

Illinois State University

ISU ReD: Research and eData

---

Theses and Dissertations

---

2022

## The Relationship between Eating Behaviors and Weight Cycling among College Students

Kayla Valluzzi

Illinois State University, kvalluzzi@yahoo.com

Follow this and additional works at: <https://ir.library.illinoisstate.edu/etd>

---

### Recommended Citation

Valluzzi, Kayla, "The Relationship between Eating Behaviors and Weight Cycling among College Students" (2022). *Theses and Dissertations*. 1580.

<https://ir.library.illinoisstate.edu/etd/1580>

This Thesis-Open Access is brought to you for free and open access by ISU ReD: Research and eData. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of ISU ReD: Research and eData. For more information, please contact [ISUREd@ilstu.edu](mailto:ISUREd@ilstu.edu).

# THE RELATIONSHIP BETWEEN EATING BEHAVIORS AND WEIGHT CYCLING AMONG COLLEGE STUDENTS

KAYLA VALLUZZI

41 Pages

## Purpose

The aim of this study was to investigate the factors that contribute to diet and weight control behaviors and the presence of weight cycling among college students.

## Study Design

Students at Illinois State University were invited to participate in a Qualtrics survey distributed via email. Inclusion criteria included being a current student at the university between the ages of 18 and 24. The study population (N= 351) included participants with an average age of 20.5 years old (SD= 1.7). Preferred gender included 267 (76.1%) females, 75 (21.4%) males and 9 (2.6%) non-binary identities.

## Results

The majority of participants were in the “normal weight” category with an average BMI of 24.89 kg/m<sup>2</sup>. The eating behavior scores for cognitive restriction (CR), uncontrolled eating (UE) and emotional eating (EE) were determined based on score out of a total of 28 possible points. Variables of BMI and year in school showed strong influences in developing eating

behaviors, CR, UE and EE. Weight cycling had an inverse relationship between percent weight change and attempting to lose weight in college and between BMI and weight change.

### Conclusion

Year in school demonstrates being at risk for eating and weight control behaviors. With the majority of the study population within the “normal weight range,” almost half reported to be normal weight while the other half had perceptions that they were overweight. There needs to be more research to investigate influences for eating and weight control behaviors and the prevalence of weight cycling on a college campus. This research gives a good snap shot into how several individual and external factors can impact health behaviors in the emerging adulthood population.

KEYWORDS: weight cycling; dieting; weight control behaviors; eating behaviors; college students, weight management

THE RELATIONSHIP BETWEEN EATING BEHAVIORS AND WEIGHT CYCLING  
AMONG COLLEGE STUDENTS

KAYLA VALLUZZI

A Thesis Submitted in Partial  
Fulfillment of the Requirements  
for the Degree of

MASTER OF SCIENCE

Department of Family and Consumer Sciences

ILLINOIS STATE UNIVERSITY

2022

©2022 Kayla Valluzzi

THE RELATIONSHIP BETWEEN EATING BEHAVIORS AND WEIGHT CYCLING  
AMONG COLLEGE STUDENTS

KAYLA VALLUZZI

COMMITTEE MEMBERS:

Jennifer Barnes, Chair

Julie Reader Schumacher

Tammy Harpel

## ACKNOWLEDGMENTS

I would like to thank my committee members, Dr. Jennifer Barnes, Dr. Julie Schumacher and, Dr. Tammy Harpel for their support and guidance throughout the thesis process. I appreciate the abundance of learning opportunities and skills that I will be able to translate into my career as a healthcare professional.

Thank you to my colleagues and fellow dietetic interns for their support and encouragement in the completion of my thesis. Your hard work and dedication to this field does not go unnoticed. I also want to thank the unwavering support from my friends and family on the East Coast, without your love and encouragement I would not be where I am today.

K.V

## CONTENTS

|   | Page |
|---|------|
| ACKNOWLEDGMENTS   | i    |
| TABLES  | iv   |
| CHAPTER I: THE RELATIONSHIP BETWEEN EATING BEHAVIORS AND WEIGHT<br>CYCLING AMONG COLLEGE STUDENTS | 1    |
| Introduction  | 1    |
| Methodology   | 3    |
| Participants  | 3    |
| Instruments   | 4    |
| Statistical Analysis  | 4    |
| Results   | 5    |
| Demographics  | 5    |
| Weight Cycling  | 6    |
| The Relationship Between Demographics, Weight and Eating Behaviors                                | 6    |
| Differences Between Demographics and Eating Behavior Scales                                       | 7    |
| Effects of Demographics on Eating Behaviors and Weight Cycling                                    | 7    |
| Discussion  | 8    |
| Diet Behaviors  | 8    |
| Weight Cycling  | 11   |
| Strengths and Limitations   | 12   |
| Future Directions   | 13   |
| Conclusion  | 14   |



|  |    |
|--|----|
| CHAPTER II: EXTENDED LITERATURE REVIEW | 19 |
| Weight Gain/Regain                     | 25 |
| Weight Cycling                         | 27 |
| Disordered Eating Behaviors            | 28 |
| REFERENCES                             | 32 |
| APPENDIX A: SURVEY                     | 37 |

## TABLES

| Table   | Page |
|---|------|
| 1.1: Relationship Between BMI and Weight Change   | 16   |
| 1.2: Relationship Between BMI and Eating Behavior Scales                                | 16   |
| 2.1: Differences Between Females vs Non-females and Eating Behavior Scales              | 16   |
| 2.2: Differences Between White and Non-White Participants and Eating Behavior Scores    | 16   |
| 2.3: Differences Between Undergraduate and Graduate Students and Eating Behavior Scores | 17   |
| 3.1: Effect of Year in College on Eating Behavior Scales                                | 17   |
| 3.2: Effect of Ethnicity on Experiencing Conscious Weight Loss Attempts                 | 17   |
| 3.3: Effect of Year In School on Experiencing Conscious Weight Loss Attempts            | 17   |
| 3.4: Effect of Year in School on Attempting to Lose Weight Since Starting College       | 18   |
| 3.5: Effect of Ethnicity on Attempting to Lose Weight Since Starting College            | 18   |
| 3.6: Effect of Ethnicity on Increasing Diet Behaviors Since Starting College            | 18   |
| 3.7: Effect on Year in School on Increasing Diet Behaviors Since Starting College       | 18   |

# CHAPTER I: THE RELATIONSHIP BETWEEN EATING BEHAVIORS AND WEIGHT CYCLING AMONG COLLEGE STUDENTS

## **Introduction**

The prevalence of dieting has been increasing over the last several decades. Not only are obese and overweight individuals attempting to lose weight but, there has been an increase in the proportion of normal weight individuals who want to lose weight (Rhee, 2017). Dieting is defined as “the practice of eating food in a regulated fashion to decrease, maintain or increase bodyweight; restricting oneself to small amounts or special kinds of food in order to lose weight” (Rhee, 2017, p 237). According to National Health and Nutrition Examination Survey (NHANES), data shows that the percentage of normal weight individuals who have attempted to lose weight has increased between mid-1990’s and 2003-2008 from 37% to 46% for women and 11% to 19% for men (Dennett 2017). Types of dieting behaviors include uncontrolled eating, emotional eating, restrictive eating, fad diets that omit certain food groups or substances from intake, meal skipping, smoking for appetite suppression, excessive exercising and the consumption of stimulants such as caffeine and energy drinks (Cappelleri et al., 2009; Ferraro et al., 2015).

There has been an increasing concern over the last two decades about weight control behaviors in younger people, the emerging adulthood population (ages 18-24). This population has been associated with increased risk for dieting, binge eating and psychological comorbidities such as low self-esteem, poor body image and depression (Viner et al., 2006). Today, in a culture that puts an emphasis on being thin, younger individuals become preoccupied with their physical appearance to achieve a body image that is constructed by society (Spear, 2006). With emerging adulthood previously considered a “time of good health,” there is now concern associated with

the time period based on critical life changes, autonomy, preparing and choosing food items and eating habits/behaviors that can translate into adulthood (Stok et al., 2018). Furthermore, there is a growing body of evidence that demonstrates increasing amounts of “eating disturbances” and excessive concerns for body weight among college and university students (Din et al., 2019). To continue, college aged women may be at an increased risk for body dissatisfaction and disordered eating practices related to weight gain that occurs during this time, exposure to societal ideals of weight perceptions and active use of social media platforms that increase the image of thinness and fit ideals (Aparicio-Martinez et al., 2019). Almost 90% of young people ages 18-29 report being active users of social media outlets such as Facebook, Instagram for communication and “peer generated” content (Aparicio-Martinez et al., 2019). Studies have shown that many of the influencers on social media platforms advertise diets, muscular ideals and even surgery which emphasizes negative weight perceptions for young women leading to negative mental and physical health (Aparicio-Martinez et al., 2019). With many individual, social and environment influences that impact body image, weight perceptions and health behaviors, and emerging adulthood age is an important time to help influence positive health behaviors to promote health benefits into adulthood.

