INTUITIVE EATING: EXPANDING THE RESEARCH & DESCRIBING THE STATE OF PRACTICE

A dissertation submitted to Kent State University in partial fulfillment of the requirements for the degree of Doctor of Philosophy

By

Julie T. Schaefer

May, 2015
# Table of Contents

List of Tables ........................................................................................................ vi
List of Figures ........................................................................................................ vii
Abstract ................................................................................................................... viii
Chapter 1 ................................................................................................................. 1
Specific Aims ........................................................................................................... 1
Introduction ............................................................................................................. 2

*Weight-related Concerns* ......................................................................................... 2

*Prevalence of Weight-related Problems* ................................................................. 4

*Eating Disorder Behaviors & Weight Status* ......................................................... 8

*Integrating the Prevention of Obesity and Eating Disorders* ............................... 10

*Obesity & Eating Disorder Programs* ................................................................. 13

*Integrated Intervention & Prevention Programs for Weight-related Issues* ............. 15

*Intuitive Eating* .................................................................................................... 19

*Intuitive Eating Interventions* ............................................................................ 23

Chapter 2 ................................................................................................................. 27

Methods .................................................................................................................... 27

*Methods Aim 1* .................................................................................................... 27
  Study design ........................................................................................................ 27
  Intervention ......................................................................................................... 27
  Study participants and recruitment .................................................................... 28
  Instrument .......................................................................................................... 30
  Measures ........................................................................................................... 31
  Data Analysis .................................................................................................... 33
  Limitations ......................................................................................................... 35

*Methods Aim 2* .................................................................................................. 36
  Study design ........................................................................................................ 36
  Study participants ............................................................................................. 36
  Instrument .......................................................................................................... 37
  Measures ........................................................................................................... 37
  Data Analysis .................................................................................................... 38
  Limitations ......................................................................................................... 39

*Methods Aim 3* .................................................................................................. 41
  Study design ........................................................................................................ 41
List of Tables

Table 3.1. Baseline Characteristics of Participants who Completed Baseline & Post-test.................................................................................................................. 70
Table 3.2. Change in Outcome Measures by Intervention Status at Post-test....... 71
Table 3.3. Simple Linear Regression on Change in Outcomes at Post-test........... 72
Table 3.4. Simple Linear Regression on Change in Intuitive Eating Subscales at Post-test.................................................................................................................. 72
Table 3.5. Simple Linear Regression on Change in EAT-26 at Post-test............. 72
Table 3.6. Adjusted Linear Regression on Change in Outcomes at Post-test....... 73
Table 3.7. Adjusted Linear Regression on Change in Intuitive Eating Subscales at Post-test.................................................................................................................. 73
Table 3.8. Adjusted Linear Regression on Change in EAT-26 at Post-test........... 73
Table 3.9. Baseline Characteristics of Participants who Completed Baseline & Follow-up.................................................................................................................. 74
Table 3.10. Change in Outcome Measures by Intervention Status at 3-month Follow-up.................................................................................................................. 75
Table 3.11. Simple Linear Regression on Change in Outcomes at Follow-up...... 76
Table 3.12. Simple Linear Regression on Change in Intuitive Eating Subscales at Follow-up.................................................................................................................. 76
Table 3.13. Simple Linear Regression on Change in EAT-26 at Follow-up....... 76
Table 3.14. Adjusted Linear Regression on Change in Outcomes at Follow-up.... 77
Table 3.15. Adjusted Linear Regression on Change in Intuitive Eating Subscales at Follow-up.................................................................................................................. 77
Table 3.16. Adjusted Linear Regression on Change in EAT-26 at Follow-up...... 77
Table 3.17. Baseline Characteristics of Participants who Completed All 3 Time Points.................................................................................................................. 78
Table 3.18. Multivariable Linear Regression Assessing Change in Outcomes over Time.................................................................................................................. 79
Table 3.19. Multivariable Linear Regression Assessing Change in Intuitive Eating Subscales over Time................................................................. 79
Table 3.20. Multivariable Linear Regression Assessing Change in EAT-26 Total and Subscales over Time................................................................. 80
Table 4.1. Sample Characteristics.................................................................................. 97
Table 4.2. Factor Loadings Among RD/Ns who Work in Weight Management... 98
Table 4.3. Confirmatory Factor Analysis Results......................................................... 100
Table 5.1. Descriptive Characteristics of Participants................................................ 123
Table 5.2. RD/Ns’ Knowledge of Intuitive Eating....................................................... 124
Table 5.3. RD/Ns’ Attitudes Towards Intuitive Eating................................................ 125
Table 5.4. Restrictive/Traditional & Non-restrictive/Intuitive Eating Practices....... 126
Table 5.5. Average Total Scores and Correlations between Factors...................... 127
Table 5.6. Characteristics by Quartiles of Total Non-restrictive/Intuitive Eating Practices.................................................................................................................. 128
List of Figures

Figure 3.1 Change in Intuitive Eating ............................................. 81
Figure 3.2 Change in Unconditional Permission to Eat ................................ 81
Figure 3.3 Change in Eating based on Internal Cues of Hunger and Fullness..... 81
Figure 4.1 Scree Plot of Eigen Values .................................................. 101
Abstract

The traditional approach to weight management that encourages individuals to restrict calories, specific nutrients, or dietary intake is rarely effective, often results in additional weight gain, and can lead to eating disorders. Researchers have raised ethical issues with continuing to promote this approach. Support is growing for an alternative approach to address all weight- and eating-related issues. Intuitive eating is a non-diet, health-centered approach characterized by a strong connection with hunger and fullness and a healthy relationship with food and the body. The purpose of this dissertation was to expand the research and describe the state of practice regarding intuitive eating through three specific aims. The first aim was to examine the effects of an intuitive eating intervention delivered via college curriculum. Students in the course increased total intuitive eating ($p=.0036$), unconditional permission to eat ($p<.0001$), and eating based on internal cues ($p=.0175$). No changes were observed in disordered eating, body dissatisfaction, thin-ideal internalization, or physical activity. This study provides evidence that an intervention delivered via college curriculum is effective in increasing adaptive eating attitudes and behavior in young adults. The second aim was to develop and validate an instrument to measure registered dietitian/nutritionists’ (RD/Ns’) knowledge, attitudes, and practices regarding intuitive eating. An instrument was developed and distributed to a 10% random sample of all RD/Ns in the United States (U.S.). More than 22% completed the survey ($n=1,897$). Analysis revealed that instrument represented four factors: knowledge of intuitive eating, attitudes towards
intuitive eating, use of traditional/restrictive practices, and use of non-restrictive/intuitive eating practices. The survey was then distributed to the remaining 90% of RD/Ns. Nearly 25% completed the survey (n=18,622). Results confirmed the four-factor solution of the survey. The third aim was to describe the knowledge of and attitudes towards intuitive eating and use of traditional/restrictive and non-restrictive/intuitive eating practices. Results indicated that most are knowledgeable of and have positive attitudes towards intuitive eating. The use of non-restrictive/intuitive eating practices were more common than traditional/restrictive practices, providing evidence that RD/Ns are moving away from the traditional weight management paradigm and towards an intuitive eating approach.
Chapter 1

Specific Aims

The following three aims are proposed for this research:

Specific Aim #1: To determine the effects of a 16-week curriculum-based lifestyle intervention on health behavior outcomes (intuitive eating, physical activity, disordered eating, body dissatisfaction, and thin-ideal internalization) in college students.

Specific Aim #2: To develop a valid and reliable instrument to measure the knowledge, attitudes, and practices regarding intuitive eating among registered dietitian/nutritionists (RD/Ns).

Specific Aim #3: To describe the knowledge, attitudes, and professional practices regarding the intuitive eating lifestyle and describe the relationship between these factors in registered dietitian/nutritionists (RD/Ns).
Introduction

Weight-related Concerns

The majority of the population in the United States (U.S.) struggles with at least one weight-related issue, indicating a significant public health concern. These weight-related issues and disorders range from overweight and obesity to eating disorders and unhealthy weight control behaviors. Overweight and obesity are defined using body mass index (BMI), a value that describes relative weight for height, intended to estimate total body fat content. 1 BMI is calculated as weight in kilograms divided by height in meters squared. According to current guidelines, a BMI of 25.0 to 29.9 kg/m² is defined as overweight and a BMI of 30.0 or greater kg/m² is defined as obesity. Due to the high prevalence of overweight and obesity and associated co-morbidities, experts in the U.S. have been calling for the identification, evaluation, and treatment of these weight-related conditions. 1

Additionally, the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) recognizes three clinical eating disorders. First, Anorexia Nervosa (AN) is characterized by a refusal to maintain body weight at or above a minimally normal weight for age or height, intense fear of being fat or gaining weight, and disturbance in the way one’s body weight or shape is experienced. 2 Second, Bulimia Nervosa (BN) is characterized by episodes of binge eating followed by compensatory behaviors (self-induced vomiting, laxative abuse, strict dieting or fasting, excessive exercise), feeling out of control during these episodes, and placing undue influence of weight and shape on self-evaluation. 2
Third, Binge Eating Disorder (BED) is characterized by recurring episodes of binge eating, or eating significantly more food in a shorter period of time than most people would eat, and feeling out of control during these episodes. Furthermore, the DSM-V recognizes a fourth diagnostic category, eating disorders not otherwise specified (EDNOS), for those who require clinical treatment but do not meet the specific criteria for the first three. Several diagnoses of EDNOS are characterized by sub-threshold eating disorder behaviors, in which an individual exhibits one or more of the symptoms of an eating disorder at a sub-threshold level.

Researchers have also identified a series of abnormal eating and weight control practices that are of public health interest, but do not classify as clinical eating disorders. These behaviors are known as unhealthy or extreme weight control behaviors. Unhealthy weight control behaviors include fasting, eating very little food, using a food substitute, skipping meals, or smoking cigarettes in order to lose weight or to keep from gaining weight. Extreme weight control behaviors include taking diet pills, engaging in self-induced vomiting, and misusing laxatives or diuretics in order to lose weight or keep from gaining weight. The evidence regarding the whole spectrum of weight-related disorders demonstrates that these problems are prevalent among individuals in the U.S., can occur simultaneously, and need a new, effective approach to prevention and intervention.
Prevalence of Weight-related Problems

The majority of all U.S. adults, roughly 68.8%, are considered overweight or obese. 4 While the rates do not differ significantly between men and women overall, there are disparities among minority women. 4 For example, 32.2% of non-Hispanic white women are obese while 41.4% of Hispanic women, 44.9% of Mexican American women, and 58.5% of non-Hispanic black women are obese. 4 Trend analysis does demonstrate that the rate of increase has slowed, 4 but the prevalence of overweight and obesity remains high in the U.S. at all ages. According to the spring 2013 American College Health Association-National College Health Assessment II (ACHA-NCHA II) survey of more than 96,000 college students at 153 institutions reported nearly 34% prevalence of overweight or obesity. 5 A nationally representative survey of U.S. high school students reveals that 13% are considered obese and 15.2% are considered overweight. 6 Similarly, nearly 32% of all U.S. children and adolescents are considered overweight or obese. 7

In comparison, clinical eating disorders affect a small percentage of individuals. Among U.S. adults, the lifetime prevalence of AN is 0.6%, of BN is 1.0%, and of BED is 2.8%. 8 An additional 1.2% of the adult population suffers from sub-threshold BED 8 and nearly 5% of the adult population suffers from EDNOS according to the diagnostic criteria of the fourth edition of the DSM. 9 Among U.S. adolescents, 0.3%, 0.9%, and 1.6% suffer from the same disorders, respectively. 10 Estimates report an additional 0.8% and 2.5% of adolescents suffer from sub-threshold levels of AN and BED. 10 The age of onset of these eating disorders is between 12 and 13 years of age, 10 markedly younger than previously reported average age of onset estimated at 18 to 25 years of age. 8 Similar
to the adult population, about 5% of U.S. adolescents suffer from EDNOS according to the diagnostic criteria of the fourth edition of the DSM. 9 Not all individuals with eating disorders are referred to mental health care or are hospitalized; therefore, even those with the most accurate medical record data underestimate true incidence and prevalence in the community. 11

Over the last decade, there has been an increase in eating disorder diagnoses. 12 Hospital discharges with a primary or secondary diagnosis of an eating disorder have increased by 24% from 1999-2000 to 2008-2009. 12 Of inpatient eating disorder diagnoses in 2008-2009, 88% were in females, representing a 21% increase from 1999-2000. 12 During this same time, there was a 53% increase in hospitalizations for males. 12

While clinical eating disorders are relatively rare, the prevalence of unhealthy weight control behaviors is common, especially among youth and adolescents. National estimates reveal that 61.2% of high school girls and 31.6% of high school boys are currently trying to lose weight. 6 In order to lose weight or keep from gaining weight, 12.2% have gone at least 24 hours without eating, 5.1% have taken diet pills, powders, or liquids, and 4.3% have vomited or taken laxatives. 6

A large cohort study of teens in the Midwestern U.S. reveals that over 56% regularly carried out unhealthy weight control behaviors. 13 In this same population, 10.5% reported regular binge eating and 22.1% engaged in what the researchers classified as extreme weight control behaviors. 14 More than 9% of the girls and 13% of the boys in the study reported recurrent purging behaviors such as self-induced vomiting, laxative use, or excessive exercise. 15 Among very overweight adolescent girls, 76.0% reported
unhealthy weight control behaviors and 17.9% reported extreme weight control behaviors. Prevalence of unhealthy and extreme weight control behaviors increases significantly from young to middle adolescence and extreme weight control behaviors increase even more steeply from middle to late adolescence, leading into the college years.

