder is classified when an individual regularly eats an excessive amount of food and is unable to feel control over their eating behavior. Individuals with this disorder may eat quickly and more food than necessary for their body, even when hunger is not an issue. This binging can cause individuals to feel a sense of guilt, disgust, or shame by their behavior and eating habits. The difference in this eating disorder compared to others is that individuals may compensate for this behavior with extreme exercise or purging consistent with bulimia, restrict calories in a manner similar to Anorexia, or simply just feel ashamed by their actions (DSM-5, 2013). During this disorder, a new round of bingeing can occur with any frequency.

This disorder is hard to diagnose because it is easily hidden. Many do not show the extreme weight loss changes that those with anorexia or bulimia may, although some do. Binge-eating disorder varies greatly between case, making it harder to pinpoint the exact effect. One out of every 100 American college students appears to binge eat and purge in order to lose weight (Hewitt & Gray, 1993). Students responding to stress from academics or other obligations may be influenced by gratification to binge on excessively

fatty, carb-filled foods as a negative method of coping. This can constitute a Binge-eating disorder and lead to unfavorable effects on the body.

Alcohol Consumption

The recursive association between stress and eating behavior may lead to additional negative coping mechanisms, such as the consumption of alcohol. Stress has been continually associated with increased alcohol intake among adults and college students. With the stress of college life and academics, many students turn to alcohol as a relief or as a way of socializing. Up to 80% of students reported some variety of alcohol use and approximately half reported heavy, periodic drinking (Metzger et al., 2017). The association between stressors and drinking may be explained by the self-medication hypothesis. This theory suggest that individuals may use alcohol as a way to cope with negative emotions that they experience in response to stressful situations. Individuals who are more likely to use drinking to cope with stress, tend to be motivated by the desire to alleviate short-term stress by avoidance rather than addressing issues needed to relieve long-term stress. Students who generally use maladaptive coping strategies, such as alcohol or excessive eating to manage stress, may be at a greater risk of problematic behavioral and psychological effects (Metzger et al., 2017). Drinking alcohol as a method of coping with stress has the potential to cause a harmful cycle for students where the use of alcohol could possibly increase stress levels.

The over consumption of alcohol may also be correlated with excessive intake of food, specifically unhealthy substances. During a night out, college students often order take-out from restaurants or indulge in these foods the following day in attempts to cure a “hangover”. Foods rich in simple carbohydrates have a poor effect on the body and brain

performance (Markus et al., 1998). This cycle of alcohol abuse and indulgence in unhealthy foods has a poor impact on overall health of individuals. Additionally, the use of alcohol may have negative impacts of the academic performance of students, which could cause further stress and the continuing of the cycle.

Positive Coping Responses

Although some students may be subjected to dealing with stress in a negative manner, such as poor eating behaviors and alcohol consumption, some individuals manage the stress of college in a positive manner. Stressors that may affect college students can be broadly classified as academic, time, health, self-imposed, and economic. These stressors are the not the cause of the anxiety or unease themselves rather the stress stems from the individual's perception and reaction to these factors as well as the interaction between them (Zaleski et al., 1998). In a study conducted in Karachi medical college by Babar T. Sheikh. et al. (2004), more than 90% of the students within the study reported they had multiple bouts of stress while in college. 94.1% of males and 91.1% of females supported this status.

The most frequent coping mechanisms used by college students were religious coping, active coping, acceptance, planning, and positive reframing (Zaleski et al., 1998). Significant gender differences are also present in the use of positive coping mechanisms. Many students utilize music, sports, religious activities, and exercise as manners to alleviate stress. These activities allow students to relieve stressful situation and redistribute their energy and focus in a positive manner. Students often use the wellness center available on campuses and attend exercise groups in order to alleviate these stressors and increase overall wellbeing. Other students use music as an outlet and an

approach to refocus. Social support may have a large impact on the stress management of students. Religious groups and churches are frequently located on campus or nearby to help students adjust to college and relieve stressors that accompany this. Furthermore, counseling centers are actively promoted on college campuses to help students evaluate their stress and deal with it in a positive manner. The utilization of these activities, among many others, allows students to alleviate frequent stress in a means to benefit overall health as well as mental health. This may lead to higher levels of success and wellbeing in students.