The influences on body image, weight perception and weight control behaviors surrounding college-aged individuals, can lead to a continuous cycle of weight fluctuations. Research has shown that an estimated 80% of individuals who intentionally lose more than 10% of their body weight will regain it within 1 year (Dennett, 2017). These bouts of weight loss and eventual weight regain is called weight cycling. Weight cycling, which can include one large weight cycle or multiple small weight cycles depending on the individual, can cause negative health consequences to the body increasing the risk for adipose and cardiovascular related

comorbidities (Rhee, 2017; Dennett, 2017). Other consequences of weight cycling include increased risk for eating disorders, psychological disorders, and bone fractures (Rhee, 2017).

The existing literature on diet related behaviors and weight cycling on college students is understudied and limited. Many of the studies focused on diet related behaviors and techniques to lose weight in children or older adults who are overweight or obese. The research that focused on college students targeted the overweight or obese populations, treatment methods and eating behaviors such as fast food intake, alcohol consumption, stress and mental health. Although many of those factors can contribute to weight gain seen in college students, it did not explain the prevalence of weight cycling patterns among this population. In addition, there was a lack of diversity in the research including studies that mainly consisted of women who were overweight or obese. Although women have shown to be more vulnerable to influences for weight control behaviors, research should include both males and females. In order to assess the influence of weight control behaviors and weight cycling, more research should investigate the emerging adulthood age with both male and females, race and ethnicity with varying weight statuses.

Therefore, the aim of this study was to investigate the influences that contribute to diet and weight control behaviors and the presence of weight cycling among college students. This study may help determine the risk of exposure to weight management practices in this age group, which can provide more strategic health promotion strategies regarding eating behaviors, nutrition education, body image, and weight management methods.

## **Methodology**

### **Participants**

Students at Illinois State University were invited to participate in a Qualtrics survey distributed via email. Two emails for survey responses were sent out two weeks apart to help

improve participation. Inclusion criteria included being a current student at the university between the ages of 18 and 24.

### **Instruments**

Demographic data, diet related behaviors and weight history were assessed. There were a total of 35 questions in the survey. Questions 1-20 were created from the Three Factor Eating Questionnaire (TEFQ) to assess three different aspects of eating including cognitive restrained (CR), uncontrolled eating (UE), and emotional eating (EE) (de Lauzon et al., 2004). Questions from the TEFQ, were able to assess the current diet behaviors among students. The questions ranged on a 4-point scale where those who selected a higher score indicated a higher rate of diet behaviors. The scores for each question were added to create a total score for CR, UE and EE. The eating behavior scores for CR, UE and EE were determined based on score out of a total of 28 possible points. The second part of the survey, questions 21-35, was created from the National Health and Nutrition Examination Survey (NHANES) 2017-2018 under the category of “Weight History” where past and present weight related questions were asked to assess the evidence of weight cycling, weight loss and weight control behaviors (See Appendix A).

### **Statistical Analysis**

SPSS statistical software (Version 26) was utilized to calculate descriptive statistics including the mean, standard deviation and frequencies for demographic variables of age, gender, Body Mass Index (BMI), year in school, and ethnicity. Researchers computed new variables to assess relationships between female and non-female participants, white and non-white participants and undergraduate and graduate students. Percent weight change was calculated by subtracting the current weight from the participant’s weight stated 1 year ago, divided by current weight and multiplied by 100. The percent weight change variable was used

to examine the evidence of weight loss or gain, weight cycling and their relationship between weight loss methods collected from the survey. A Pearson correlation was used to test the strength of the relationships between the demographics and calculated eating behavior scales, weight change and calculated Body Mass Index (BMI).

Independent t-tests were conducted to assess if there was a difference between gender (female vs non-female), ethnicity (white vs non-white), year in school (undergraduate vs graduate) and the eating behavior scales. A one-way ANOVA was utilized to determine if there was a statistically significant difference between variables.

## **Results**

### **Demographics**

The total number of participants between the ages of 18 to 24 years old was 351 participants. The average age for those who participated in the survey was 20.5 years old (SD= 1.675). The preferred gender of participants included 267 (76.1%) female, 75 (21.4%) male and 9 (2.6%) identified as non-binary. The ethnicity included 83.2% non-Hispanic/white, 3.4% African American/Black, 6.3% Hispanic, 4.3% Asian and 2.8% “other.” Separating participants by year in school yielded, 22.5% freshman, 24.8% sophomore, 22.5% junior, 17.4% senior and 12.8% graduate students. The majority of those who participated in the survey were currently enrolled as undergraduate students (306, 87.2%) compared to graduate students (45, 12.8%) and the majority of those participating in the survey were of white ethnicity (n=292, 83.2%) compared to non-white (n=59, 16.8%). The majority of participants showed to be in the “normal weight” category with an average BMI of 24.89 kg/m<sup>2</sup> (SD= 5.965, Mode= 22.3 kg/m<sup>2</sup>, Min= 15.8 kg/m<sup>2</sup>, Max= 54.8 kg/m<sup>2</sup>). Participants with higher scores demonstrated a higher potential

of utilizing specific eating behaviors. The average score of participants for CR was 16.2 (SD=4.6), UE was 15.6 (SD=3.8) and EE was 15.5 (SD=5).

### **Weight Cycling**

In order to investigate evidence of weight loss and subsequent weight cycling among participants, percent change was calculated by subtracting the current weight from weight from one year ago divided by the current weight and multiplied by one hundred in order to get a percentage. The average percent weight change for participants was -.74 lbs and the median was -1.2 lbs. In addition, the survey assessed how students considered their weight as either underweight, about the right weight or overweight. The results presented that almost half of the participants considered themselves at just the right weight (48%) or overweight (41%). To assess the weight loss methods, students selected a variety of examples of weight loss methods they have previously or are currently using. Frequent responses demonstrated that 136 participants chose “exercise,” 130 participants chose “Ate less (decreased intake),” 124 participants chose “ate more fruits and vegetables,” 115 chose “ate less sugar, candy and sweets,” and 123 chose “ate less junk food or fast food.” Furthermore, the survey asked if the weight change between present time and a year ago was intentional. The most frequent response for individuals completing this survey was “no, the changes in their weight now and a year ago were not intentional” (58.4%, 205 participants).

### **The Relationship Between Demographics, Weight and Eating Behaviors**

Table 1.1 describes the relationships between BMI, demographic variables and weight change. The relationship between BMI and weight change demonstrates a significant, negative, relationship showing that when BMI increases, weight change has the potential to decrease. Results showed there is a non-significant relationship between BMI and year in school, gender and ethnicity. Lastly, Table 1.2 explains data for the relationship between BMI and eating



behavior scales (CR, UE and EE). BMI has a significant positive relationship with all three eating behavior scales. Therefore, the relationship shows that when BMI increases the CR, UE and EE total scores have the potential to increase as well.

### **Differences Between Demographics and Eating Behavior Scales**

Table 2.1 reviews the statistical differences between gender, ethnicity, year in school and eating behavior scales. Results presented that females had a statistically significant mean difference between EE total score than non-females. They showed to have a higher total EE score than non-females. Differences between gender and eating behavior scores displayed that females had a higher total CR score than non-female participants; however, this difference was non-significant. To continue, on average, females had a slightly higher total UE score than non-females; however, this difference was not statistically significant. The independent t-test for ethnicity and eating behavior, shown in Table 2.2, revealed that on average, white and non-white individuals had a higher total score for CR than for UE and EE. However, these differences were not statistically significant between the ethnicity of white vs non-white students and the total eating behavior scales.

Table 2.3 displays the results of the independent t-test conducted for year in school and eating behavior scales showed that on average, undergraduate and graduate students had a higher total score for CR than for EE however, these differences were not statistically significant. On average, graduate students had a higher total score for UE than undergraduate students however, this difference was not statistically significant at the .05 level,  $t(348)=-.644, p=.520$ .