Unhealthy weight control behaviors are also common among college students. According to the ACHA-NCHA II, 36% of college males and 61% of college females are currently trying to lose weight. Furthermore, participating students report various unhealthy weight control behaviors in an attempt to lose weight. In the past 30 days, 29% of males and 47% of females have dieted, 1% of males and 4% of females have vomited or taken laxatives, 2% of males and 5% of females have taken diet pills. Another study of college women from six universities across the U.S. found that 15% of participating women and 4% of participating men had purged at least once. Quick & Byrd-Brenbenner’s study in three large U.S. public universities found that one-quarter of female respondents and one-fifth of male respondents reported fasting for at least eight hours to control their weight in the past 28 days. Further, about one in seven students reported regular occurrence of binge eating and several reported inappropriate compensatory behaviors in the past 28 days; 6% used self-induced vomiting, 6% misused medicine, and nearly one-third reported excessive exercise.

In an attempt to characterize eating disorder behavior norms among college students, research has demonstrated that among women asked to characterize behavior in the past four weeks, 21.3% reported at least one objective binge eating episode, 32.1%
reported at least one subjective binge eating episode, 8.8% reported at least one occurrence of self-induced vomiting, 8.3% reported at least one episode of laxative misuse, 6.6% reported at least one episode of diuretic misuse, 30.8% reported at least one episode of excessive exercise, and 25.9% reported at least one episode of dietary restraint.  

Regular performance of these behaviors over the past four weeks included 6.4% of women who reported objective binge eating episodes, 16.7% who reported subjective binge eating episodes, 4.0% who reported self-induced vomiting, 3.1% who reported laxative misuse, 3.6% who reported diuretic misuse, 5.9% who reported excessive exercise, and 8.4% who reported dietary restraint.  

Normative data among college men asked to describe their behaviors over demonstrates that 25.0% reported at least one objective binge eating episode, 3.2% reported at least one occurrence of self-induced vomiting, 2.7% reported at least one episode of laxative misuse, 31.4% reported at least one episode of excessive exercise, and 24.0% reported at least one episode of dietary restraint.  

Regular performance of these behaviors among college men in the past four weeks included 7.9% who reported objective binge eating episodes, 1.2% who reported self-induced vomiting, 0.25% who reported laxative misuse, 4.5% who reported excessive exercise, and 5.0% who reported dietary restraint.  

These findings suggest that men and women do not differ in the proportion of those that report at least one objective binge eating episode, at least one occurrence of excessive exercise, or at least one episode of dietary restraint.  

Men, however, exhibited significantly lower rates of at least one occurrence of self-induced vomiting and laxative misuse.
Fewer studies have examined unhealthy weight control behaviors in middle aged adults. Researchers have observed in a representative community-based sample of people over fifteen years of age in Australia, that while strict dieting or fasting was more common in younger groups, regular purging was most common in women 35-44 years of age. In a cohort of Canadian women 20-40 years of age, 4.1% reported regular binging, 1.1% reported regular purging, and 18.2% reported other methods of compensation. In a large sample of American women 25-45 years of age, an alarming 31.1% engaged in extreme weight loss or purging behaviors. Specifically, 7.1% used vomiting, 9.0% used laxatives, 11.6% used diuretics, 17.9% used dietary restriction, 20.5% used excessive exercise, and more than 40% used diet pills. In another study among women between 60 and 70 years of age, 3.8% met criteria for a clinical eating disorder while an additional 4.4% reported disordered eating. These studies suggest that many individuals of all ages struggle with at least one issue on the spectrum of weight-related disorders. Moreover, there is evidence that the weight-related problems discussed may not be mutually exclusive.

_Eating Disorder Behaviors & Weight Status_

While being underweight is characteristic of AN, more than 30% of adults diagnosed with BN and 42% of adults diagnosed with BED are obese, demonstrating that overweight and eating disorders can occur simultaneously. Similarly, 35.1% of girls with BED, 18.9% of girls with BN, and 25.1% of girls with EDNOS are overweight or obese. At the sub-clinical level, overweight individuals are at higher risk for engaging
in eating disorder behaviors than their normal weight counterparts. One state-wide study involving adolescents in Connecticut found that girls with the highest BMI were more likely to engage in dieting and eating disorder behaviors, including vomiting, taking diet pills, and misusing laxatives and diuretics. 26 Boutelle and colleagues 27 also found that the use of unhealthy weight control behaviors is directly related to overweight status in both male and female adolescents, with prevalence of these behaviors increasing with each BMI category. In fact, BMI predicts prevalence of unhealthy weight control behaviors in adolescence 3,28-31 and in girls as young as nine years old.28,30

Neumark-Sztainer and colleagues 14 investigated the co-occurrence of overweight, binge eating, and extreme weight control behaviors, including use of laxatives, diet pills, self-induced vomiting, and/or diuretics, among adolescents. The researchers found that 23.5% of overweight adolescent girls engage in extreme weight control behaviors and an additional 10% engage in both binge eating and extreme weight control behaviors. 14 Among overweight adolescent boys, 12.3% report the use of extreme weight control behaviors and only an additional 1.9% engages in both binge eating and extreme weight control behaviors. 14

Likewise, longitudinal studies reveal that engaging in unhealthy weight control behaviors can lead to weight gain. For example, adolescent girls with BED are almost twice as likely as girls without an eating disorder to become overweight or obese. 25 There is evidence that dieting and disordered eating are associated with weight gain 32,33 or onset of obesity 34 in adolescents. One cohort study that followed adolescents for ten years found that those who engaged in dieting and unhealthy weight control behaviors
increased their BMI significantly more than their non-dieting counterparts. While persistent use of dieting and unhealthy weight control behaviors predicted larger increases in BMI, dieting at even just one time point predicted greater weight gain than those who never dieted.

More than three decades ago, Cannon & Einzig published a book titled *Dieting Makes You Fat*. Today, research continues to confirm this declaration; several studies have shown that dieting leads to increased body fat in children and weight gain in adolescents, college freshmen, and adults. Dieting also predicts an increase in BMI among women in one study that followed adolescents through young adulthood and in both women and men in another study that followed adolescents through middle adulthood. A large cohort study that followed twins beginning at age 16 for ten years found that intentional weight loss episodes are associated with weight gain and risk of overweight, suggesting that dieting, independent of genetic factors, can lead to weight gain. Traditionally, obesity and eating disorders are regarded as separate problems with distinct origins and approaches to prevention and treatment. Due to the evidence suggesting that these issues can occur simultaneously, researchers have begun to question whether more progress can be made in the prevention and treatment of weight-related disorders by approaching all weight-related conditions simultaneously.

*Integrating the Prevention of Obesity and Eating Disorders*

In addition to the co-occurrence of overweight/obesity and eating disorder behaviors, researchers have identified several reasons for integrating the previously
discrete fields. One important reason the two fields should be integrated is that the foci of the two separate programs fundamentally contradict each other. 44,45 Obesity programs foster dissatisfaction with body weight and encourage overweight individuals to monitor and restrict intake with the goal of reducing body weight. 44,45 On the other hand, eating disorder programs promote self-acceptance of the body at any weight and discourage individuals from monitoring and restricting their intake to reduce preoccupation with food and unhealthy weight control behaviors. 44,45 Since the evidence shows that obesity and eating disorder behaviors can occur simultaneously, 3,8,14,26,29-31,41 the contradictory messages need to be resolved if clinicians and researchers intend to make progress in these fields.

In addition, there is evidence that all weight-related problems share several personal, socioenvironmental, and behavioral risk factors. First, there are several personal shared risk factors. Haines & Neumark-Sztainer 43 suggest that body dissatisfaction can lead to dieting and negative affect, which can lead to binge eating, contributing to obesity. Body dissatisfaction can also lead to avoidance of physical activity which can contribute to obesity. 43 Body dissatisfaction can directly lead to eating disorders, or indirectly lead to eating disorders by leading to dieting and/or negative affect. 43 Others have suggested similar factors, weight concern 14,46 and weight preoccupation. 45 Self-esteem is also relevant to all weight-related issues. 43,45

Next, there are several socioenvironmental factors that affect both disordered eating and obesity. Media use is a shared risk factor among various weight-related problems. 14,43,45 Haines & Neumark-Sztainer 43 suggest that television viewing is
associated with increased dietary intake both during viewing and as a result of advertising and is also associated with decreased physical activity, both contributing to obesity. Likewise, the media promotes a thin-ideal female body and a muscular ideal male body. Internalization of these ideal body types can lead to body dissatisfaction which can lead to dieting and disordered eating and/or other psychological disturbance, both of which can lead to eating disorders. Similarly, Haines and colleagues found that desire to look like same-sex media figures predicts weight-related problems. In addition, Neumark-Sztainer and colleagues found that exposure to magazine articles on weight loss predicted weight-related problems.

Another socioenvironmental risk factor is weight-related teasing. Weight-related teasing has been linked to psychological distress, body dissatisfaction, and dieting, all of which can lead to binge eating, contributing to obesity. Weight-related teasing can directly lead to dieting and disordered eating, or indirectly lead to dieting and disordered eating through body dissatisfaction, leading to eating disorders. Further, parental weight concern and weight behaviors and parental weight teasing can predict weight-related problems. There is also evidence that family meal frequency is inversely associated with weight-related problems.

Finally, behavioral factors have been identified that can lead to both obesity and disordered eating. One such factor is dieting. Dieting can lead to binge eating, decreased metabolic rate, and decrease in sustainable dietary and physical activity practices, all of which can lead to obesity. Likewise, dieting can lead to unhealthy weight control behaviors, sub-threshold eating disorders, and clinical eating disorders.
In fact, dieting has been identified as the most important predictor of the development of eating disorders in adolescents; female adolescents identified as severe dieters are 18 times more likely and moderate dieters are five times more likely to develop an eating disorder than their non-dieting counterparts.\textsuperscript{50} Engaging in unhealthy weight control behaviors is also a risk factor for both obesity and eating disorders.\textsuperscript{14,44,45} Prevention and intervention programs that address these common risk factors may be more effective than existing programs that address either overweight and obesity or eating disorder behavior exclusively.

\textit{Obesity & Eating Disorder Programs}

In their current form, as discrete fields, interventions for obesity management and eating disorders have limited effectiveness. The traditional approach to treat obesity is to teach individuals to monitor and restrict intake of calories or particular nutrients to induce weight loss. This approach, however, has had little long-term success. These programs have high attrition rates; participants rarely maintain weight loss and sometimes gain back even more weight than lost during the program.\textsuperscript{51-55} In fact, recently, advice on low-fat diets to treat obesity has been withdrawn.\textsuperscript{56} There is evidence that frequency of dieting, or intentionally placing restriction on one’s intake, is directly associated with weight gain.\textsuperscript{33,40,57,58} In addition, dieting is a well-established risk factor for unhealthy weight control behaviors, binge eating and bulimic pathology, and eating disorders\textsuperscript{33,59} and negative psychological attributes such as body dissatisfaction, depression, lower self-esteem,\textsuperscript{15,60} and negative affect.\textsuperscript{61}
Due to the limited effectiveness of intervention programs, several researchers have investigated the prevention of obesity and/or weight gain. Systematic reviews of obesity prevention programs in adults reveal that about half of prevention programs produce positive results, but that this conclusion was based only on a small number of studies.\(^62,63\) More studies have been conducted in youth, especially school age children. The Cochrane Collaboration meta-analysis found strong evidence to support the effectiveness of childhood obesity prevention programs, with greater effects seen in younger age groups.\(^64\) These results are limited by weak study designs, a lack of process evaluation, and inadequate investigation of iatrogenic effects.\(^64\)

Likewise, treatment for clinical eating disorders is modestly successful at best. There is longitudinal evidence that less than half of individuals with AN fully recover, 20-30\% experience returning symptoms, and 5-10\% eventually die from conditions caused by the eating disorder.\(^65\) In fact, AN has the highest mortality rate of any psychiatric disorder.\(^66\) Longitudinal evidence suggests that over the course of five years, 15\% of young women with BN still meet diagnostic criteria while an additional 36\% progressed to a different eating disorder.\(^67\) Those with BED had a better outlook; 18\% still met diagnostic criteria for an eating disorder after five years.\(^67\) About 41\% of those diagnosed with BN and 77\% of those diagnosed with BED reported the use of no unhealthy weight control behaviors after five years.\(^67\) Fairburn and colleagues\(^67\) note that these statistics may appear more favorable than they are because women with more severe symptoms at baseline were less likely to participate in long-term follow-up. Keski-Rahkonen and colleagues\(^68\) estimate the clinical recovery rate of BN to be around 55\%.
Furthermore, less than one-third of those who meet criteria for BN \(^67,68\) and only about 3% of those who meet criteria for BED \(^67\) actually sought professional treatment. For this and other practical reasons, many studies have investigated the prevention of AN and other eating disorders.

Meta-analysis reveals that eating disorder prevention programs have only a small net effect on changing maladaptive behaviors and attitudes. \(^69\) A review of studies among 8-12 year old children concluded that there is limited evidence that programs can reduce or prevent eating disorder behaviors \(^70\) and a review by the Cochrane Collaboration declared that no conclusions can be made about the effectiveness of eating disorder prevention programs in children and adolescents. \(^71\) Another meta-analysis revealed that about half of eating disorder prevention programs reduce eating disorder risk factors and less than one-third reduce current or future eating disorder behaviors. \(^72\) There is evidence that prevention programs that target high risk populations are more effective. \(^69,72,73\) Since programs that address obesity and eating disorders separately have achieved little success, researchers have begun to investigate the impact of interventions that integrate the two fields.