Individual Differences in Perception

While there are many commonalities between eating behaviors and stress in college students due to the environment they are exposed to, individual differences are still present. Each individual possesses a different attitude toward stress and eating. To begin, individuals define healthy eating and food in a different manner. Some individuals may view healthy eating based on a low quantity of fat or carbohydrates, some may view healthy foods based on natural versus processed foods, and others may view healthy on the basis of nutrients and balance in their diet. This variance can lead to discrepancies in what constitutes healthy eating in college students and how this impacts their behaviors. It becomes difficult to pinpoint a definition of healthy eating based on these standards. Additionally, eating behaviors that may be normal to some individuals may constitute unhealthy behaviors in others. For example, individuals that grew up eating three meals a day may find that students choosing not to eat breakfast in the morning an unhealthy behavior. Perception is a significant factor is what constitutes healthy versus unhealthy

eating. This discrepancy in perception may cause errors in data pertaining to this correlation collected from surveys.

In regard to stress, there is variance in the type of stress perceived and experienced. Stress and eating behavior present a bidirectional relationship. Though many students use eating as a method of dealing with stress, others may become stressed about their eating and self-image. Body image is a sensitive topic in the lives of young adults. This perception of what constitutes proper body image may have an impact on the eating behaviors of students. Students may go to great lengths to alter their body in an attempt to meet the social norm of what is acceptable. This may cause students to resort to calorie or food intake restrictions which demonstrates behaviors in accordance with eating disorders. Additionally, exercise may be abused as a means to alter an individual's body. This results in a lack of calories for the body and ultimately poor nutrition. This variance in stressors and stress management may cause discrepancies in the correlation between stress and eating behaviors among college students and young adults in general.

Conclusion

Stress is inevitable in the lives of college students. The manner at which students manage stress and eating behavior is vital to their success and wellbeing. The stress response in the body is facilitated by hormones and the ANS. Cortisol is a significant hormone that is released when the body registers stress. Cortisol's broad variety of effects in the body is due to the majority of cells having receptors for this particular hormone. The effect of cortisol on the central nervous system in response to stress is reliant several factors, such as, different stress types, sex of the individual, and early life experiences. The parasympathetic nervous system (PSNS), a part of the Autonomic Nervous System

(ANS), regulates the “rest-and-digest” response. The ANS contributes to a dysregulated stress response and impaired digestive function. Therefore, PSNS stimulation is needed to elicit optimal digestion. Research has shown that PSNS supports digestion by increasing salivary secretions as well as stimulating gastric juices, digestive enzymes, and bile to expedite nutrient absorption. Mind-body practices may help promote ANS homeostasis essential for ideal digestive function. Additionally, there are many areas of the brain which are linked to the stress response as well as eating behavior. Eating behavior is specifically reliant on a reward system which is mediated by the dopaminergic system of the brain.

The correlation between eating behavior and stress is dependent on a variety of factors. For example, gender differences have been linked to variance in the perception of stress in relation to stress type. College environment, in particular, may contribute to a negative effect of stress as well as impact eating behavior. Students manage academics, social lives, work, organizations, and food availability. This may lead to a surplus of stress as well as negative eating behaviors out of convenience or as a method of gratification. The correlations between stress and eating habits are similarly dependent on individual differences. Many individuals perceive stress and respond to it in a variety of manners. This can cause variance in the effect of stress and the manner at which it can be managed or resolved. Additionally, body image may create stress or impact student’s eating behaviors.

The variety of factors that contribute to the correlation of stress and eating behavior in students may further the development of eating disorders such as Anorexia or Binge eating disorder in an attempt to cope. These disorders not only negatively affect

the health of the student but can also impact their success academically. Universities provide many programs to education students on what constitutes healthy eating and positive coping mechanisms. The use of these programs is crucial to the success and wellbeing of students. The biological and social links between eating behavior and stress among students can not only bring insight into the health of students and their success throughout college, but also promote wellbeing and mindful decision making.

Implications and Future Directions

The biological and social links between eating behavior and stress among students can not only bring insight into the health of students and their success throughout college, but also promote wellbeing and mindful decision making. Through this information, universities can implement additional programs to promote healthy stress management and eating behavior in their students to target the connection between these ideals. The correlation between eating behavior and stress can also bring further insight into the actions of students and allow a more personalized therapy plan by counsellors to provide the best treatment possible for students.

To fully understand the correlation between eating behavior and stress, it is essential to undergo future research to gather additional information on this link. Specifically, to look at possible interventions and the value of time in regard to this. The time of intervention may play a significant role in altering behavior and management techniques for students struggling to managing their eating behavior concerning stress and vice versa. Future research should compare varying lengths as well as variance in duration of intervention. Another aspect of research could be the effect of acute versus chronic stress in eating behavior in the short term as well as long term. Furthering the

research on this topic will provide universities and counselling centers the information to best help and treat students struggling with these negative behaviors.

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