### **Effects of Demographics on Eating Behaviors and Weight Cycling**

One-way ANOVA was used to assess differences between and within groups on eating behavior scales, weight cycling behaviors, and demographic variables. Tables 3.4 and 3.5 present a significant effect of year in school and attempting to lose weight since starting college.

A Tukey post hoc test revealed that the mean for freshman year was significantly higher than the mean for senior year ( $p = .003$ ) however, there were no differences between other years. However, there was a non-significant effect of ethnicity on attempting to lose weight since starting college, showing that ethnicity did not have a strong influence in attempting to lose weight since starting college. Table 3.1 shows that the mean total score for CR, UE and EE was not as different by year in school. As a result, year in school does not have a significant effect and does not strongly influence eating behavior scores. Tables 3.2 and 3.3 represent ANOVAs for ethnicity and year in school and experiences of consciously attempting to lose 10 or more pounds. Data presented a non-significant effect on consciously losing weight with the ethnicity and year of students. Therefore, ethnicity and year in school did not have a strong influence for consciously attempting to lose weight.

Lastly, Tables 3.6 and 3.7 present the effect of ethnicity and year in school on increasing diet behaviors since starting college. There was a significant effect on the year in school, but a non-significant effect of increasing diet behaviors since starting college and the ethnicity of participants. A Tukey post hoc test revealed that the mean for freshman year was significantly higher than the mean for junior year ( $p = .05$ ).

## **Discussion**

### **Diet Behaviors**

Previous research showed a growing prevalence of “eating disturbances” and excessive concerns for body weight among college and university students, which can potentially lead to eating disorder and weight control behaviors (Din et al, 2019). To support this research, based on the risk associated with internal and external influences for college-aged individuals, the eating

behavior scores should reflect relatively high numbers for cognitive restriction (CR), unrestrained eating (UE) and emotional eating (EE), measured in this study. The results for eating behavior scales CR, UE and EE demonstrated higher scores for total points with mean scores ranging from 15.46 to 16.23 out of a total 28 possible points. There were several significant results for the eating behavior scales in this study population. There was a significant relationship between percent weight change and CR eating behavior scale. The results demonstrated that when the scores for CR increase, percent weight change moves in the same direction, increasing as well. Therefore, when individuals restrict caloric intake, this can result in having a positive linear relationship with weight fluctuations. The CR eating behavior scale includes restricting food and calories which, is considered the “unhealthiest” way to lose weight based on negative metabolic effects and long-term health outcomes (Quaidoo et al., 2018). Consciously restricting food has the ability to influence bouts of weight cycling based on physiologic and metabolic pathways for weight regain while disrupting hormone signaling contributing to the development of other eating and weight control behaviors such as UE and EE.

In addition, the study found that BMI had a significant, positive relationship with all three eating behavior scores. Therefore, when BMI increases there is a potential for CR, UE and EE behaviors to increase as well. Within the healthcare field, emerging research continues to show that BMI is not a good indication of overall health and weight status because it does not consider an individual’s muscle mass. However, an increasing BMI score has the potential to influence an individual’s overall perception of weight, which can contribute to altering weight status using eating or weight control behaviors. The data supports the research, displaying that during emerging adulthood, students are continuing to form their own opinions and behaviors with increased autonomy. As a result, a majority of women within the emerging adulthood population

continue to change how they look based on certain ideologies and standards of beauty that they consider physically attractive and socially acceptable (Quaidoo et al., 2018). Similarly, in this study, females showed to have a higher total EE score than non-females. This data supports the claims made by Perkiewicz et al, 2021, which found that overeating, anxiety and mood dependent eating was more common in females (65.5%) than males.

To continue, the variable “year in school” had an influence on increasing diet behaviors since starting college. The data suggests there is an increased risk of developing eating or weight control behaviors within the emerging adulthood population, specifically shown between freshman and junior year of college. As a result, age could be used as a predictor variable based on the risk for the emerging adulthood population in combination with individual and environmental factors during the transition to adulthood/independence.

Moreover, the majority of the data from this study supports previous research that shows how this specific target population of college/university students are at risk for eating control behaviors for weight management. Common risk factors include mood/emotion related eating, self-regulation or control over food, weight perceptions and increased autonomy during this time. However, the evidence for weight cycling and weight loss methods seem to contradict previous research. Participants in this study were asked about weight loss methods they have experienced. The most frequent answers included increasing exercise, decreasing intake, choosing more fruits and vegetables and decreasing junk food intake. Although decreasing intake was a popular answer, a variety of students were also being more conscious of the food items they choose paired with increasing physical activity. However, this question does not specify details about how students were decreasing overall intake, whether it involved cognitive restriction or other eating control behaviors.. To continue, this question does not take into account the overall health

behaviors during this time period where COVID-19 protocols were in place. The participants completing this survey were taking online classes but could have been at home or on campus, which could influence weight gain or loss, available resources, access to food and, mental/physical health that can influence eating behaviors and weight. Therefore, external factors surrounding the pandemic need to be considered.

### **Weight Cycling**

Previous research has shown that university students are at an increased risk for developing inappropriate weight loss practices regardless of weight status (Wharton & Hampl, 2008). Almost half the participants considered themselves at just the right weight (48%) or overweight (41%). Wharton et al. (2008) showed that most college-aged individuals have misperceptions of their weight, viewing themselves as overweight or obese, which can contribute to weight control behaviors. Although this question was not asking if participants were satisfied with their current weight status, the results of this study regarding weight perceptions showed almost half of participants chose “overweight” even with the mean BMI being 24.9, which is considered “healthy or within normal limits.” Therefore, the results presented some evidence of body dysmorphic characteristics compared to the average BMI from the study.

Furthermore, there was a significant effect of year in school and attempting to lose weight since starting college. Thus, year in school had an influence in participants attempting to lose weight during this emerging adulthood time period, regardless of being on a college campus. This supports the hypothesis that college aged individuals contribute to the risk for eating and weight control behaviors based on individual factors such as independent decision making and health behavior formation. To assess certain external influences, there was a question regarding body image and social media in the survey. The question asked participants how influential

social media was on their body image, weight loss and the desire to be thinner. The most frequently reported answer was “very influential” with 23% of the study population responding that social media contributes to body image and weight perceptions. This is a relatively low percentage compared to research showing that 90% of young people ages 18-29 are using some sort of social media platform (Aparicio- Martinez et al., 2019).

To continue with assessing weight cycling among this population, the results showed that there is a negative relationship between percent weight change and those who attempted weight loss since starting college. Therefore, as percent weight change decreases, the attempt for weight loss since starting college increases. Similarly, participants were asked if the change between their weight from a year ago and their weight now, was intentional. Over half of participants responded that their weight change was not intentional (58.4%). To support the argument that the emerging adulthood population is associated with patterns of weight cycling, the data would represent the vast majority choosing “yes” that their weight change or loss was intentional. However, this question does not address if this was an unintentional weight loss or gain over the last year. Similarly, the environment relating to the COVID-19 pandemic protocols could have had a significant impact on these weight changes. Overall, there should be more research to understand the prevalence of weight cycling experiences among college students related to the abundance of individual and external influences.

### **Strengths and Limitations**

There are many strengths and limitations of this study. The survey response was larger than expected even after targeting a specific population group of 18-24 years old (emerging adulthood). Providing a survey is cost effective, flexible with responses, time organized and responses are able to remain anonymous.

On the other hand, there were several limitations to note. A large limitation in assessing external influences relating to living on a college campus was the timeframe this data was collected. During the release of the survey, many students were taking online classes from home with COVID-19 pandemic protocols. Therefore, eating habits, food availability and overall health during this time could have the potential to skew interpretations for these results for health behaviors. To continue, there was not much diversity among ethnicity and gender from the study population, which was something found among the previously published research. Weight status (height, weight, etc) was not physically measured but relied on self-reporting and therefore could be inaccurate or unreliable answers. Although a wide variety of questions and topics were covered, there could have been more questions to assess socio-economic and overall nutrition status as well as weight perception and body dissatisfaction questions to emphasize the risk for this specific population.