*Integrated Intervention & Prevention Programs for Weight-related Issues*

By focusing on the previously discussed shared risk factors, a small number of studies have explicitly attempted to address the whole spectrum of weight-related issues. Austin and colleagues \(^74\) investigated the effect of a theory-based obesity prevention program in sixth and seventh grade students on extreme weight control behaviors. By
addressing several shared risk factors, the prevalence of obesity was significantly reduced in girls; furthermore, girls in the intervention program were also less than half as likely to report self-induced vomiting, misuse of laxatives, and use of diet pills at a 21-month follow-up. In a similar program, these behaviors were reduced by two-thirds for girls in intervention schools. Neumark-Sztainer and colleagues evaluated another program designed to prevent weight-related problems among high school girls. Results indicate that the program decreased unhealthy weight control behaviors and improved body image, but there was no change in body fat or BMI at nine month follow-up.

Stock and colleagues evaluated a prevention program intended to address both obesity and eating disorders in which students in fourth through seventh grade served as peer leaders to kindergarten through third grade children. Students in both roles improved aspects of health knowledge and behavior, but no effects were observed for body image satisfaction or eating disorder behavior. Haines and colleagues investigated a program that intended to reduce weight-related teasing specifically in fourth through sixth grade students. Results indicate that the percentage of students reporting appearance and weight-related teasing significantly decreased in the intervention schools.

A series of studies has been conducted to investigate the outcomes of a dissonance-based intervention to address shared risk factors, such as thin-ideal internalization, body dissatisfaction, negative affect, and eating disorder symptoms in high school and college women. Initial results were successful in improving all outcomes. When replicated, this program was more successful in reducing these factors than a healthy weight control intervention, a waitlist control condition, and an
expressive writing control condition. Participants in the dissonance-based intervention and the healthy weight control intervention were both at lower risk for onset of obesity while the healthy weight control intervention was at the lowest risk for onset of eating disorder symptoms. At a three-year follow-up, both the dissonance-based and healthy weight intervention sustained positive effects in both eating disorder behavior and weight gain. Future research should be conducted to determine whether dissonance-based and more traditional approaches to weight management should be integrated to produce stronger effects.

Stice & Ragan took an innovative approach to reduce shared risk factors by offering an intervention through an elective college course. Since middle and high schools have limited time and resources to devote to such programs, a college course could allow for greater intensity while addressing a high risk population. Students who enrolled in the course attended class twice a week for one and a half hours at a time, for 15 weeks. The course involved didactic presentations, group discussion, and a guest speaker; students were required to complete essays, give a presentation, and write a ten page paper. Those who participated in the course reduced thin-ideal internalization, body dissatisfaction, dieting, and eating disorder behaviors. Intervention students also significantly decreased BMI while control students significantly increased BMI during the study period. Notably, those with the highest baseline BMI experienced the greatest weight loss. This trial was limited, however, in that it had a small sample size (n=17) in the intervention, included only females, and did not conduct a follow-up.
When the study was replicated, intervention students experienced significant reduction in thin-ideal internalization, body dissatisfaction, dieting, and eating disorder behaviors. Furthermore, the comparison group experienced significantly greater increases in BMI than the intervention participants. All effects were sustained at a six month follow-up. This study also had a small sample size (n=25) in the intervention and included only females.

Two other studies have conducted interventions through a college curriculum approach. Springer and colleagues found that a college course can decrease frequency and severity of body dissatisfaction and eating disorder behavior, but found no change in BMI. This study, however, had no comparison group, included a small sample (n=24) of women only, and conducted no follow-up. Hawks and colleagues found that a similar approach decreased dieting and increased body satisfaction. Similar to the others, results are limited by a small sample size (n=29) of women with no comparison group or follow-up. This study, however, is unique in that it not only reduced risk factors, but promoted an adaptive style of eating, known as intuitive eating.

Researchers have noted that the abundant literature on eating behavior has been vastly dominated by a focus on pathology. Intervention efforts have intended to reduce risk factors for developing body dissatisfaction, unhealthy weight control behaviors, and eating disorders. Tylka has argued that an absence of these behaviors and attitudes may not necessarily be the equivalent of adaptive eating behavior. Investigators in the field are calling for research on positive body image and adaptive
eating habits. 89-92 As a result, much attention has been brought to a health-centered non-diet approach, commonly referred to as intuitive eating. 93

Intuitive Eating

Intuitive eating is an adaptive style of eating marked by a strong connection with internal physiological cues to eat and a healthy relationship with food. The concept of intuitive eating originated in the late 1990s when two registered dietitian/nutritionists (RD/Ns) grew frustrated watching overweight clients lose weight on calorie-restricted diets only to gain the weight back, and clients with eating disorders on calorie-dense diets resort back to eating disorder behaviors after achieving a healthy weight. 93 Through experience, the nutrition counselors claim to have found great success for both overweight and eating disorder when training clients in adapting the intuitive eating lifestyle. 93

Researchers have identified four central features of intuitive eating: unconditional permission to eat, eating for physical rather than emotional reasons, reliance on internal hunger and satiety cues, and body-food choice congruence. 91,93,94 Unconditional permission to eat refers to willingness to eat whenever the body indicates hunger and to not avoid foods deemed “bad” or “unhealthy.” 91,93 Eating for physical rather than emotional reasons reflects the instinct to use food to satisfy a physical need and not to cope with emotional fluctuation or distress. 91,93 In fact, intuitive eating is positively related to proactive coping skills, indicating that intuitive eaters are less likely to use food to cope with emotions. 91,93 Reliance on internal hunger and satiety cues refers to the
ability to let physiological hunger cues initiate eating and physiological fullness and satiety cues dictate when to stop. Body-food choice congruence reflects the tendency to choose foods that honor health and body functioning (i.e. foods that are nourishing and promote energy) while still choosing foods that are palatable.

The ability to eat intuitively is thought to be inborn. Whether a person continues this eating style or not is largely dependent on his or her environment. Infants begin to develop food preferences and eating habits immediately after birth when a mother decides to breastfeed or formula feed. While infants that consume their mother’s milk are exposed to a variety of flavors from their mother’s diet, infants that consume formula are exposed to only one flavor. As a result, breastfed infants may have greater acceptance of solid foods than formula fed infants. The development of eating behavior is complex and involves many other factors, such as modeling, television and advertising, and parental encouragement or restriction. If a caregiver creates an environment that lacks acceptance, has strict food rules, or pressures children into eating, children may not learn to follow their internal cues of hunger and satiety. When given the opportunity to dictate their intake, infants and children are capable of regulating their caloric intake by following internal cues. Parental control and other factors, however, can override these instincts, thus decreasing sensitivity to internal cues. Eneli, Crum, and Tylka assert that caregivers interfere with development of children’s trust in hunger, appetite, and satiety cues when they misinterpret the definition of normal weight, restrict intake, pressure the child to eat when he or she refuses, and use food as a calming agent.
Higher levels of intuitive eating are associated with a lower Body Mass Index (BMI). As opposed to those identified as low intuitive eaters, high intuitive eaters have significantly higher high density lipoprotein (HDL) levels, but do not differ significantly in glucose, total cholesterol, low density lipoproteins (LDL), or body fat. In addition, there is a strong inverse relationship between intuitive eating and eating disorder symptomatology, body dissatisfaction, pressure for thinness, thin-ideal internalization, body surveillance, body shame, and poor interoceptive awareness. Intuitive eating is also associated with psychological well-being, as demonstrated by optimism, proactive coping, body appreciation, self-esteem, and overall life satisfaction.

In a large cohort study of teens and young adults, those who report trusting their bodies to tell them how to eat were less likely to exhibit disordered eating habits and chronic dieting. In particular, two distinct components of intuitive eating, eating for physical rather than emotional reasons and reliance on internal hunger/satiety cues, uniquely contribute to psychological well-being and account for more variance in psychological measures than low eating disorder symptomology alone. This evidence supports the notion that intuitive eating is not simply a lack of eating disorder symptomology, but is a positive and adaptive eating style.

Avalos and Tylka integrated relevant literature to develop a model to understand the constructs that may predict intuitive eating in women. The first construct is general unconditional acceptance of body shape and size by an influential person during childhood. If a woman perceives such acceptance, she is likely to perceive that
others also accept her body and in turn, is less likely to be preoccupied with altering outside appearance. Subsequently, these women are more likely to focus on how their bodies function and feel. Greater body acceptance also promotes positive feelings, respect, and appreciation toward one’s body. Focusing on how one feels internally rather than how one looks externally is also likely to foster greater body appreciation. A woman who has a strong connection to her body function is also more likely to eat according to internal signals of hunger and fullness rather than external cues such as a diet plan or time of day. Finally, body appreciation allows one to connect with and abide by bodily signals and needs, aligning with intuitive eating. Originally, this model was empirically supported by two cohorts of college women. Recently, this model has also been found to apply to women in emerging, early, and middle adulthood.

Another style of eating that shares many of the same concepts as intuitive eating is mindful eating. Mindful eating has been described as the nonjudgmental awareness of the physical and emotional sensations associated with eating or environment. Similar to intuitive eating, this approach encourages individuals to eat according to internal cues of hunger and satiety and recognize but not respond to external cues such as advertisement or emotions. Mindful eating also emphasizes eating slowly and tasting every bite thoroughly, without distraction. Mindfulness-based eating programs also incorporate meditation to bring relaxation to food and other anxieties and increase awareness, of internal experiences and emotions. Tribole and Resch explain that while mindful eating is not the same as intuitive eating, mindful eating is part of intuitive
Mindful eating, or conscious eating, is essential to recognizing and responding to internal cues of satiety and fullness.  

**Intuitive Eating Interventions**

Researchers have been implementing intuitive eating into weight management interventions for over two decades. In general, interventions help participants lose or maintain body weight. Results regarding markers of cardiovascular risk are inconsistent, but there is evidence that adopting or transitioning to the intuitive eating lifestyle can decrease total and low density lipoprotein (LDL) cholesterol, increase high density lipoprotein (HDL) cholesterol and cardiorespiratory fitness, and improve blood pressure while others observed no improvements in cardiovascular risk.

Intuitive eating interventions also decrease disordered eating behaviors and attitudes. Most participants decrease dietary restraint or restrictive dieting. Several studies also show an increase in interoceptive awareness, the ability to recognize and respond to internal states such as emotions, hunger, and satiety. Still others demonstrate decrease in eating disorder symptomatology such as disinhibition, the loss of control that follows self-imposed rules, binge eating, and signs and symptoms of anorexia nervosa.

In programs that addressed and encouraged body satisfaction and appreciation, participants had improved self-acceptance, decreased body image avoidance, improved body satisfaction, decreased body preoccupation, decreased
drive for thinness, 119,120,122,124,131 and decreased negative self-talk. 121 Intuitive eating interventions have also resulted in improvement of other aspects of psychological well-being. Several studies demonstrated improved depression, 112,113,115,119,120,122-124,131,133,134 negative affect, 112 feelings of ineffectiveness, 124 and anxiety. 123,131,133,134 Furthermore, interventions increased self-esteem, 113,118-120,122,124,125,128-130 quality of life, 113 interpersonal sensitivity, 123 and general well-being. 127 Overall, weight management interventions that encourage intuitive eating demonstrate positive physiological, behavioral, and psychological outcomes, but several limitations exist. 136

One limitation is that none of the studies above actually measured intuitive eating behavior. Two validated intuitive eating surveys exist, 91,137 one of which was recently updated. 94 Although half of these studies were published after these scales were developed, it is possible that several began before they were available. Many studies used proxy measures such as increased interoceptive awareness, the ability to recognize and respond to internal states, 119,120,122,124 or decreased dietary restraint. 114,115,119,120,122,130 However, as Tylka 91 asserts, a decrease in maladaptive behavior does not necessarily equate to adaptive behavior. In addition, only two studies included men. 111,125 Three others were open to men, although none participated. 115,118,134 Research is needed to investigate intuitive eating in men, especially since there is evidence that men may respond better to an intuitive eating approach. 133,138

Intuitive eating interventions have also shown positive results in women diagnosed with BED. 110,139-142 Treatment that included raising awareness to hunger and satiety cues helped women with BED decrease number of binges per week, depression,
and anxiety and increase sense of eating control, mindfulness, and hunger and satiety awareness. Craighead & Allen developed an Appetite Awareness Training program to help patients with BED relearn to recognize and respond to internal sensations of hunger and fullness. This approach has been successful in the evaluation of case studies. In college women with BED, the Appetite Awareness Training program helped the participants decrease overeating, binge eating, urge to eat for several emotional and situational cues, depression, and fear of negative evaluation and increase self-esteem.  

Another mindful eating program was designed to complement BED treatment incorporated mindfulness, explored the myths of dieting, and encouraged participants to eat based on internal cues. A pilot study demonstrated that this program can decrease disordered eating attitudes and behaviors and desire to be thin. Positive results in both obese and eating disorder participants warrant an investigation into whether intuitive eating can be used as an integrated program to address the whole spectrum of weight-related disorders.

Finally, it is unknown to what degree intuitive eating is applied in practice outside of academia. Even though intuitive eating was founded by two RD/Ns, education and training in intuitive eating is not required on the career path to become an RD/N and therefore it is not known if RD/Ns have the knowledge of intuitive eating to apply it in practice or whether they support intuitive eating as an approach towards healthy behaviors. To date, there has been no investigation into the knowledge, attitudes, and practices of RD/Ns regarding intuitive eating.
In conclusion, weight-related issues and disorders affect many people in the population with limited evidence of effective approaches to prevention and treatment. Thus, the purpose of this research is to investigate the effects of an innovative intervention that uses intuitive eating to address the whole spectrum of weight-related issues. Additionally, this research will further our understanding of the clinical knowledge, attitudes, and practices regarding intuitive eating in nutrition professionals.
Chapter 2

Methods

Methods Aim 1

Study design

The purpose of aim 1 was to determine the effects of a 16-week curriculum-based lifestyle intervention on intuitive eating, disordered eating, body dissatisfaction, thin-ideal internalization, and physical activity in college students. Aim 1 was addressed using a quasi-experimental design with longitudinal data collection. The conceptual model for this study can be found in Appendix A. This research was reviewed and approved by the Kent State University Institutional Review Board (IRB).

Intervention

The intervention was conducted through the course “Dieting, Body Image, and Healthy Weight in College,” which was offered at Kent State University through the College of Public Health in the fall of 2013 (cohort 1) and in the spring of 2014 (cohort 2). Each semester, there was one section of the course offered online and one section of the course offered in-class for a total of four sections.

The course covered topics such as basic nutrition, implications of dieting, principles of intuitive eating, issues regarding body image in our society, and the public health impact of obesity and eating disorders. Students were required to attend class
lectures, complete assigned readings, and participate in class discussion and activities. Homework assignments and class activities utilized behavior change strategies to assist students in examining their current relationship with food and practice the principles of intuitive eating. Such strategies included psycho-education, self-monitoring, Health Belief Model, cognitive behavior therapy, cognitive dissonance, media literacy, role play, goal setting, and self-efficacy. A description of activities, strategies, and outcomes intended to be impacted can be found in Appendix B. The course syllabus and schedule can be found in Appendix C.

Study participants and recruitment

The study participants for the intervention group were students who registered for the course “Dieting, Body Image, and Healthy Weight in College.” All undergraduate students on campus were eligible to register for the course. Each cohort met for 16 weeks. All students who enrolled in the course were eligible to participate in the study. Any student who added the course after the first class session was added to the e-mail distribution list and included in analyses. The university had a two-week add/drop period, in which students can add and drop classes at will during this time. Any student who dropped the course after completing the baseline survey was excluded from analysis. All participants had until the end of the second week of class to participate in the baseline survey to maximize time for response before any material relevant to the intervention was presented. All students who completed the baseline survey and either or both the post-test and the follow-up surveys was included the data analysis.
Students enrolled in a basic nutrition course, “Science of Human Nutrition,” were recruited to serve as the comparison group. This course educated students on basic human nutrition, covering mostly traditional topics including energy balance, weight control, nutrient needs, diet selection, nutrition metabolism, and nutrition-related diseases. Students were recruited from the online and in-class sections during both semesters. Any student enrolled in “Science of Human Nutrition” during the second semester who completed the intervention course in cohort 1 was excluded from the second cohort of the comparison group.

To recruit participants, a flyer advertising the course was e-mailed to public health, nutrition, and exercise science students. Flyers were also distributed to the campus group the Body Acceptance Movement, through the Office of Health Promotion, through the College of Public Health. Finally, flyers were posted in the dorms on campus.

The instructor explained the research project to the students on the first day of class and explained that they will receive an e-mail with a link to the survey. Participation in the research was completely voluntary, not associated with their grade in the course in any way, and the instructor did not know who participates. Students who agreed to participate were asked to follow the link provided in the e-mail. A website opened to the consent page. Students were prompted to read the consent and at the bottom of the page and select that they agree or do not agree to participate. If students agreed to participate, the survey began. If they did not agree to participate, a page appeared thanking them for their consideration and assured them that their decision was not be associated with their
grade in the course in any way. Students were able to withdraw from the study at any time.

The researcher also visited multiple sections of “Science of Human Nutrition” to recruit participants for the comparison group on the first day of class and explained the research study, asked for participation, assured the students that it is voluntary, and was not associated with their grade in the course in any way. An e-mail was sent to these sections containing a link to the survey and the same procedure would be followed as described above.

Students in cohort 1 received one $10 iTunes gift card for completing both the baseline and post-test survey. After the cohort 1 post-test survey, to increase participation and decrease attrition, all participants were mailed a $5 gift card after each survey completed.

Instrument

The research survey was administered via e-mail to both groups at three time points: in the first two weeks of class (baseline), after the last class (post-test), and three months following the end of the semester (follow-up). The survey instrument can be found in Appendix D. All surveys was administered online through Qualtrics survey software.
Measures

Exposure. Students enrolled in the “Dieting, Body Image, and Healthy Weight in College” course were classified as the intervention group. Students enrolled in “Science of Human Nutrition” were classified as the comparison group.

Outcomes. Intuitive eating attitudes and behavior were assessed using the Intuitive Eating Survey-2 (IES-2). The IES-2 measured overall level of intuitive eating as well as four subscales: unconditional permission to eat; eating for physical rather than emotional reasons; reliance on hunger and satiety cues; and body-food congruence. Each of the 23 items was rated on a Likert scale (1 = strongly disagree to 5 = strongly agree). This tool has been validated in college women and men. Cronbach’s alphas for each subscale ranged from 0.77 to 0.92.

Eating disorder attitudes and behaviors were assessed using the Eating Attitudes Test (EAT-26). The EAT-26 is a widely used measure of symptoms and concerns that are characteristic of eating disorders. The EAT-26 has a composite score to measure overall eating disorder attitudes and behavior and three subscales to measure specific domains of eating disorder attitudes and behavior: dieting, bulimia & food preoccupation, and oral control. The first 26 items were rated on a Likert scale (1 = always to 6 = never). A composite score of 20 or above was indicative of at risk for developing a clinical eating disorder. The questionnaire also asked five questions regarding eating disorder behaviors such as binging, purging, and compensatory behaviors. A participant was also at risk for developing an eating disorder if he/she reported binging or compensatory behaviors at a
frequency deemed unhealthy by the authors. The EAT-26 has been validated and deemed reliably (Cronbach’s alpha = 0.90). 144

Body dissatisfaction was assessed using a shortened version 145 of the Body Shape Questionnaire (BSQ). 146 The original 34-item questionnaire was unidimensional and unnecessarily long, thus, shortened versions were developed. 145 The version that was used in this study consisted of 16 items, 145 rated on a Likert scale (1 = never to 6 = always). Items were summed to form a composite score. This questionnaire has been validated and deemed reliable (Cronbach’s alpha = 0.96). 145

Thin-ideal internalization was assessed using a subscale of the Sociocultural Attitudes Towards Appearance Scale-3 (SATAQ-3) that measured internalization of ideal body images portrayed in the media. 147 This subscale consisted of nine items, each rated on a Likert scale from 1 to 5 (1 = Completely Disagree to 5 = Completely Agree). The authors have reported a Cronbach’s alpha of 0.92-0.96 for this subscale. 147

Questions were adapted from the National Health and Nutrition Examination Survey (NHANES) to assess physical activity. Participants were asked on how many days a week they participate in vigorous, moderate, and incidental physical activity, as well as how much time (in minutes) they spend doing each of these on a typical day. Responses to these questions were used to calculate total minutes of physical activity per week.

**Predictors.** Demographic variables included age, race, and gender. Descriptive variables included year in college, major, delivery mode of their respective course (online or in-class), and cohort (Fall 2013 or Spring 2014). Students were asked to report their
height and weight at each time point, which was used to calculate body mass index (BMI).

**Data Analysis**

All analyses were conducted using SAS 9.3 (SAS Institute Inc., Cary, North Carolina). First, several data management steps were taken. A composite intuitive eating score was calculated by taking the average of the 23 questions on the IES-2. Four subscales (unconditional permission to eat; eating for physical rather than emotional reasons; reliance on hunger and satiety cues; and body-food congruence) were calculated by taking the mean of the appropriate questions. A composite disordered eating score was calculated from the total of all of the questions on the EAT-26. A dichotomous variable was created to identify those at risk for developing a clinical eating disorder; participants were at risk if they had a score of 20 or above on the EAT-26 or if they reported binging or compensatory behaviors at a frequency deemed unhealthy by the authors. Three eating pathology subscales (dieting, bulimia & food preoccupation, and oral control) were calculated from the sum of the appropriate items of the EAT-26. A body dissatisfaction score was calculated from the sum of the BSQ. A thin-ideal internalization score was calculated by taking the sum of the nine questions from the SATAQ-3. The physical activity questions were transformed into total minutes of physical activity per week.

Means and standard deviations were calculated by exposure status for continuous variables: age, BMI, intuitive eating score and subscales, disordered eating and subscales, body dissatisfaction, thin-ideal internalization, and physical activity. Frequencies were
calculated by exposure status for categorical variables: race, gender, year in college, mode of delivery, cohort, and at risk for developing an eating disorder. Analysis of Variance (ANOVA) and chi-square analysis assessed if significant differences existed between groups at baseline. Change scores for the outcome variables were calculated by subtracting baseline scores from post-test and follow-up scores for each of the outcomes.

**Specific Aim #1:** To determine the effects of a 16-week curriculum-based lifestyle intervention on health behavior outcomes (intuitive eating, physical activity, disordered eating, body dissatisfaction, and thin-ideal internalization) in college students.

**Hypothesis #1:** Students who completed the intervention course experienced increased intuitive eating and physical activity, and decreased disordered eating, body dissatisfaction, and thin-ideal internalization compared to students who do not take the course.

To address this hypothesis, simple and multivariable linear regression models were used to examine the difference in change scores between the intervention and comparison groups at post-test and follow-up. Then, multivariate linear regression was performed including time as a linear variable to assess the change in outcome variables for students with complete data at all three time points.
Limitations

Since the delivery of the intervention was via the academic course, it was not possible for students to be randomized into an intervention and control class. As a result, the sample was a convenience sample. Thus, one potential limitation in this research was selection bias. Since similar studies have demonstrated that participants who elected to enroll in such a course have higher rates of disordered eating and body dissatisfaction than the comparison course, 85,86 bivariate statistical tests assessed whether the two groups differ at baseline on relevant characteristics. If the intervention students differed from the comparison students, these variables will be controlled for in the statistical analyses. Another limitation was attrition. To retain participation, students were compensated for completing the surveys. Differences between those who completed the surveys and those who did not complete the surveys were examined and implications were discussed. Finally, testing could have impacted the students’ responses at post-test and/or follow-up. Since the intervention course focused heavily on intuitive eating, it is possible that students who participated in the survey recognized many of the questions relevant to intuitive eating at post-test and/or follow-up. This was a limitation of the study design.
Methods Aim 2

Study design

The purpose of aim 2 was to develop a valid and reliable instrument to measure the knowledge, attitudes, and practices regarding intuitive eating among registered dietitian/nutritionists (RD/Ns). Aim 2 was addressed using a cross-sectional study design. This research was reviewed and approved by the Kent State University Institutional Review Board (IRB).

Study participants

The Commission on Dietetic Registration (CDR) is the governing body responsible for the rigorous credentialing process for nutrition and dietetics professionals in the United States (U.S.). To support students completing research pertaining to the dietetics profession, the CDR provided a complementary list of contact information for all RD/Ns in the U.S. To obtain this list, the researcher requested this database by completing an application explaining the purpose and methods of the proposed study. Upon approval, the CDR provided the researcher with the requested information. Contact information for 88,834 RD/Ns in the U.S. was provided. To collect data to address Aim 2, the survey was distributed first to a 10% random sample of the RD/Ns to conduct initial validity analyses and then to the remaining 90% of the RD/Ns to complete the validity analysis.
Instrument

The development of the survey instrument underwent several phases. The original instrument was developed by the researcher, who consulted two other researchers, both with knowledge of intuitive eating, to ensure content validity. Next, the instrument was sent to the dietetic interns at Kent State University to pilot test the survey. Interns completed the survey and provided feedback to the researcher about anything that was unclear and gave suggestions to improve the face validity of the instrument. The original instrument can be found in Appendix E.

Measures

Descriptive Characteristics. Participants were asked to report their gender, age, race, highest level of education, main practice setting, state of practice, and if they had completed a certificate in pediatric or adult weight management. Participants were asked if they have ever heard of intuitive or mindful eating and if they currently counsel overweight and/or obese clients for weight management; if they did, the number of years’ experience they have in this practice.

Practices. Those participants who reported that they do currently counsel overweight and/or obese clients for weight management were asked to complete this section. Participants were asked to report on a Likert scale (0=never, 1=rarely, 2=sometimes, 3=often, 4=usually) how often they use various practices when counseling overweight and/or obese clients. This section of the survey was adapted from a tool used
by Barr and colleagues to describe practices utilized by Canadian dietitians regarding both traditional and intuitive eating practices.

**Knowledge.** All participants were asked to respond to this section. The first ten questions were adapted from the Intuitive Eating Scale – and describe intuitive eating behaviors. Participants were asked if each statement is characteristic of an intuitive eater. The next four questions assessed knowledge regarding research that has been published on intuitive eating. Response categories included true, false, or do not know for each knowledge item.

**Attitudes.** All participants were asked to respond to this section. This section gauged the attitudes of RD/Ns towards various eating and weight behaviors and attitudes. First, participants were asked to what degree they support the use of intuitive eating to promote a healthy lifestyle on a Likert scale (1=strongly support, 2=support, 3=neutral, 4=support, 5=strongly support). Then, participants were asked to rate the degree to which they agree or disagree with each of the remaining statements on a Likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). Nine items are consistent with and four items are inconsistent with the intuitive eating lifestyle.