### **Future Directions**

This study was able to investigate eating behaviors in 18-24 year old's, the influences for these behaviors, current weight management methods and evidence of weight fluctuations over time. Therefore, this study provides a good snapshot into how several internal and external influences can impact health behaviors in this specific population. Year in school had a significant influence on attempting to lose weight since starting college, specifically freshman year students had a higher mean score than junior year students. As a result, it is important to acknowledge the influences and risk factors based on the emerging adulthood time period where health behaviors are developed and translated into adulthood. Health professionals targeting this population need to understand how to provide the most beneficial health marketing, resources and information at an early age to help prevent future shape healthy long term health behaviors.

These include health promotion strategies that can relay positive information for eating healthy in combination with body image and weight loss awareness as well. Although there is no control in the decision making processes of individuals, it is important to provide resources that can impact the emerging adulthood population to make better health decision for positive health outcomes into adulthood.

### **Conclusion**

The emerging adulthood population (ages 18-24), once thought of as a transition into good health, has gradually become an at-risk population. Within this population, there are health behavior concerns associated with critical life changes such as increased autonomy/independence and eating, and weight control behaviors that can lay the foundation for eating and health habits into adulthood. The study aimed to investigate the influences that may have an impact on eating behaviors and weight cycling patterns for this population. The results concluded that year in school contributes to the risk of developing eating and weight control behaviors especially between upper and lower classmen. However, instead of students utilizing many of the unhealthy fad diets that are thought to be influential in this age group, it seems like students are choosing to eat healthier food items paired with exercise for their weight loss methods. However, a large limitation to this outcome is the timeframe being in an online/ at home environment due to COVID-19 pandemic protocols, which can contribute to varying responses for eating and weight control behaviors. Overall, year in school and BMI had an influence over diet behaviors and increased risk for students developing these as weight control behaviors. There needs to be more research regarding the evidence of weight cycling and weight perceptions within this population, taking into consideration the current timeframe for this study. It is important to understand the influences and risk regarding health behaviors in this population to increase strategic positive



health promotions for nutrition and eating behaviors, body image and weight loss for individuals ages 18-24.

### 1.1: Relationship Between BMI and Weight Change

| Variable      | Body Mass Index (BMI) |        |         |
|---------------|-----------------------|--------|---------|
|               | n                     | r      | p value |
| Weight Change | 305                   | -0.235 | *<.0001 |

\*Significance ( $p < 0.05$ )

### 1.2: Relationship Between BMI and Eating Behavior Scales

| Eating Behavior Scale | Body Mass Index (BMI) |       |         |
|-----------------------|-----------------------|-------|---------|
|                       | n                     | r     | p value |
| CR                    | 339                   | 0.155 | *.004   |
| UE                    | 342                   | 0.216 | *<.0001 |
| EE                    | 343                   | 0.285 | *<.0001 |

Cognitive Restriction (CR); Unrestrained Eating (UE); Emotional Eating (EE)

\*Significance ( $p < 0.05$ )

### 2.1: Differences Between Females vs Non-females and Eating Behavior Scales

|    |            | n   | Mean  | SD    | t      | p value |
|----|------------|-----|-------|-------|--------|---------|
| CR | Female     | 264 | 16.46 | 4.664 | -1.696 | 0.091   |
|    | Non-female | 83  | 15.48 | 4.354 |        |         |
| UE | Female     | 266 | 15.76 | 4.019 | -0.376 | 0.707   |
|    | Non-female | 84  | 15.94 | 3.295 |        |         |
| EE | Female     | 267 | 15.97 | 5.012 | -3.408 | *.001   |
|    | Non-female | 84  | 13.86 | 4.807 |        |         |

Cognitive Restriction (CR); Unrestrained Eating (UE); Emotional Eating (EE)

\*Significance ( $p < 0.05$ )

### 2.2: Differences Between White and Non-White Participants and Eating Behavior Scores

|    |           | n   | Mean  | SD    | t     | p value |
|----|-----------|-----|-------|-------|-------|---------|
| CR | White     | 289 | 16.21 | 4.553 | -0.15 | 0.468   |
|    | Non-white | 58  | 16.31 | 4.896 |       |         |
| UE | White     | 291 | 15.98 | 3.893 | 0.845 | 0.855   |
|    | Non-white | 59  | 15.51 | 3.66  |       |         |
| EE | White     | 292 | 15.55 | 5.036 | 0.695 | 0.719   |
|    | Non-white | 59  | 15.05 | 5.077 |       |         |

Cognitive Restriction (CR); Unrestrained Eating (UE); Emotional Eating (EE)

\*Significance ( $p < 0.05$ )

### 2.3: Differences Between Undergraduate and Graduate Students and Eating Behavior Scores

|    |               | n   | Mean  | SD    | t      | <i>p</i> value |
|----|---------------|-----|-------|-------|--------|----------------|
| CR | Undergraduate | 303 | 16.18 | 4.627 | -0.489 | 0.625          |
|    | Graduate      | 44  | 16.55 | 4.49  |        |                |
| UE | Undergraduate | 306 | 15.85 | 3.852 | -0.644 | 0.52           |
|    | Graduate      | 44  | 16.25 | 3.895 |        |                |
| EE | Undergraduate | 306 | 15.46 | 5.041 | -0.062 | 0.95           |
|    | Graduate      | 45  | 15.51 | 5.084 |        |                |

Cognitive Restriction (CR); Unrestrained Eating (UE); Emotional Eating (EE)

\*Significance ( $p < 0.05$ )

### 3.1: Effect of Year in College on Eating Behavior Scales

|    | F value | <i>p</i> value |
|----|---------|----------------|
| CR | 0.312   | 0.87           |
| UE | 0.69    | 0.6            |
| EE | 1.342   | 0.254          |

Cognitive Restriction (CR); Unrestrained Eating (UE); Emotional Eating (EE)

\*Significance ( $p < 0.05$ )

### 3.2: Effect of Ethnicity on Experiencing Conscious Weight Loss Attempts

|           | df | F value | <i>p</i> value |
|-----------|----|---------|----------------|
| Ethnicity | 4  | 1.92    | 0.107          |

\*Significance ( $p < 0.05$ )

### 3.3: Effect of Year In School on Experiencing Conscious Weight Loss Attempts

|                | df | F value | <i>p</i> value |
|----------------|----|---------|----------------|
| Year in School | 4  | 2.068   | 0.085          |

\*Significance ( $p < 0.05$ )

### 3.4: Effect of Year in School on Attempting to Lose Weight Since Starting College

|                | df | F value | <i>p</i> value |
|----------------|----|---------|----------------|
| Year in School | 4  | 3.777   | *.005          |

\*Significance ( $p < 0.05$ )

### 3.5: Effect of Ethnicity on Attempting to Lose Weight Since Starting College

|           | df | F value | <i>p</i> value |
|-----------|----|---------|----------------|
| Ethnicity | 4  | 0.471   | 0.757          |

\*Significance ( $p < 0.05$ )

### 3.6: Effect of Ethnicity on Increasing Diet Behaviors Since Starting College

|           | df | F value | <i>p</i> value |
|-----------|----|---------|----------------|
| Ethnicity | 4  | 0.23    | 0.921          |

\*Significance ( $p < 0.05$ )

### 3.7: Effect on Year in School on Increasing Diet Behaviors Since Starting College

|                | df | F value | <i>p</i> value |
|----------------|----|---------|----------------|
| Year in School | 4  | 3.148   | *.015          |

\*Significance ( $p < 0.05$ )

## CHAPTER II: EXTENDED LITERATURE REVIEW

The obesity epidemic in the United States has turned into a nationwide health and economic crisis. In 2017-2018, the prevalence of obesity was reported to be 42.2% of the population and having costs estimating \$147 billion (Centers for Disease Control, 2020). The increasing rates of obesity emphasize the use of weight control or management methods among individuals in society. However, there are a variety of other contributing factors for the desire to control weight such as an obesogenic environment and the promotion of “thinness” through social media and the diet industry. The diet industry, estimating \$150 billion annual turnover in the US and Europe, promotes “too good be true” weight loss methods that are unregulated and may be unsafe for consumers (Ferraro et al., 2015; Dulloo & Montani, 2015). The National Health and Nutrition Examination Survey (NHANES) 2003-2008 reported that 57% of women and 40% men desired to weigh less or were currently dieting (Rhee, 2017).