**Data Analysis**

**Specific Aim #2:** To develop a valid and reliable instrument to measure the knowledge, attitudes, and practices regarding intuitive eating among RD/Ns.
Hypothesis #2: The items in the instrument would represent three valid and reliable factors (knowledge, attitudes, and practices).

Construct validity was examined first with exploratory factor analysis (EFA) using principal axis factoring to extract factors by estimating the shared variance between items and oblique rotation of factors with promax rotation in order to allow the factors to be correlated. The correlation matrix was examined to ensure there was no singularity or multicollinearity. The sampling adequacy was assessed with the Kaiser-Meyer-Olkin (KMO) value. The communality values were assessed to assure there is shared variance between the items. The number of factors was determined by examining eigen values and the scree plot. Items with a factor loading of at least 0.35 and a cross-loading difference of at least 0.2 were retained to create the final instrument. Construct validity was further assessed with confirmatory factor analysis (CFA). Items with a factor loading of at least 0.35 were retained in each factor. Cronbach’s alpha was calculated to assess reliability.

Limitations

One limitation was response rate. The survey was open for two months and each RD/N received the original request and two reminders. However, the survey was voluntary and no incentives were offered. A second limitation was selection bias. Participants self-selected to participate in the survey. Those who chose to participate may
be different from those who chose not to participate. Responses may not necessarily have represented all U.S. RD/Ns.
Methods Aim 3

Study design

The purpose of aim 3 was threefold: to describe RD/Ns’ knowledge of and attitudes towards intuitive eating; to describe RD/Ns’ frequency of use of traditional, restrictive practices and non-restrictive, intuitive eating practices; to describe which RD/Ns are more likely to utilize non-restrictive, intuitive eating strategies. Aim 3 was addressed using a cross-sectional design. This research was reviewed and approved by the Kent State University Institutional Review Board (IRB).

Study participants

The survey was distributed to the remaining 90% of RD/Ns (n=79,950) not recruited for Aim 2. The survey was open for approximately three months during which time each RD/N received three reminders to complete the survey.

Instrument

The instrument that was developed and validated to address Aim 2 was used in this study. For details of the development of this instrument, see Methods for Aim 2.

Measures

Knowledge, Attitudes, and Practices. The survey instrument that was validated in Aim 2 was used to measure RD/Ns’ knowledge of and attitudes towards intuitive eating
and use of traditional/restrictive and non-restrictive practices with weight management clients. Knowledge of intuitive eating was measured with 14 true or false questions, including a “don’t know” option to each question. Attitudes towards intuitive eating was measured with seven items rated on a Likert scale (for the first item, 1=strongly do not support to 6= strongly support; for the remaining six items, 1=strongly disagree to 6=strongly agree). Each of these items also included a “don’t know” option to distinguish those who are not familiar with intuitive eating from those who have a neutral option regarding intuitive eating. To measure practices, participants were asked how often they use each of 17 weight management strategies (1=never to 5=usually). Seven items represented restrictive/traditional weight management practices while ten items represented non-restrictive/intuitive eating strategies.

**Other Changes to the Instrument.** Several RD/Ns contacted the researcher, informing the researcher that the recipient was retired. Thus, a question was added at the beginning of the survey to identify retired RD/Ns. The CDR now also offers a Certificate of Training in Level 2 Adult Weight Management; this question was altered to reflect this option. The final version of the questionnaire can be found in Appendix F.

**Descriptive Characteristics.** Participants were asked to self-report gender, age, race, ethnicity, highest level of education completed, main practice setting, state in which they practice, if they have completed a certificate of training in weight management, and if they currently counsel overweight and/or obese clients for weight management.
Data Analysis

Specific Aim #3: To describe the knowledge, attitudes, and professional practices regarding the intuitive eating lifestyle and describe the relationship between these factors in registered dietitian/nutritionists (RD/Ns).

Data from participants who completed the survey for validation (see Methods for Aim 2) were be included in the analysis since no major changes were made to the instrument. A mean age was calculated and frequencies of gender, race, highest education level, practice setting, and completion of certificates of training. Frequencies for each item were calculated to display RD/Ns’ knowledge of and attitudes towards intuitive eating and use of restrictive/traditional and non-restrictive/intuitive eating practices. A total knowledge score was calculated by taking the sum of the 14 questions answered correctly from the knowledge section of the survey with a higher total reflecting greater knowledge. A total attitudes score was calculated by taking the sum of the five items with a higher total reflecting more positive attitudes towards the intuitive eating lifestyle; two items were not included in the total score that did not load appropriately in the confirmatory factor analysis. Any response reported as “don’t know” was regarded as a nonresponse. A total score was calculated to gauge how often RD/Ns use restrictive/traditional and non-restrictive/intuitive eating practices. Total non-restrictive/intuitive eating scores were categorized into quartiles. Descriptive statistics portrayed the participants by quartile. To examine differences by quartile, chi-square
analysis and ANOVA was conducted respectively for categorical and continuous variables.

Limitations

One limitation to this study was response rate. The survey was open for three months during which each RD/N received an original request and three reminders. Participation was completely voluntary and no incentives were offered for participation. Another limitation was selection bias. The participants who chose to respond may not be representative of all U.S. RD/Ns and the results may not reflect the knowledge, attitudes, and practices of all RD/Ns. A third limitation was the content of the survey. Although the survey was validated, the list of practices was not exhaustive. Thus, this study characterized RD/Ns’ use of the included practices but did not characterize all strategies that may be used by RD/Ns.
Chapter 3

Specific Aim 1

Use of College Curriculum to Increase Intuitive Eating in College Students
Abstract

Weight-related issues such as eating disorders, overweight, and obesity are prevalent in college students, but interventions to address these issues have achieved little success. To increase the success of such programs, researchers have suggested that programs should focus on risk factors that are common to all weight-related issues, such as dieting, body dissatisfaction, and thin-ideal internalization. Others have argued that intervention programs should shift the focus away from decreasing risk factors and towards promoting adaptive habits, such as intuitive eating. The purpose of this study was to evaluate a curriculum-based intervention intended to promote intuitive eating and decrease shared risk factors in college students. An elective course was offered at a large Midwestern university for two semesters. Students enrolled in the intervention course for a 16-week semester during which they attended lectures, read various articles, participated in class discussion, and completed homework assignments. Students enrolled in an introductory nutrition course were recruited to serve as a comparison group. All participants were asked to completed surveys at the beginning of the semester (baseline), the end of the semester (post-test), and three months following the end of the semester (follow-up). Multivariable linear regression was used to analyze change scores and multivariate linear regression was used to analyze change in outcomes over time. Compared to the comparison group, intervention students increased overall intuitive eating behaviors ($\beta=0.12; p=.0036$), unconditional permission to eat ($\beta=0.28; p<.0001$), and eating based on internal cues ($\beta=0.15; p=.0175$) over the three time points. No differences between groups were observed in disordered eating, body dissatisfaction,
thin-ideal internalization, or physical activity over the three time points. Results may be limited by selection bias, attrition, and study design. This study revealed that college curriculum may be a promising approach to promote adaptive eating habits in a large number of young adults.

Introduction

Eating disorder behaviors, such as binge eating, fasting, dietary restraint, self-induced vomiting, laxative and/or diuretic misuse, and excessive exercise have been well documented among both male and female college students. Interventions to decrease the prevalence of these behaviors have been conducted over the last three decades with limited success. A meta-analysis of eating disorder prevention programs revealed that about half of all programs have been successful in reducing risk factors for eating disorders while only a little more than a quarter of all programs have been successful in reducing or preventing eating pathology. Eating disorder prevention programs conducted in college students in particular have been limited by small sample sizes, insufficient inclusion of male participants, and inadequate follow-up.

Additionally, there is evidence that several individuals with eating disorders such as bulimia nervosa (BN), binge eating disorder (BED), and eating disorders not otherwise specified (EDNOS) are overweight or obese, indicating overlap between multiple weight-related issues. In fact, there is a reciprocal relationship between eating disorder behavior and weight; engaging in eating disorder behaviors leads to weight gain while those with an increased body mass index (BMI) are more likely to engage in eating
disorder behaviors. Thus, to improve success of programs and reach a larger number of people, eating disorder intervention programs could be integrated with obesity intervention programs. Eating disorders, overweight, and obesity share several risk factors including body dissatisfaction, dieting, media use, and thin-ideal internalization. Therefore, programs that address all of these risk factors simultaneously may be more effective and reach more people than addressing these issues separately. To date, programs that have focused on reducing shared risk factors in elementary through high school students have had mostly positive results.

Researchers have noted that the success of eating behavior programs may be limited by the fact that these programs predominantly focus on pathology. The absence or reduction of risk factors and maladaptive habits, however, may not be the equivalent of practicing adaptive eating attitudes and behaviors. As a result, investigators in the field are calling for research on the promotion of adaptive eating habits. One such approach is a health-centered, non-diet lifestyle, known as intuitive eating. There are four central features that characterize intuitive eating. The first, unconditional permission to eat, refers to willingness to eat whenever the body indicates hunger and to not avoid foods deemed “bad” or “unhealthy.” The second, eating for physical rather than emotional reasons, reflects the instinct to use food to satisfy a physical need and not to cope with emotional fluctuation or distress. The third, reliance on internal hunger and satiety cues, refers to the ability to let physiological hunger cues initiate eating and physiological fullness and satiety cues dictate when to stop. Finally, body-food choice congruence reflects the tendency to choose foods that
honor health and body functioning (i.e. foods that are nourishing and promote energy) while still choosing foods that are palatable.  

There is evidence that intuitive eating is associated with a lower BMI, and greater psychological well-being, as demonstrated by optimism, proactive coping, body appreciation, self-esteem, and overall life satisfaction. Likewise, there is a strong inverse relationship between intuitive eating and eating disorder behavior, body dissatisfaction, pressure for thinness, thin-ideal internalization, body surveillance, body shame, and poor interoceptive awareness.

Stice & Ragan have argued that because middle and high schools have limited time and resources to devote to such programs, a college elective course could allow for an intervention with greater intensity while addressing a high risk population. Students in the intervention course decreased thin-ideal internalization, body dissatisfaction, dieting, eating disorder behaviors, and BMI while control students significantly increased BMI during the study period. Others have found that this approach can decrease frequency and severity of body dissatisfaction and eating disorder behavior, but found no change in BMI. In yet another curriculum-based intervention, students enrolled in this course not only decreased dieting, but increased body satisfaction and intuitive eating. Evidence regarding curriculum-based interventions has been limited due to small sample sizes, a lack of comparison groups and follow-up, and restriction to female participants. The purpose of this study is to evaluate a curriculum-based intervention intended to promote intuitive eating and physical activity and decrease disordered eating, body dissatisfaction, and thin-ideal internalization in college students.
Methods

Participants

The study participants for the intervention group were students who enrolled in and completed the course “Dieting, Body Image, and Healthy Weight in College.” The study participants for the comparison group were students who enrolled in and completed a basic undergraduate nutrition course. All students who completed the baseline survey and either or both the post-test and the follow-up surveys were included in the data analysis.

Procedures

All undergraduate students were eligible to enroll in the elective course, “Dieting, Body Image, and Healthy Weight in College.” To advertise the course, flyers were sent to public health, nutrition, and exercise science students, distributed through the Body Acceptance Movement student group, the Office of Health Promotion, and the College of Public Health, and posted in the dorms on campus. The course was offered two semesters, Fall 2013 and Spring 2014, to increase sample size.

The instructor explained the research project to the students on the first day of class and informed them that they would receive an e-mail with a link to the survey. The survey was completely voluntary, not associated with their grade in the course, and the instructor did not know who chose to participate. Students who chose to participate followed the link provided. Students were prompted to read and agree to the informed
Students could have withdrawn from the study at any time by discontinuing the survey or choosing not to participate in follow-up surveys. Students had until the end of the second week of class to participate in the baseline survey to maximize time for response before any material relevant to the intervention was presented. All students who completed the baseline survey were e-mailed the same survey at the end of the semester (post-test), and three months following the end of the semester (follow-up). All surveys were completed using online survey software. Students in the first cohort received one $10 gift card for completing both the baseline and post-test survey. Due to a low response rate and in an attempt to decrease attrition, students in the first cohort received a $5 gift card for completing the follow-up survey and students in the second cohort received a $5 gift card after each survey completed. All procedures were reviewed and approved by the Kent State University Institutional Review Board (IRB).

*Intervention*

The in-class session met twice a week for an hour and 15 minutes at a time for 15 weeks and completed a final exam during the 16th and final week of the semester. Students were required to attend class lectures, complete assigned readings, and participate in class discussion and activities. Lectures were recorded for the online session; these students completed the same activities and assignments as the in-class session each week. The course educated the students on basic nutrition, implications of dieting, principles of intuitive eating, issues regarding body image in our society, and the
public health impact of obesity and eating disorders. Homework assignments and class activities utilized behavior change strategies to assist students in examining their current relationship with food and practice the principles of intuitive eating. Such strategies included the application of the Health Belief Model, cognitive behavior therapy techniques, cognitive dissonance, media literacy, role play, goal setting, and self-efficacy.

**Comparison Group**

Students enrolled in a basic undergraduate nutrition course were recruited to serve as the comparison group. This course educated students on basic human nutrition, covering mostly traditional topics including energy balance, weight control, nutrient needs, diet selection, nutrition metabolism, and nutrition-related diseases. Students were recruited from the online and in-class sections during both semesters. Any student enrolled in the comparison course during the second semester who completed the intervention course in first semester was excluded from the second cohort of the comparison group.

**Measures**

**Descriptive Characteristics.** Demographic variables included age, race, and gender. Descriptive variables included year in college, major, delivery mode of their respective course (online or in-class), and cohort (Fall 2013 or Spring 2014). Students were asked to report their height and weight at each time point, which was used to calculate BMI.
**Intuitive Eating.** Intuitive eating attitudes and behavior were measured using the Intuitive Eating Survey-2 (IES-2). The IES-2 measured overall level of intuitive eating as well as four subscales: unconditional permission to eat; eating for physical rather than emotional reasons; reliance on hunger and satiety cues; and body-food congruence. Each of the 23 items were rated on a Likert scale (1 = strongly disagree to 5 = strongly agree). This tool has been validated in college women and men. Cronbach’s alphas for each subscale range from 0.77 to 0.92. In this study, the Cronbach’s alpha for total intuitive eating score (α = 0.81) and subscales (α = 0.77 to 0.89) were acceptable.

**Eating Disorder Attitudes and Behaviors.** Eating disorder attitudes and behaviors were measured using the Eating Attitudes Test (EAT-26). The EAT-26 is one of the most widely used measures of symptoms and concerns that are characteristic of eating disorders. A composite score was calculated to measure eating disorder risk and subscales measured three specific domains of eating disorder attitudes and behavior: dieting, bulimia & food preoccupation, and oral control. The first 26 items were rated on a Likert scale (1 = always to 6 = never). A composite score of 20 or above was indicative of someone who was at risk for developing a clinical eating disorder. The questionnaire also asked five questions regarding eating disorder behaviors such as binging, purging, and compensatory behaviors. A participant was also at risk for developing an eating disorder if he/she reported binging or compensatory behaviors at a frequency deemed unhealthy by the authors. The EAT-26 is valid and reliable, with a Cronbach’s alpha of 0.90. In this study, the Cronbach’s alpha for total eating disorder attitudes and behaviors was acceptable (α = 0.88).
Body Dissatisfaction. Body dissatisfaction was measured using a shortened version of the Body Shape Questionnaire (BSQ). The original 34-item questionnaire is unidimensional and unnecessarily long, thus, shortened versions were developed. The version used in this study consisted of 16 items, rated on a Likert scale (1 = never to 6 = always). Items were summed to form a composite score. This questionnaire is valid and reliable (α = 0.96). In this study, the Cronbach’s alpha for body dissatisfaction was high (α = 0.97).

Thin-ideal Internalization. Thin-ideal internalization was measured using a subscale of the Sociocultural Attitudes Towards Appearance Scale-3 (SATAQ-3) that measured internalization of ideal body images portrayed in the media. This subscale consists of nine items, each rated on a Likert scale from 1 to 5 (1 = Completely Disagree to 5 = Completely Agree). The authors have reported a Cronbach’s alpha of 0.92-0.96 for this subscale. In this study, the Cronbach’s alpha for thin-ideal internalization was high (α = 0.97).

Physical Activity. Questions were adapted from the National Health and Nutrition Examination Survey (NHANES) to assess physical activity. Participants were asked on how many days a week they participate in vigorous, moderate, and incidental physical activity, as well as how much time (in minutes) they spend doing each of these on a typical day. Responses to these questions were used to calculate total minutes of physical activity per week.
Data Analysis

First, several data management steps were taken. Composite scores were calculated for each of the outcome variables. In addition, change scores for the outcome variables were calculated by subtracting baseline scores from post-test and follow-up scores. A pairwise deletion approach, or available case analysis, was taken in order to analyze all available data; total scores and change scores were calculated for all students who completed the relevant items to calculate these scores. Two variables, race and year in school, were transformed into dichotomous variables (white and non-white; freshmen/sophomores and juniors/seniors). Several outliers in age were identified. In order to analyze results representative of the underlying population, undergraduate college students, only participants between 18-25 years of age were included in analysis. The distribution of BMI was also positively skewed. This variable was truncated to ensure a normal distribution. Extreme values were converted to a value that was equal to three standard deviations from the mean. All outcome measures (raw scores and changes scores) had relatively normal distributions with skewness values within the limits of extreme skewness as defined by an absolute value of at least three. Extreme values of physical activity (>2.5 hours/day for 7 days a week) were treated as non-response.

Bivariate analysis was used to assess differences between intervention and comparison groups for descriptive variables and baseline measures of the outcome variables. Simple and multivariable linear regression models were used to examine the difference in change scores between the intervention and comparison groups at post-test
and follow-up. Multivariate linear regression was performed including time as a linear variable to assess the change in outcome variables for students with complete data at all three time points. Covariates (BMI and age) were included in the adjusted models. There were not enough students who were male, non-white, at risk for developing an eating disorder, or enrolled online to examine the effects of these characteristics on the outcomes. Finally, bivariate analysis assessed differences between those with complete and incomplete data to examine the effect of attrition.

Results

Response Rate

In the first cohort, there were 75 students enrolled in the intervention course. Thirty-four students completed the survey at baseline (45.33%), 22 students completed the survey at post-test (29.33%), and 14 students completed the survey at the three month follow-up (18.67%). Likewise, there were 327 students approached in the comparison course. Seventy-four students completed the survey at baseline (22.63%), 45 students completed the survey at post-test (13.76%), and 44 students complete the survey at the three month follow-up (13.46%). In the second cohort, there were 88 students enrolled in the intervention course. Forty-three students completed the survey at baseline (48.86%), 22 students completed the survey at post-test (25.00%), and 25 students completed the survey at follow-up (28.41%). There were 253 students approached in the comparison course. One hundred one students completed the survey at baseline (39.92%), 57 students
completed the survey at post-test (22.53), and 50 completed the survey at follow-up (19.76%).

Effect of the Intervention at Post-test

One hundred forty-one students were included in the analysis from baseline to post-test (Table 3.1). Students who completed the survey at baseline and post-test were mostly white, female students. A greater proportion of the intervention students were upperclassmen (p<.0001), about one year older (p=.0003), and more likely to be enrolled in class online (p<.0001; Table 3.1). At baseline, there were no differences in intuitive eating, body dissatisfaction, thin-ideal internalization, physical activity, dieting, or oral control between groups, but intervention students had significantly lower disordered eating (p=.0242) and bulimia and food preoccupation (p=.0201; Table 3.1).

In the bivariate analysis, the intervention students had a significantly greater increase in total intuitive eating (p<.0001), unconditional permission to eat (p<.0001), and eating based on internal cues (p=.0069; Table 3.2). The intervention also had a significantly greater increase in the bulimia and food preoccupation subscale (p=.0005). There were no significant differences in any of the other outcomes (Table 3.2). Likewise, in the unadjusted regression analysis, students enrolled in the intervention had a significantly greater increase in total intuitive eating score (β=0.37; p<.0001; Table 3.3), unconditional permission to eat (β=0.77; p<.0001; Table 3.4), and eating based on internal cues (β=0.37; p=.0069; Table 3.4). Students in the intervention also had a
significantly greater increase in bulimia and food preoccupation ($\beta=1.81$; $p=.0005$). BMI and age did not significantly predict change in any outcomes (Tables 3.3-3.5).

In the adjusted models, the intervention effect on change in total intuitive eating ($\beta=0.44$; $p=<.0001$; Table 3.6), unconditional permission to eat ($\beta=0.85$; $p<.0001$; Table 3.7), and eating based on internal cues ($\beta=0.45$; $p=.0017$; Table 3.7) were stronger. The effect of the intervention on increased bulimia and food preoccupation was weaker, but still significant ($\beta=1.30$; $p=.0009$). Age was a significant predictor of a slight decrease in total intuitive eating ($\beta=-0.06$; $p=.0238$) and BMI was a significant predictor of an increase in eating for physical rather than emotional reasons ($\beta=0.03$; $p=.0327$) and oral control ($\beta=0.12$; $p=.0132$).

There were 34 students in the intervention and 77 students in the comparison group that completed baseline but did not complete the post-test. There were no significant differences between those who completed post-test and those who did not complete post-test in sex, race, year in school, mode of delivery, risk of developing an eating disorder, age, or BMI. Those who did not complete post-test had significantly higher eating for physical rather than emotional reasons. Among the intervention students only, those who did not complete the post-test had significantly higher scores on total disordered eating ($\mu=5.44$; $p=.0365$) and dieting ($\mu=3.38$; $p=.0350$).

Effect of the Intervention at Follow-up

One hundred thirty-one students were included in the analysis from baseline to three month follow-up (Table 3.9). Similar to those who completed baseline and post-
test, intervention students were slightly older, more likely to be upperclassmen (p<.0001), and enrolled online (p<.0001). There were no significant differences in baseline scores for any of the outcome variables (Table 3.9).

In the bivariate analysis, the intervention had a significantly greater increase in total intuitive eating (p=.0172), unconditional permission to eat (p=.0029), and eating based on internal cues (p=.0341; Table 3.10). There were no significant differences in change in any of the other outcomes (Table 3.10). In the unadjusted regression analysis, students enrolled in the intervention had a significantly greater increase in total intuitive eating score (β=0.20; p=.0172; Table 3.11), unconditional permission to eat (β=0.41; p=.0029; Table 3.12), and eating based on internal cues (β=0.29; p=.0341; Table 3.12). The intervention did not predict change in any of the other outcomes (Tables 3.11-3.13). BMI and age did not significantly predict change in any of the outcome (Tables 3.11-3.13).

In the adjusted models, the effect of the intervention on change in total intuitive eating held (β=0.19; p=.0443; Table 3.14). The effect of the intervention on change in unconditional permission to eat was stronger (β=0.44; p=.0042; Table 3.15). The effect on increase in eating based on internal cues was stronger, but no longer significant (β=0.26; p=.0811; Table 3.15). No other significant changes in outcomes were observed. While there was a significant increase in bulimia and food preoccupation at post-test, this adverse effect was not observed at follow-up.

There were 33 students in the intervention and 88 students in the comparison group that completed the baseline survey but did not complete the follow-up survey.
There were no significant differences between those who completed follow-up and those who did not complete post-test in sex, race, year in school, mode of delivery, risk of developing an eating disorder, age, or BMI. Those who did not complete the follow-up had significantly higher physical activity ($\mu=86.04; p=.0464$), but did not differ on any other baseline measures of outcome variables. Among the intervention students only, there were no significant differences between those who completed follow-up and those who did not on any baseline measures.

*Effect of the Intervention over Time*

Ninety-six students completed the survey at all three time points (Table 3.17). Similar to previous analyses, a larger proportion of the intervention students were upperclassmen ($p<.0001$) and enrolled online ($p<.0001$). Intervention students were about a year older ($p<.0001$). There were no significant differences in any of the baseline measures of the outcome variables. The interaction between the intervention and time was significant for total intuitive eating score ($\beta=0.12; p=.0036$; Table 3.18; Figure 3.1), unconditional permission to eat ($\beta=0.28; p<.0001$; Table 3.19; Figure 3.2), and eating based on internal cues ($\beta=0.15; p=.0175$; Table 3.19; Figure 3.3). The effects for body dissatisfaction, thin-ideal internalization, physical activity, and eating for physical reasons were in the intended direction but not significant (Tables 3.18 & 3.19). There were no significant decreases in total disordered eating or any of the disordered eating subscales. While there was a significant increase in bulimia and food preoccupation at post-test, this adverse effect was not observed over time.
There were 21 students in the intervention and 55 students in the comparison group who completed baseline but then did not complete post-test and follow-up. Those who did not complete the post-test or follow-up had a significantly lower baseline thin-idealization score ($\beta=-0.37; p=.0427$) and greater physical activity ($\beta=107.47; p=.0322$) but did not differ on any other variables. Among intervention students only, there were no significant differences between those who completed post-test and follow-up and those that did not.

Discussion

The results demonstrate that the intervention was effective in increasing intuitive eating in students enrolled in the intervention course, particularly two aspects of intuitive eating, unconditional permission to eat and eating based on internal cues of hunger and fullness. These effects were evident from baseline to post-test, baseline to three-month follow-up, and when examining all three time points together; although the effect on eating based on internal cues from baseline to follow-up was only approaching significance after adjusting for covariates.

Results revealed no significant decrease in body dissatisfaction, thin-ideal internalization, or any disordered eating variables at post-test or follow-up. At post-test, students in the intervention course significantly increased bulimia and food preoccupation. This was the only factor that significantly changed in the unintended direction. At baseline, intervention students had a significantly lower bulimia and food preoccupation score that was nearly zero. In addition, an increase in this subscale was not
present at follow-up nor was there evidence at all three time points that there were adverse effects regarding bulimia and food preoccupation. Thus, this increase observed at post-test could reflect a regression to the mean rather than an actual increase in bulimia and food preoccupation attitudes and behaviors due to the intervention. The low baseline bulimia score at baseline for the intervention students could also simply reflect that the intervention students were not high risk regarding this aspect of disordered eating.

Using a similar intervention delivery, Stice & Ragan\textsuperscript{86} observed a significant reduction in thin-ideal internalization, body dissatisfaction, dieting, and eating disorder behaviors at post-test. When this study was replicated, Stice, Orjada, & Tristan\textsuperscript{85} found similar results that were also sustained at six-month follow-up. In a similar study, Springer and colleagues\textsuperscript{87} observed a decrease in body dissatisfaction and eating disorder behavior.

One explanation for the difference in results could be response rate. All students enrolled in each of these studies in the intervention courses agreed to complete the surveys\textsuperscript{85-87} while at least 75\% of the students enrolled in the comparison courses agreed to participate in the two studies that included a comparison group.\textsuperscript{85,86} In the current study, response rates were much lower, possibly due to the delivery mode of the survey. In the previous studies, students were asked to complete the surveys in class.\textsuperscript{85-87} In the current study, the survey was explained in class but then a link to the survey was e-mailed to all potential participants. The less personal approach may have led some students to neglect the survey. On the other hand, it is possible that when the survey was
delivered in person, students may have felt compelled to participate or could have answered in a desired manner.