The prevalence of dieting has been increasing over the last several decades. Not only are obese and overweight individuals attempting to lose weight, there has been an increase in the proportion of normal weight individuals who want to lose weight (Rhee, 2017). According to NHANES, data show that the percentage of normal weight individuals who have attempted to lose weight has increased between mid-90’s and 2003-2008 from 37% to 46% for women and 11% to 19% for men (Dennett, 2017). Dieting is defined as “the practice of eating food in a regulated fashion to decrease, maintain, or increase bodyweight; restricting oneself to small amounts or special kinds of food in order to lose weight” (Rhee, 2017, p 237). Types of dieting behaviors include uncontrolled eating, emotional eating, restrictive eating, fad diets that omit certain food groups or substances from intake, meal skipping, smoking for appetite suppression,

excessive exercising, and the consumption of stimulants such as caffeine and energy drinks (Cappelleri et al., 2009; Ferraro et al., 2015).

Although the weight loss industry, estimating \$58.6 billion annually, provides healthful practices, many people turn to the advertisement of fad diets that promise a “quick fix” (Bacon & Aphramor, 2011). Ferraro et al states that clients who participate in weight loss programs and fall short of their weight reduction goal, often feel discouraged which drives them towards more radical approaches for weight loss such as fad diets and commercial products (Ferraro et al, 2015). For example, some of the top diet plans for 2020 included the ketogenic diet, high protein diet, intermittent fasting, calorie based (limiting to 800-1200 calories per day), Weight Watchers, Nutrisystem and vegan or vegetarian diets (Schmidt, 2020). To put this caloric deficit into perspective, the *Dietary Guidelines for American’s* estimate that toddlers ages 12-23 months should be consuming between 700-1,000 calories per day (*Dietary Guidelines for Americans, 2020-2025*). The recommended amount of calories to consume for females ages 19-30 is between 1800-2400 calories and men within this age group are recommended to consume 2400 to 3000 calories/day.

Although these diets provide short-term weight loss, accounting for that “quick fix,” the National Institutes of Health state “one to two thirds of the weight is regained within one year (after weight loss) and almost all is regained within 5 years” (Bacon & Aphramor, 2011, p 5). Dieting reflects sporadic or chronic behaviors that modify dietary intake ranging from increased consumption of nutritious foods to extreme dietary restriction. Therefore, dieting may be able to accomplish short-term weight loss, but this is usually not sustained. There are many consequences from dieting such as weight regain which poses a risk for obesity, weight cycling and disordered eating behaviors that can have detrimental effects to the mind and body. Current

research demonstrates the importance of healthy weight loss and obesity prevention in children and older adults, but there is a lack of information regarding the emerging adulthood population, ages 18-25 (Nelson et al., 2008).

There has been an increasing concern over the last two decades about weight control behaviors in younger people such as dieting, binge eating and psychological comorbidities such as low self-esteem, poor body image and depression (Viner et al, 2006). With emerging adulthood previously considered a “time of good health,” there is now concern associated with the time period based on critical life changes, autonomy, preparing and choosing food items and eating habits/behaviors that can translate into adulthood (Stok et al 2018). In a review conducted by Stok et al, researchers investigated current literature of the influences for eating behavior change during this time of emerging adulthood. They found that over 100 factors affected eating behavior, a majority being individual level factors. These individual level factors included psychological drivers such as mood/emotion relating to boredom, self-regulation or control over food, health conscious eating intentions, food knowledge, skills and ability to cook and prepare food, food beliefs and barriers to healthy eating in this environment, past food habits from childhood, and dietary restraint for weight control behaviors (Stok et al 2018). Furthermore, there is a growing body of evidence that demonstrates increased prevalence of “eating disturbances” and excessive concerns for body weight among college and university students (Din et al 2019). A study conducted by Din et al (2019) examined the prevalence of eating disorder (ED) risk differentiated by sex among college students. The study displayed that age, sex, cultural transition, urbanization, westernization, media induced and psychological factors of stress, body shape concern were perceived risk factors for ED. In addition, the data concluded that age is a significant predictor of ED in female students, with younger girls being more at risk

than those at a higher grade level and peer pressure was a significant predictor of ED risk in males (Din et al 2019). Therefore, the study found that age was a significant predominant factor in ED risk, indicating that the emerging adulthood population is considered high risk (Din et al., 2019).

The emerging adulthood age group is not only a transition into physical independence and choices, it is also a time where individuals are forming their own opinions and ideologies which most often includes what determines physical attractiveness (Quaidoo et al., 2018). With making personal connections and finding a partner a big focus for this population, physical attractiveness is a concern for college and university aged individuals. Most young people strive to live up to the standards of beauty that have been set by their society, usually in combination with being a specific weight status, therefore contributing to various weight management techniques to change or maintain appearances (Quaidoo et al., 2018). Today, in a culture that puts an emphasis on being thin, younger individuals become preoccupied with their physical appearance to achieve the “appropriate” body image constructed by society (Spear, 2006). Lee et al (2018) states, the notion of the “Freshman 15” may be enough testament that the college setting presents a particular challenge to a young person’s weight as they transition into adulthood.”

There are a lot of changes and influences that impact these specific individuals such as diet and physical activity that can contribute to emerging adulthood as a higher risk population (Lee et al, 2018). These influences come from friends, family, health professionals and social media outlets that portray a slim body as “the right body” (Dulloo & Montani, 2015). Studies show 40-50% of young girls, regardless of overweight or normal weight, want to lose weight to be like the celebrities or figures they see online (Rhee, 2017). National data has shown that college age women are more vulnerable to weight loss practices compared to men (Wharton CM



& Hampl JS, 2008). A national study of adolescents found that weight control behaviors were linked to individuals perceptions of their own body weight rather than the actual weight status (Lee et al, 2018). To continue, college and university students are “more prone to using inappropriate weight loss practices” (Wharton & Hampl, 2008).

A study conducted in Ghana, Africa focused on weight perceptions and the merging adulthood population. The study demonstrated that more than half of the study population was dissatisfied with their current weight status and were actively attempting to change their weight (Quaidoo et al., 2018). The study identified three main strategies for weight loss practices within the study population, physical activity, lifestyle modifications and using methods of dieting to lose weight. Although this study was conducted in another continent, researchers found that weight perceptions were a significant predictor of body size, which is influenced by social media across cultures. For example, the American ideals for body image are slimmer than in Ghanaian and Black cultures. However, with the growing population of people who have access to social media, many individuals have constant access to different celebrities, bodies and perspectives worldwide that display comparisons based on multi-societal views of what is promoted as “attractive” (Quaidoo et al., 2018). As a result, many of the study participants had different perceptions of their weight than original culture and values based on different influences that can impact weight perceptions.

In support of media influence and perception of weight, previous studies have also discovered that females perceive healthy and attractive weight to be lower than current weight and that media influence contributes pressure to be a certain weight (Harring et al., 2010). All in all, the study found that weight perception, which is heavily influenced by different social media platforms, is associated with nutrition status within the emerging adulthood population (Quaidoo

et al., 2018). Similarly, studies have found that with different challenges that come with emerging adulthood, independence, meal planning, and autonomy such as poor dietary practices; consuming foods higher in fat, sugar and sodium compared to choosing fruits, vegetables and low-fat dairy products (Harring et al 2010). Unhealthy eating practices can lead to a potential increase in weight and BMI. Thus, contributing to the claims that college students are identified as a vulnerable population for negative weight management strategies such as fasting, diet pills, laxatives or bingeing and purging behaviors (Harring et al, 2010).

Weight perceptions based on normative and societal views have an impressive impact on college students and weight management practices. Harring et al (2010) found that a majority of college women who were normal weight and overweight reported to actively trying to lose weight. In the literature, studies have also found that within both males and females, close friends have influences on weight control behavior (Harring et al, 2010). Social and environmental influences in combination with dieting were shown to be associated with body dissatisfaction and eating disorder symptoms in women (Wharton et al, 2008). In addition, studies have also found that body dissatisfaction and higher levels of eating disturbances were associated with higher levels of interference in academic achievement (Wharton et al, 2008).