Another reason for the difference in results could be the content of the intervention courses. In the former two studies, the focus of the entire semester was on the pathology, epidemiology, risk factors, treatment, and prevention of eating disorders and body image disturbance. In the latter study, the majority of the semester focused on body image with some material addressing eating disorders and obesity. In the current study, the course focused heavily on promoting the different aspects of intuitive eating rather than emphasizing eating pathology. Even though intuitive eating is inversely related to eating disorder symptomology and risk factors, Tylka and Wilcox have argued that intuitive eating is not simply a lack of eating disorder symptomology. Thus, the focus on increasing intuitive eating may not necessarily equate to a decrease in disordered eating; current results provide further evidence for this notion.

In addition, previous studies indicated that students who enrolled in the intervention courses had significantly higher rates of eating disorder symptoms. Thus, these interventions were targeting higher risk students. There is evidence that eating disorder prevention programs that target high risk populations are more effective. In the current study, students enrolled in the intervention course did not differ from comparison students on baseline measures of eating disorder risk factors or behaviors. Although differences were not significant, the intervention students actually had lower scores on most of the risk factor measures. Consequently, this intervention may not have been targeted at high risk individuals.
Hawks and colleagues also delivered an intervention through college curriculum intended to decrease disordered eating and increase intuitive eating. Although this study used a different intuitive eating scale, the four subscales (intrinsic eating, extrinsic eating, anti-dieting attitudes, and self-care) are similar to those used in this study. In their analysis, the researchers found that students who took this course that were identified as high-dieters improved total intuitive eating and three of its subscales: intrinsic eating, extrinsic eating, and anti-dieting attitudes.

The intrinsic eating subscale is similar to eating based on internal cues, which also increased significantly after the intervention and was approaching significance at follow-up in the current study. The extrinsic eating subscale is similar to eating for physical rather than emotional reasons; unlike Hawks and colleagues’ study, the current study did not observe a significant change in this subscale. The anti-dieting attitudes subscale is similar to unconditional permission to eat which also significantly increased at post-test and follow-up in the current study. The final subscale, self-care, measures value placed on health rather than weight, while in the current study, the fourth subscale, body-food congruence, measures degree to which the individual chooses foods that help his/her body function efficiently. Neither Hawks and colleagues’ study nor the current study observed changes in this subscale. Although the results were promising, Hawks and colleagues’ study should be interpreted with caution. The researchers did not include a comparison group, nor did they conduct a follow-up. Results may also differ from the current study due to response rates; similar to the others, all of the students enrolled in the course participated in the survey.
There are several reasons why no significant changes were observed for physical activity. One of the ten principles of intuitive eating is to shift the focus on exercise to the way it feels to move the body and find activities that are enjoyable rather than emphasizing calories burned with the sole goal of weight loss. Since the majority of the course focused on changing eating behaviors and attitudes, only one lecture was dedicated to this principle. During this time, didactic information was presented and the class participated in discussion to overcome barriers and to find ways to be active that are enjoyable. A more intense intervention (i.e. longer time and/or application of behavior change strategies) is likely necessary to observe an increase in physical activity.

Additionally, the current study only assessed minutes of physical activity per week. There could be several factors that affect minutes of physical activity not related to mental health that were not assessed in this study (i.e. student athletes may exercise several hours per day, climate/season, etc.). There was also a wide range of physical activity minutes per week at baseline, suggesting that many students did not need to increase amount of physical activity. Consequently, researchers have suggested that qualitative dimensions of exercise (i.e. rigid exercise schedule, prioritization of exercise over other activities, feelings of guilt or anxiety if do not exercise), rather than quantity of exercise, have a greater association with disordered eating.¹⁵¹,¹⁵² These characteristics were not measured in this study.

Previous programs designed to address weight-related issues have achieved little success,⁵¹-⁵⁵,⁶⁵,⁶⁷,⁶⁹,⁷² reviewers are calling for nutrition practitioners to use theoretical framework to increase the effectiveness of programs.¹⁵³,¹⁵⁴ One review concluded that
diet and physical activity interventions that use established behavior change techniques (i.e. self-monitoring, goal-setting) were more effective than those that did not employ such strategies. 155 The current study suggests that in addition to psycho-education, cognitive dissonance, self-monitoring, and cognitive behavior therapy may be effective tools to help increase unconditional permission to eat. Similarly, self-efficacy, self-monitoring, benefits and barriers, and cognitive dissonance may be effective tools to increase eating based on internal cues of hunger and fullness. Since only the outcomes, not the specific strategies, were assessed, results should be interpreted with caution.

Similar strategies, including cognitive dissonance and self-monitoring, were utilized to attempt to increase eating for physical rather than emotional reasons. Results suggest that these strategies may not be effective for addressing this behavior. One possible explanation is that treatment of emotional eating may require more intense strategies or interventions. Future studies that take this intervention approach should consider spending more time on this particular behavior and perhaps employing more intense behavior change strategies. For example, there is evidence that mindfulness meditation is effective in decreasing emotional eating. 156

Self-monitoring was also applied to attempt to increase body-food congruence, or the tendency to mostly eat foods that help the body function efficiently. Interventions students reported no change in this subscale. One possible explanation for this is that self-monitoring may not be effective or intense enough to change this behavior. Another explanation could be that the intervention did not address this behavior at sufficient length; in the course, this topic was only addressed in one lecture. This was likely not
enough time spent on the concept of body-food congruence to change this behavior. There is also inconsistent evidence regarding the measurement of this particular subscale. Although Tylka and Kroon Van Diest \(^9^4\) provided initial evidence for the validation of this subscale, Camilleri and colleagues \(^{15^7}\) were unable to replicate validation for this particular factor. Thus, it is possible that there is some error in measurement for this factor. Future studies should reassess validation or consider testing a revision in the questions used to measure this factor.

One limitation of this study was response rate. While 47.2\% of the students enrolled in the intervention completed the survey at baseline, only 16.6\% of the students completed the survey at all three time points. Similarly, 30\% of the students enrolled in the comparison course completed the survey at baseline and only 13.1\% completed the survey at all three time points. While results of the current intervention provide promising evidence for the promotion of intuitive eating, we cannot fully evaluate the effects of the intervention without more complete data from participants.

There was also considerable attrition that could have affected the results. There were 34 intervention students that completed baseline but did not complete the post-test, 33 who completed baseline but did not complete the follow-up, and 21 students who completed baseline but did not complete post-test or follow-up. When differences were examined, the differences between those who did complete and those who did not complete were most likely to affect the results between baseline and post-test. Those who did not complete the post-test had significantly higher disordered eating. Thus, those
dropped out of the study may have been higher risk students who may have benefited the most from the intervention.

The intervention students who completed baseline and follow-up did not differ significantly from those who did not complete baseline so attrition is not expected to affect these results. Those who completed the survey at all three time points did not differ from those who completed baseline but not post-test and follow-up. Thus, these results were unlikely to be affected by attrition.

Another limitation is the generalizability of the results. Participants were mostly female. There were not enough male participants to draw conclusions about the effects of such an intervention on the outcomes for males. In the U.S., the combined rate for overweight and obesity is higher in men (74.1% for men vs. 64.5% for women) yet most studies that promote eating based on internal cues include only women. There is evidence to suggest that men are less likely to diet and thus, may respond better to an intuitive eating approach, though few interventions have included enough males to draw any conclusions.

Another limitation was that students were unable to be randomized to a condition because of the nature of the intervention. A quasi-experimental study has several threats to validation. One limitation is selection bias. The current study measured and controlled for differences between intervention and comparison groups but baseline differences between groups could not be fully assessed given the low response rate. Another limitation of the study design could be testing. Since the intervention course focused heavily on intuitive eating, it is possible that students who participated in the survey
recognized many of the questions relevant to intuitive eating at post-test and/or follow-up.

Despite these limitations, this study has several strengths. While many programs that address weight-related issues are limited by time and resources, an intervention delivered via a college curriculum allowed for an extensive intervention access to resources provided to all courses offered through the university (i.e. facility; time; internet access). A college course also has the potential to reach a large number of people who are considered a high risk population. Similar studies have been limited by a lack of comparison group and follow-up. Thus, another strength of this study is the inclusion of these components. Although randomization was not possible, inclusion of a comparison group increases validity of the results. Likewise, including a follow-up ensures that the increase in healthy behavior can be maintained.

In conclusion, this study provided evidence that a 16-week college curriculum intervention was effective in increasing intuitive eating in college students. Future studies should try to replicate these results with stronger research design and attempt to recruit students to participate in the research to increase response rate and decrease. Future studies should also evaluate the use of specific behavior change strategies to further our understanding of the adoption of intuitive eating behavior. Research is also needed with more diverse populations including males and individuals of varying races and ethnicities to understand the generalizability of this approach.
Table 3.1. Baseline Characteristics of Participants who Completed Baseline & Post-test

<table>
<thead>
<tr>
<th></th>
<th>Intervention (n=32)</th>
<th>Comparison (n=105)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1(2.86)</td>
<td>12(11.32)</td>
<td>.1176*</td>
</tr>
<tr>
<td>Female</td>
<td>34(97.14)</td>
<td>94(88.68)</td>
<td></td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>30(85.71)</td>
<td>95(89.62)</td>
<td></td>
</tr>
<tr>
<td>Non-white</td>
<td>5(14.29)</td>
<td>11(10.38)</td>
<td>.5447</td>
</tr>
<tr>
<td><strong>Year in College</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman/Sophomore</td>
<td>9(25.71)</td>
<td>69(65.71)</td>
<td>.5447</td>
</tr>
<tr>
<td>Junior/Senior</td>
<td>26(74.29)</td>
<td>36(34.29)</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td><strong>Course Delivery</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-class</td>
<td>16(45.71)</td>
<td>101(95.28)</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Online</td>
<td>19(54.29)</td>
<td>5(4.72)</td>
<td></td>
</tr>
<tr>
<td><strong>Eating Disorder Risk</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at risk</td>
<td>24(75.00)</td>
<td>67(64.42)</td>
<td></td>
</tr>
<tr>
<td>At risk</td>
<td>8(25.00)</td>
<td>37(35.48)</td>
<td>.2662</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>20.54(1.24)</td>
<td>19.55(1.42)</td>
<td>.0003*</td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td>23.42(3.96)</td>
<td>23.62(4.65)</td>
<td>.8293</td>
</tr>
<tr>
<td><strong>Intuitive Eating</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3.35(0.43)</td>
<td>3.25(0.47)</td>
<td>.2435</td>
</tr>
<tr>
<td>Unconditional permission to eat</td>
<td>2.99(0.77)</td>
<td>2.96(0.82)</td>
<td>.8266</td>
</tr>
<tr>
<td>Eating for physical rather than emotional reasons</td>
<td>3.43(0.75)</td>
<td>3.26(0.84)</td>
<td>.2883</td>
</tr>
<tr>
<td>Eating based on internal cues of hunger and fullness</td>
<td>3.49(0.63)</td>
<td>3.33(0.70)</td>
<td>.2444</td>
</tr>
<tr>
<td>Body-food Congruence</td>
<td>3.62(0.97)</td>
<td>3.65(0.82)</td>
<td>.8499</td>
</tr>
<tr>
<td><strong>Disordered Eating</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8.70(5.72)</td>
<td>13.89(12.07)</td>
<td>.0242*</td>
</tr>
<tr>
<td>Dieting</td>
<td>6.37(4.82)</td>
<td>9.27(8.35)</td>
<td>.0712</td>
</tr>
<tr>
<td>Bulimia &amp; Food Preoccupation</td>
<td>0.30(0.99)</td>
<td>1.63(3.05)</td>
<td>.0201*</td>
</tr>
<tr>
<td>Oral Control</td>
<td>2.03(1.97)</td>
<td>2.99(3.22)</td>
<td>.1252</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>45.16(17.56)</td>
<td>49.59(23.63)</td>
<td>.3359</td>
</tr>
<tr>
<td>Thin-ideal Internalization</td>
<td>3.16(1.10)</td>
<td>3.23(1.18)</td>
<td>.7723</td>
</tr>
<tr>
<td>Physical Activity (minutes/week)</td>
<td>472.62(233.57)</td>
<td>552.83(244.59)</td>
<td>.2113</td>
</tr>
</tbody>
</table>

*Significant at p<.05
aResults based on Fisher’s Exact Test
Table 3.2. Change in Outcome Measures by Intervention Status at Post-test

<table>
<thead>
<tr>
<th></th>
<th>Intervention (n=32)</th>
<th>Comparison (n=105)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intuitive Eating</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>0.34(0.52)</td>
<td>-0.03(0.44)</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Unconditional permission to eat</td>
<td>0.78(0.71)</td>
<td>0.01(0.55)</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Eating for physical rather than emotional reasons</td>
<td>0.02(0.76)</td>
<td>-0.16(0.77)</td>
<td>.2282</td>
</tr>
<tr>
<td>Eating based on internal cues of hunger and fullness</td>
<td>0.51(0.69)</td>
<td>0.14(0.70)</td>
<td>.0069*</td>
</tr>
<tr>
<td>Body-food Congruence</td>
<td>-0.01(0.99)</td>
<td>-0.10(0.91)</td>
<td>.6049</td>
</tr>
<tr>
<td><strong>Disordered Eating</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>0.72(12.20)</td>
<td>-0.82(9.06)</td>
<td>.4571</td>
</tr>
<tr>
<td>Dieting</td>
<td>-1.28(7.34)</td>
<td>-0.63(6.06)</td>
<td>.6266</td>
</tr>
<tr>
<td>Bulimia &amp; Food Preoccupation</td>
<td>1.80(3.25)</td>
<td>-0.01(2.15)</td>
<td>.0005*</td>
</tr>
<tr>
<td>Oral Control</td>
<td>0.23(3.79)</td>
<td>-0.19(2.63)</td>
<td>.4825</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>-0.90(19.69)</td>
<td>-1.04(14.72)</td>
<td>.9670</td>
</tr>
<tr>
<td>Thin-ideal Internalization</td>
<td>-0.28(0.80)</td>
<td>-0.12(0.75)</td>
<td>.3275</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>-44.62(228.44)</td>
<td>-112.35(223.82)</td>
<td>.2578</td>
</tr>
</tbody>
</table>
*Significant at p<.05
Table 3.3. Simple Linear Regression on Change in Outcomes at Post-test