College campuses have an abundance of information distribution methods that can impact students. Therefore, based on the risk for the emerging adulthood population, the university setting is very important in strategically promoting positive health practices regarding weight management, body image and weight control influences because they cater to a population where health behaviors lay the foundation for chronic disease prevention and long term health habits for adulthood (Wharton CM & Hampl JS, 2008). Knowing one's audience and what influences health behaviors is crucial for health promotion. Understanding the audience is

very important in health communication because when an individual has positive, realistic goals about their weight, they tend to show more appreciation and acceptance, which can have the potential to build healthier weight management methods (Quaidoo et al., 2018). Studies have shown that social connections and influences have an impact on how well information is received. As a result, health information and promotions should target peer groups such as sports teams, organizations, sororities, classes and residence halls (Harring et al., 2010).

Research has suggested that an early age of dieting behavior is associated with a greater BMI, higher restraint scale scores when eating and a greater use of riskier diets and weight cycling episodes for the future (Enriquez et al., 2013). Moreover, college is a critical timeframe where young adults establish long-term physical activity and eating behaviors. Therefore, the transition from adolescence to emerging adulthood is a high risk population for the development of eating disorders and weight control behaviors (Grammer et al., 2020). All in all, there are many internal and external influence that impact dieting behaviors which can pose consequences to the body such as weight gain or regain, weight cycling and disordered eating behaviors.

### **Weight Gain/Regain**

Weight gain after intentional dietary restriction is very common. Studies show dieters regain more weight than what was lost during their diet (Bacon & Aphramor, 2011). This can be explained by the body's adaptive physiological and biological mechanisms to sustain weight for survival. There is evidence suggesting that weight regain is associated with a concept called the "energy gap" (Melby et al, 2017). The energy gap states there is more energy desired than required. For example, altered peripheral factors can communicate the state of nutrient deprivation to the brain resulting in increased hunger and food cravings and decreased satiety levels (Melby et al, 2017). After a weight loss period due to food restriction, there is a biological

pressure to gain the lost weight back. This situation occurs as a function to increase hunger and reduced energy expenditure, which will cause a decrease in Resting Metabolic Rate (RMR) and the Thermic Effect of Food (TEF) (Melby et al, 2017).

Weight regain is also individualistic. This can be linked to gene regulation (epigenetics) that is related to the upper and lower limit for weight loss for an individual's body. Between this upper and lower limit is where behavior can influence bodyweight. The "set limits" are demonstrated when weight falls below the set range for individuals, genetically driven and physiologic changes promote restoration of body energy stores to promote survival (Melby et al, 2017). When individuals use dietary restriction for weight loss, homeostatic metabolism changes to promote weight regain. Unfortunately, when an individual gains weight and goes above the set point, there is not as strong of a defense in the opposite direction for weight loss. This can be associated with genetics and other factors like hormones circulating in the body (Melby et al, 2017). Therefore, there are stronger physiological defenses for weight gain after loss than there is for weight loss after weight gain.

Similarly, there is a strong biological defense involved in weight regulation for the body that consists of hunger signaling hormones leptin and ghrelin (Ferraro et al, 2015). Intentionally restricting ones dietary intake results in erratic nutrient delivery to the body. This can dysregulate hunger cues and the normal appetite system, which in turn promotes weight gain (Spear, 2006). With each weight loss, it becomes harder for the body to maintain the weight lost and with each restriction, there is an increase in food cravings resulting from the lack of nutrients being administered to the body. This can impact weight gain. Previous studies have also found that "people who cognitively restrict food and calories demonstrated eating more calories, foods higher in fat and sugar when stressed from work and social situations" (Harring et al, 2010, p

44). All in all, dietary restriction caused by restricted intake of food causes the denial of hunger cues and increased cravings to counteract the lack of calories being consumed resulting in bouts of weight loss and gain called weight cycling (Spear, 2006).

### **Weight Cycling**

Weight cycling is repeated cycles of intentional weight loss and unintentional weight regain, which can include one large weight cycle or multiple small weight cycles depending on the individual (Rhee, 2017 & Dennett, 2017). Research has shown that an estimated 80% of individual's who intentionally lose more than 10% of their body weight will regain it within 1 year (Dennett, 2017). According to Strohacker et al (2009) and Dulloo et al (2015), common reasons for weight cycling include the food environment related to an obesogenic environment, weight overshooting, adaptive thermogenesis and adaptive response to food supply (Dennett, 2017). Weight overshooting is when fat regain exceeds the amount lost (Dennett, 2017). Individuals who lose weight, including fat and lean muscle mass, will regain excessive amount of fat to provide the body with the complete recovery from the lean tissue lost based on metabolic shifts to increase lipid storage in the body (Dennett, 2017). Adaptive thermogenesis declines with weight loss, leading to increased hunger and appetite related to the loss of lean muscle potentially leading to overeating, which can contribute to the weight overshooting phenomenon (Dennett, 2017).

The “yo-yo effect” or constant fluctuation in weight can cause negative consequences for the body and increase the risk for adipose and cardiovascular related comorbidities. Studies have shown that repeat dieting is a strong predictor of weight gain, higher BMI and risk for obesity, especially among young individuals within the normal weight range (Dennett, 2017). The adipose related comorbidities can result in inflammation and increase the risk for obesity related

diseases such as insulin resistance, fluctuations in glucose and lipid levels and diabetes (Bacon & Aphramor, 2011). The weight fluctuations can also result in a higher risk for sarcopenic obesity (low muscle mass with higher fat mass) and increased stress to the heart with the constantly changing blood pressures and heart rate which increases cardiac load (Rhee, 2017 & Dennett, 2017). For example, studies have shown that women who participated in dieting displayed higher blood pressures than those who have not dieted (Bacon & Aphramor, 2011). Other consequences of weight cycling include increased risk for eating disorders, psychological disorders, and bone fractures (Rhee, 2017). Furthermore, research has shown that there is a greater risk for future disease with dieters of the normal weight group (Dennett, 2017). In a 2015 review, Abdul Dulloo states, “the lower the dieters initial body fat percentage, the higher the proportion of lean mass lost and the higher the proportion of fat mass gained” (Dennett, 2017).

### **Disordered Eating Behaviors**

Mental health problems, including disordered eating behaviors, are rapidly increasing among young women (Aparicio-Martinez et al, 2019). These behaviors, usually occurring in women in their twenties or adolescence, are defined as afflictions in which people suffer a severe disruption in their eating behaviors, thought and emotions (Aparicio-Martinez et al, 2019). Although eating disorders have a big psycho-biological component, social and environment factors also have an impact on the disease. Specifically, college aged women may be at an increased risk for body dissatisfaction and disordered eating practice related to the weight gain that occurs during this time, exposure to societal ideals of weight perceptions and active use of social media platforms that increase the image of thinness and fit ideals (Aparicio-Martinez et al, 2019).

Almost 90% of young people ages 18-29 report being active users of social media outlets such as Facebook, Instagram for communication and “peer generated” content (Aparicio-Martinez et al, 2019). Studies have shown that many of the influencers on those platforms advertise diets, muscular ideals and even surgery that emphasizes negative weight perceptions for young women leading to negative mental and physical health (Aparicio-Martinez et al, 2019). Therefore using social media may be a predictor for body dissatisfaction based on constant exposure to unrealistic fit ideals and weight perceptions that can lead to body image frustration. Body image frustration, especially for young people, can influence the use of maladaptive eating behaviors for weight loss practices and even go as far as surgical interventions to fit in with the physical attractiveness set by social media influencers. However, research notes that cultural factors come into play with body ideals that cannot be translated to all young people (Aparicio-Martinez et al, 2019).

To continue, The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) characterizes feeding and eating disorders as “a persistent disturbance of eating or eating related behaviors that results in the altered consumption or absorption of food and that significantly impairs physical health or psychosocial function” (American Psychiatric Association, 2017). The disorders related to this category of feeding and eating disorders include pica, rumination disorders, avoidant/restrictive food intake disorders, anorexia nervosa, bulimia nervosa and binge-eating disorder. With 46% of adolescents reporting to have attempted to lose weight, studies have shown that this presents an increased risk of unhealthy weight control behaviors leading into young adulthood (Enrique et al, 2013). College students are considered to be an at-risk population for these diet behaviors because this is a time where there is more independence and autonomy to influence their behaviors. In fact, 20-67% of college students

experience some disordered eating behavior (Grammer et al, 2020). To continue, a study conducted by Perkiewicz et al (2021) examined the differences in food choices and eating behaviors in young adults that contribute to eating disorder risk factors and perception of body image. The study population included 148 females and 27 males age 18-26. The study showed that body image influences the way they think about themselves in 76% of participants and that women were more prone to body perception influence based on the ideology of “being thin equals more attractive and successful” with 42.6% of females in the study pay more attention to their body weight in comparison to males (Perkiewicz et al 2021). In addition, the study showed that 66.3% of the study population screened for at risk of being diagnosed with an eating disorder (52% females and 69% males). Females (36.5%) admitted that they rarely over ate compared to males (11.11%) and felt as though they could not tell themselves to “stop eating” during a meal (30.4% females and 11.1% males). Similarly, overeating anxiety and mood dependent eating was more common in females than males (65.5%) (Perkiewicz et al 2021). The research contributes to the claims that the emerging adulthood population is of high risk with ED’s detected in approximately 67% of this study population (Perkiewicz et al 2021).

The signs of disordered eating include chronic weight fluctuations, rigid rituals surrounding food, frequent dieting associated with specific foods or meal skipping, feelings of guilt when eating and utilizing exercise, restriction or purging to make up for the food consumed in the diet that was considered to be “bad” (Anderson, 2018). There are also many “specialized” diets that increase risk for disordered eating behavior. One prevalent example is clean eating. Clean eating has been a population fad in the past few year that influences individuals to eat healthy by omitting certain food groups without explanation or scientific basis (Ambwani et al, 2019). This can cause a fixation or obsession with dietary intake that can lead to disordered



eating behaviors. Therefore, clean eating can transform from the solution to the problem (Ambwani et al, 2019). Whether an individual is restricting food groups, specific macronutrient or dietary intake, these behaviors lead to consequences such as a greater risk for obesity, bone loss, gastrointestinal disturbances, electrolyte imbalances, increased anxiety and depression and a diagnosis of an eating disorder (Anderson, 2018).

Previously published research has demonstrated that younger people, specifically targeting ages 18-24, are more vulnerable to health behavior influences by many individual and external factors. These individual influences (psychological drivers such as mood/emotion relating to boredom, self-regulation or control over food, food knowledge, skills and ability to cook and prepare food, food beliefs and weight control behaviors) in combination with external influences (social media, college campus, peers/family) pose a risk for negative health behaviors. Emerging adulthood is a time for transition into independence and the formation of health behavior habits that can prevent health and diet related chronic illness into adulthood. Weight perceptions based on unrealistic body ideals related to environmental influences can potentially lead to body image frustration, weight control behaviors such as cognitive restraint (CR), uncontrolled eating (UE) and emotional eating (EE) and weight fluctuations or cycling. Therefore, it is important to understand the risk associated with this population to place strategic health promotions on campus to restore positive health behaviors for eating, weight loss and body image that can be translated into adulthood.

## REFERENCES

- Adult Obesity Facts. (2020, June 29). Retrieved September 01, 2020, from <https://www.cdc.gov/obesity/data/adult.html>
- Ambwani, S., Shippe, M., Gao, Z., & Austin, S. B. (2019). Is #cleaneating a healthy or harmful dietary strategy? Perceptions of clean eating and associations with disordered eating among young adults. *Journal of Eating Disorders*, 7, 17. <https://doi.org/10.1186/s40337-019-0246-2>
- Anderson, M. (2018, October 26). *What is disordered eating?* Retrieved January 26, 2021, from <https://www.eatright.org/health/diseases-and-conditions/eating-disorders/what-is-disordered-eating>
- Aparicio-Martinez, P., Perea-Moreno, A. J., Martinez-Jimenez, M. P., Redel-Macías, M. D., Pagliari, C., & Vaquero-Abellan, M. (2019). Social media, thin-ideal, body dissatisfaction and disordered eating attitudes: an exploratory analysis. *International Journal of Environmental Research and Public Health*, 16(21), 4177. <https://doi.org/10.3390/ijerph16214177>
- Bacon, L., & Aphramor, L. (2011). Weight science: evaluating the evidence for a paradigm shift. *Nutrition Journal*, 10, 9. <https://doi.org/10.1186/1475-2891-10-9>
- Cappelleri, J., Bushmakina, A., Gerber, R. *et al.* Psychometric analysis of the three-factor eating questionnaire-r21: results from a large diverse sample of obese and non-obese participants. *Int J Obes* **33**, 611–620 (2009). <https://doi.org/10.1038/ijo.2009.74>

de Lauzon, B., Romon, M., Deschamps, V., Lafay, L., Borys, J. M., Karlsson, J., Ducimetière, P., Charles, M. A., & Fleurbaix Laventie Ville Sante Study Group (2004). The three-factor eating questionnaire-r18 is able to distinguish among different eating patterns in a general population. *The Journal of Nutrition*, *134*(9), 2372–2380.

<https://doi.org/10.1093/jn/134.9.2372>

American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders: DSM-5*. (2017).

Dennett, C. (2017, May). *Overweight/obesity: Potential perils of weight cycling - today's Dietitian Magazine*. Today's Dietitian.

<https://www.todaysdietitian.com/newarchives/0517p18.shtml>

Din, Z. U., Iqbal, K., Khan, I., Abbas, M., Ghaffar, F., Iqbal, Z., Iqbal, M., Ilyas, M., Suleman, M., & Iqbal, H. (2019). Tendency towards eating disorders and associated sex-specific risk factors among university students. *Noro Psikiyatri Arsivi*, *56*(4), 258–263.

<https://doi.org/10.29399/npa.23609>

Dulloo, A. G., & Montani, J. P. (2015). Pathways from dieting to weight regain, to obesity and to the metabolic syndrome: an overview. *Obesity reviews : an official journal of the International Association for the Study of Obesity*, *16 Suppl 1*, 1–6.

<https://doi.org/10.1111/obr.12250>

Enriquez, E., Duncan, G. E., & Schur, E. A. (2013). Age at dieting onset, body mass index, and dieting practices. A twin study. *Appetite*, *71*, 301–306.

<https://doi.org/10.1016/j.appet.2013.09.001>

- Ferraro, Z. M., Patterson, S., & Chaput, J. P. (2015). Unhealthy weight control practices: culprits and clinical recommendations. *Clinical Medicine Insights. Endocrinology and Diabetes*, 8, 7–11. <https://doi.org/10.4137/CMED.S23060>
- Grammer, A. C., Fitzsimmons-Craft, E. E., Laing, O., Pietro, B., & Wilfley, D. E. (2020). Eating disorders on college campuses in the united states: current insight on screening, prevention, and treatment. *Current Psychopharmacology*, 9(2), 91–102. <https://doi.org/10.2174/2211556009999200416153022>
- Harring, H. A., Montgomery, K., & Hardin, J. (2010). Perceptions of body weight, weight management strategies, and depressive symptoms among US college students. *Journal of American College Health : J of ACH*, 59(1), 43–50. <https://doi.org/10.1080/07448481.2010.483705>
- Lee, J., Sa, J., Chaput, J. P., Seo, D. C., & Samuel, T. (2018). Racial/ethnic differences in body weight perception among U.S. college students. *Journal of American College Health : J of ACH*, 66(5), 429–437. <https://doi.org/10.1080/07448481.2018.1446437>
- Melby, C. L., Paris, H. L., Foright, R. M., & Peth, J. (2017). Attenuating the biologic drive for weight regain following weight loss: must what goes down always go back up?. *Nutrients*, 9(5), 468. <https://doi.org/10.3390/nu9050468>
- Nelson, M. C., Story, M., Larson, N. I., Neumark-Sztainer, D., & Lytle, L. A. (2008). Emerging adulthood and college-aged youth: an overlooked age for weight-related behavior change. *Obesity (Silver Spring, Md.)*, 16(10), 2205–2211. <https://doi.org/10.1038/oby.2008.365>

NHANES 2017-2018 Questionnaire Data. (2020, August 04).

<https://www.cdc.gov/nchs/nhanes/search/datapage.aspx?Component=Questionnaire&CycleBeginYear=2017>

Purkiewicz, A., Kamelska-Sadowska, A. M., Ciborska, J., Mikulska, J., & Pietrzak-Fiećko, R.

(2021). Risk factors for eating disorders and perception of body in young adults associated with sex. *Nutrients*, *13*(8), 2819. <https://doi.org/10.3390/nu13082819>

Quaidoo, E. Y., Ohemeng, A., & Amankwah-Poku, M. (2018). Weight perceptions, weight management practices, and nutritional status of emerging adults living in the Accra Metropolis. *BMC Nutrition*, *4*, 53. <https://doi.org/10.1186/s40795-018-0265-4>

Rhee E. J. (2017). Weight cycling and its cardiometabolic impact. *Journal of Obesity & Metabolic Syndrome*, *26*(4), 237–242. <https://doi.org/10.7570/jomes.2017.26.4.237>

Schmidt, S. (2020, June 22). 2020 Diet trends & U.S consumer data on weight loss.

Retrieved January 26, 2021, from <https://blog.marketresearch.com/2020-diet-trends-u.s.-consumer-data-on-weight-loss>

Spear B. A. (2006). Does dieting increase the risk for obesity and eating disorders?. *Journal of the American Dietetic Association*, *106*(4), 523–525.

<https://doi.org/10.1016/j.jada.2006.01.013>

Stok, F. M., Renner, B., Clarys, P., Lien, N., Lakerveld, J., & Deliens, T. (2018). Understanding eating behavior during the transition from adolescence to young adulthood: a

literature review and perspective on future research directions. *Nutrients*, *10*(6), 667.

<https://doi.org/10.3390/nu10060667>

U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines for Americans, 2020-2025*. 9th Edition. December 2020. Available at [DietaryGuidelines.gov](https://www.dietaryguidelines.gov).

Viner, R., Haines, M., Taylor, S. *et al.* Body mass, weight control behaviours, weight perception and emotional well-being in a multiethnic sample of early adolescents. *Int J Obes* **30**, 1514–1521 (2006). <https://doi.org/10.1038/sj.ijo.0803352>

Wharton, C. M., Adams, T., & Hampl, J. S. (2008). Weight loss practices and body weight perceptions among US college students. *Journal of American College Health : J of ACH*, *56*(5), 579–584. <https://doi.org/10.3200/JACH.56.5.579-584>

## APPENDIX A: SURVEY

**This section is to assess Cognitive Restraint (CR), Uncontrolled Eating (UE) and Emotional Eating (EE) for disordered eating behaviors from the Three Factor Eating Questionnaire (TEFQ)**

1. I deliberately take small helpings to control my weight, CR
  - a. 1 Definitely false
  - b. 2 Mostly false
  - c. 3 Mostly True
  - d. 4 Definitely True
2. I eat when I feel anxious, EE
  - a. 1 Definitely false
  - b. 2 Mostly false
  - c. 3 Mostly True
  - d. 4 Definitely True
3. Sometimes when I start eating, I just cant seem to stop, UE
  - a. 1 Definitely false
  - b. 2 Mostly false
  - c. 3 Mostly True
  - d. 4 Definitely True
4. I have feelings of guilt after overeating, EE
  - a. 1 Definitely false
  - b. 2 Mostly false
  - c. 3 Mostly True
  - d. 4 Definitely True
5. I don't eat some foods because they make me fat, CR
  - a. 1 Definitely false
  - b. 2 Mostly false
  - c. 3 Mostly True
  - d. 4 Definitely True
6. Being with someone who is eating, often makes me want to eat, UE
  - a. 1 Definitely false
  - b. 2 Mostly false
  - c. 3 Mostly True
  - d. 4 Definitely True
7. I often get so hungry that my stomach feels like a bottomless pit, UE
  - a. 1 Definitely false
  - b. 2 Mostly false
  - c. 3 Mostly True
  - d. 4 Definitely True
8. I'm always so hungry that its hard for me to stop eating before finishing all of the food on my plate, UE
  - a. 1 Definitely false

- b. 2 Mostly false
  - c. 3 Mostly True
  - d. 4 Definitely True
9. I consciously hold back on how much I eat at meals to keep from gaining weight, CR
- a. 1 Definitely false
  - b. 2 Mostly false
  - c. 3 Mostly True
  - d. 4 Definitely True
10. I'm always hungry enough to eat at any time, UE
- a. 1 Definitely false
  - b. 2 Mostly false
  - c. 3 Mostly True
  - d. 4 Definitely True
11. How often do you avoid "stocking up" on tempting foods? , CR
- a. 1 Almost never
  - b. 2 Seldom
  - c. 3 Usually
  - d. 4 Almost always
12. How likely are you to make an effort to eat less than you want?, CR
- a. 1 Unlikely
  - b. 2 A little likely
  - c. 3 Somewhat likely
  - d. 4 Very likely
13. How often do you go on eating binges even though you're not hungry?, UE
- a. 1 never
  - b. 2, rarely
  - c. 3 sometimes
  - d. 4 at least once a week
14. How often do you feel hungry? , UE
- a. 1 Only at mealtimes
  - b. 2 Sometimes between meals
  - c. 3 Often between meals
  - d. 4 Almost always
15. On a scale from 1 to 8, where 1 means no restraint while eating and 8 means total restraint while eating, choose the number that best applies to you. CR
- a. 1 2 3 4 5 6 7 8
16. When I feel tense or stressed, I often feel I need to eat, EE
- a. 1 Definitely false
  - b. 2 Mostly false
  - c. 3 Mostly true
  - d. 4 Definitely true
17. When I feel lonely, I console myself by eating, EE
- a. 1 Definitely false
  - b. 2 Mostly false
  - c. 3 Mostly true
  - d. 4 Definitely true



18. If I feel nervous, I try to calm myself down by eating, EE
  - a. 1 Definitely false
  - b. 2 Mostly false
  - c. 3 Mostly true
  - d. 4 Definitely true
19. When I feel depressed, I want to eat, EE
  - a. 1 Definitely false
  - b. 2 Mostly false
  - c. 3 Mostly true
  - d. 4 Definitely true
20. When I feel sad, I often eat too much, EE
  - a. 1 Definitely false
  - b. 2 Mostly false
  - c. 3 Mostly true
  - d. 4 Definitely true
21. On a scale of 1 to 10, with 1= no influence to 10= very influential, how does social media influence your choices to lose weight or have the desire to be thinner?
  - a. 1 2 3 4 5 6 7 8 9 10

**This next section will assess evidence of weight cycling from 2017-2018 NHANES Survey**

**Questions under Weight History.**

22. What is your current height? (inches) 26
23. What is your current weight (pounds) 28
24. How do you consider your weight?
  - a. Underweight
  - b. About the right weight
  - c. overweight
  - d. Prefer not to answer
  - e. Don't know
25. How would you like to weigh?
  - a. More than your current weight
  - b. Less than your current weight
  - c. Stay about the same as your current weight
  - d. Prefer not to answer
  - e. Don't know
26. How much did you weigh a year ago?
  - a. \*answer\*
  - b. Prefer not to answer
  - c. Don't know
27. Was the change between your current weight and your weight a year ago, intentional?
  - a. Yes
  - b. No
  - c. Prefer not to answer

- d. Does not apply
28. In your lifetime, how many times have you lost 10 or more pounds on purpose?
- a. 0
  - b. 1
  - c. 2
  - d. 3
  - e. 4
  - f. 5+
29. Since starting college, have you tried to lose weight?
- a. Yes
  - b. No
  - c. Prefer not to answer
  - d. Don't know
30. Have your diet behaviors increased since starting college?
- a. Yes
  - b. No
  - c. Prefer not to answer
  - d. Don't know
31. If so, how did you try to lose weight (choose all that apply)
- a. Ate less
  - b. Switched to foods with lower calories
  - c. Ate less foods with fat
  - d. Exercised
  - e. Skipped meals
  - f. Ate diet foods or products
  - g. Used a liquid diet formula
  - h. Joined a weight loss program
  - i. Took prescription diet pills
  - j. Took a non-prescribed supplement to lose weight
  - k. Followed a special diet (fad diets such as keto, paleo etc)
  - l. Ate fewer carbohydrates
  - m. Ate more fruits, vegetables, salads
  - n. Ate less sugar, candy sweets
  - o. Ate less junk food or fast food
  - p. Weight loss surgery
  - q. Other

**These last questions are regarding demographic information**

32. What is your age
33. What year are you in school?
- a. Freshman
  - b. Sophomore

- c. Junior
  - d. Senior
  - e. Graduate Student
34. What is your preferred gender?
- a. Male
  - b. Female
  - c. Nonbinary
  - d. Prefer not to answer
35. What is your ethnicity?
- a. Hispanic
  - b. African American/Black
  - c. White/Non-Hispanic
  - d. American Indian
  - e. Asian
  - f. Other