<table>
<thead>
<tr>
<th></th>
<th>Intuitive Eating (n=137)</th>
<th>Body Dissatisfaction (n=134)</th>
<th>Thin Ideal Internalization (n=134)</th>
<th>Physical Activity (n=67)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β(s.e.) p-value</td>
<td>β(s.e.) p-value</td>
<td>β(s.e.) p-value</td>
<td>β(s.e.) p-value</td>
</tr>
<tr>
<td>Age</td>
<td>-0.02(0.03) .4764</td>
<td>-0.80(0.96) .4054</td>
<td>-0.08(0.05) .0741</td>
<td>14.65(18.62) .4344</td>
</tr>
<tr>
<td>BMI</td>
<td>0.00(0.01) .5852</td>
<td>-0.54(0.29) .0703</td>
<td>-0.02(0.02) .2232</td>
<td>-7.51(6.05) .2191</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.37(0.09) &lt;.0001*</td>
<td>0.14(3.27) .9670</td>
<td>-0.15(0.16) .3275</td>
<td>67.73(59.32) .2578</td>
</tr>
</tbody>
</table>

*Significant at p<.05

Table 3.4. Simple Linear Regression on Change in Intuitive Eating Subscales at Post-test (n=137)

<table>
<thead>
<tr>
<th></th>
<th>Unconditional permission to eat</th>
<th>Eating for physical rather than emotional reasons</th>
<th>Eating based on internal cues of hunger &amp; fullness</th>
<th>Body-food congruence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β(s.e.) p-value</td>
<td>β(s.e.) p-value</td>
<td>β(s.e.) p-value</td>
<td>β(s.e.) p-value</td>
</tr>
<tr>
<td>Age</td>
<td>-0.00(0.04) .9355</td>
<td>-0.02(0.05) .6727</td>
<td>-0.04(0.04) .2959</td>
<td>-0.01(0.05) .8340</td>
</tr>
<tr>
<td>BMI</td>
<td>-0.01(0.01) .2592</td>
<td>0.03(0.01) .0687</td>
<td>-0.01(0.01) .6550</td>
<td>0.01(0.02) .6344</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.77(0.12) &lt;.0001*</td>
<td>0.18(0.15) .2282</td>
<td>0.37(0.14) .0069*</td>
<td>0.09(0.18) .6049</td>
</tr>
</tbody>
</table>

*Significant at p<.05

Table 3.5. Simple Linear Regression on Change in EAT-26 at Post-test (n=132)

<table>
<thead>
<tr>
<th></th>
<th>Total Score</th>
<th>Dieting</th>
<th>Bulimia &amp; Food Preoccupation</th>
<th>Oral Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β(s.e.) p-value</td>
<td>β(s.e.) p-value</td>
<td>β(s.e.) p-value</td>
<td>β(s.e.) p-value</td>
</tr>
<tr>
<td>Age</td>
<td>0.74(0.59) .2087</td>
<td>0.29(0.38) .4453</td>
<td>0.18(0.15) .2396</td>
<td>0.28(0.17) .1110</td>
</tr>
<tr>
<td>BMI</td>
<td>0.01(0.13) .9284</td>
<td>-0.06(0.10) .5652</td>
<td>-0.05(0.04) .1447</td>
<td>0.13(0.05) .0067*</td>
</tr>
<tr>
<td>Intervention</td>
<td>1.54(2.06) .4571</td>
<td>-0.65(1.33) .6266</td>
<td>1.81(0.51) .0005*</td>
<td>0.43(0.61) .4825</td>
</tr>
</tbody>
</table>

*Significant at p<.05
Table 3.6. Adjusted Linear Regression on Change in Outcomes at Post-test

<table>
<thead>
<tr>
<th></th>
<th>Intuitive Eating (n=137)</th>
<th>Body Dissatisfaction (n=131)</th>
<th>Thin Ideal Internalization (n=131)</th>
<th>Physical Activity (n=66)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β(s.e.)</td>
<td>p-value</td>
<td>β(s.e.)</td>
<td>p-value</td>
</tr>
<tr>
<td>Age</td>
<td>-0.06(0.03)</td>
<td>.0238*</td>
<td>-1.02(0.94)</td>
<td>.2795</td>
</tr>
<tr>
<td>BMI</td>
<td>0.01(0.01)</td>
<td>.2215</td>
<td>-0.46(0.31)</td>
<td>.1368</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.44(0.09)</td>
<td>&lt;.0001*</td>
<td>-0.14(3.17)</td>
<td>.9639</td>
</tr>
</tbody>
</table>

*Significant at p<.05

Table 3.7. Adjusted Linear Regression on Change in Intuitive Eating Subscales at Post-test (n=137)

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Unconditional permission to eat</th>
<th>Eating for physical rather than emotional reasons</th>
<th>Eating based on internal cues of hunger &amp; fullness</th>
<th>Body-food congruence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β(s.e.)</td>
<td>p-value</td>
<td>β(s.e.)</td>
<td>p-value</td>
</tr>
<tr>
<td>Age</td>
<td>-0.07(0.04)</td>
<td>.6992</td>
<td>-0.07(0.05)</td>
<td>.1624</td>
</tr>
<tr>
<td>BMI</td>
<td>-0.01(0.01)</td>
<td>.4998</td>
<td>0.03(0.01)</td>
<td>.0327*</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.85(0.12)</td>
<td>&lt;.0001*</td>
<td>0.23(0.16)</td>
<td>.1606</td>
</tr>
</tbody>
</table>

*Significant at p<.05

Table 3.8. Adjusted Linear Regression on Change in EAT-26 at Post-test (n=129)

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Total Score</th>
<th>Dieting</th>
<th>Bulimia &amp; Food Preoccupation</th>
<th>Oral Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β(s.e.)</td>
<td>p-value</td>
<td>β(s.e.)</td>
<td>p-value</td>
</tr>
<tr>
<td>Age</td>
<td>0.19(0.42)</td>
<td>.6472</td>
<td>0.17(0.33)</td>
<td>.6092</td>
</tr>
<tr>
<td>BMI</td>
<td>-0.01(0.14)</td>
<td>.9536</td>
<td>-0.08(0.11)</td>
<td>.4325</td>
</tr>
<tr>
<td>Intervention</td>
<td>-1.29(1.48)</td>
<td>.3874</td>
<td>-2.12(1.16)</td>
<td>.0706</td>
</tr>
</tbody>
</table>

*Significant at p<.05
Table 3.9. Baseline Characteristics of Participants who Completed Baseline & Follow-up

<table>
<thead>
<tr>
<th></th>
<th>Intervention (n=35)</th>
<th>Comparison (n=95)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1(2.78)</td>
<td>10(10.53)</td>
<td>.2880*</td>
</tr>
<tr>
<td>Female</td>
<td>35(97.22)</td>
<td>85(89.47)</td>
<td>.</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>30(85.71)</td>
<td>86(90.53)</td>
<td>.4324</td>
</tr>
<tr>
<td>Non-white</td>
<td>5(14.29)</td>
<td>9(9.47)</td>
<td></td>
</tr>
<tr>
<td><strong>Year in College</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman/Sophomore</td>
<td>5(13.89)</td>
<td>70(73.68)</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Junior/Senior</td>
<td>31(86.11)</td>
<td>25(26.32)</td>
<td>.</td>
</tr>
<tr>
<td><strong>Course Delivery</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-class</td>
<td>12(33.33)</td>
<td>91(95.79)</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Online</td>
<td>24(66.67)</td>
<td>4(4.21)</td>
<td>.</td>
</tr>
<tr>
<td><strong>Eating Disorder Risk</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at risk</td>
<td>25(75.76)</td>
<td>61(64.21)</td>
<td>.</td>
</tr>
<tr>
<td>At risk</td>
<td>8(24.24)</td>
<td>34(35.79)</td>
<td>.2236</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>20.7±1.14</td>
<td>19.38±1.36</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td>24.2±4.77</td>
<td>23.2±4.11</td>
<td>.2753</td>
</tr>
<tr>
<td><strong>Intuitive Eating</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3.34±0.50</td>
<td>3.26±0.46</td>
<td>.3863</td>
</tr>
<tr>
<td>Unconditional permission to eat</td>
<td>3.11±0.82</td>
<td>2.89±0.79</td>
<td>.1653</td>
</tr>
<tr>
<td>Eating for physical rather than emotional reasons</td>
<td>3.41±0.87</td>
<td>3.34±0.81</td>
<td>.6801</td>
</tr>
<tr>
<td>Eating based on internal cues of hunger and fullness</td>
<td>3.44±0.70</td>
<td>3.32±0.70</td>
<td>.3935</td>
</tr>
<tr>
<td><strong>Body-food Congruence</strong></td>
<td>3.46±0.90</td>
<td>3.69±0.84</td>
<td>.1826</td>
</tr>
<tr>
<td><strong>Disordered Eating</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>11.53±10.14</td>
<td>13.95±11.85</td>
<td>.3174</td>
</tr>
<tr>
<td>Dieting</td>
<td>8.13±6.34</td>
<td>9.59±8.54</td>
<td>.3926</td>
</tr>
<tr>
<td>Bulimia &amp; Food Preoccupation</td>
<td>1.13±2.70</td>
<td>1.52±2.97</td>
<td>.5261</td>
</tr>
<tr>
<td>Oral Control</td>
<td>2.27±2.69</td>
<td>2.84±3.07</td>
<td>.3610</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>52.10±21.06</td>
<td>49.71±21.72</td>
<td>.5944</td>
</tr>
<tr>
<td>Thin-ideal Internalization</td>
<td>3.24±1.23</td>
<td>3.25±1.09</td>
<td>.9854</td>
</tr>
<tr>
<td>Physical Activity (minutes/week)</td>
<td>439.69±228.78</td>
<td>569.26±244.05</td>
<td>.0715</td>
</tr>
</tbody>
</table>

*Significant p<.05

*aResults based on Fisher’s Exact Test
Table 3.10. Change in Outcome Measures by Intervention Status at 3-month Follow-up

<table>
<thead>
<tr>
<th></th>
<th>Intervention (n=35)</th>
<th>Comparison (n=95)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intuitive Eating</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>0.22(0.51)</td>
<td>0.02(0.38)</td>
<td>.0172*</td>
</tr>
<tr>
<td>Unconditional permission to eat</td>
<td>0.44(0.76)</td>
<td>0.03(0.67)</td>
<td>.0029*</td>
</tr>
<tr>
<td>Eating for physical rather than emotional reasons</td>
<td>0.06(0.59)</td>
<td>-0.03(0.68)</td>
<td>.4859</td>
</tr>
<tr>
<td>Eating based on internal cues of hunger and fullness</td>
<td>0.40(0.77)</td>
<td>0.11(0.66)</td>
<td>.0341*</td>
</tr>
<tr>
<td>Body-food Congruence</td>
<td>-0.17(0.80)</td>
<td>-0.03(0.87)</td>
<td>.4197</td>
</tr>
<tr>
<td><strong>Disordered Eating</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>-0.77(12.08)</td>
<td>-0.05(10.31)</td>
<td>.7523</td>
</tr>
<tr>
<td>Dieting</td>
<td>-1.67(6.74)</td>
<td>-0.17(6.58)</td>
<td>.2833</td>
</tr>
<tr>
<td>Bulimia</td>
<td>0.13(3.69)</td>
<td>0.27(2.74)</td>
<td>.8332</td>
</tr>
<tr>
<td>Oral control</td>
<td>0.77(3.70)</td>
<td>-0.15(3.24)</td>
<td>.1956</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>-1.55(19.28)</td>
<td>0.92(12.50)</td>
<td>.4126</td>
</tr>
<tr>
<td>Thin-ideal Internalization</td>
<td>-0.27(0.71)</td>
<td>-0.07(0.73)</td>
<td>.1990</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>-15.63(285.71)</td>
<td>-133.88(258.71)</td>
<td>.1361</td>
</tr>
</tbody>
</table>

*Significant at p<.05
Table 3.11. Simple Linear Regression on Change in Outcomes at Follow-up

<table>
<thead>
<tr>
<th></th>
<th>Intuitive Eating (n=130)</th>
<th>Body Dissatisfaction (n=123)</th>
<th>Thin Ideal Internalization (n=122)</th>
<th>Physical Activity (n=58)</th>
</tr>
</thead>
<tbody>
<tr>
<td>β(s.e.)</td>
<td>p-value</td>
<td>β(s.e.)</td>
<td>p-value</td>
<td>β(s.e.)</td>
</tr>
<tr>
<td>Age</td>
<td>-0.03(0.03)</td>
<td>.2092</td>
<td>-0.53(0.93)</td>
<td>.5703</td>
</tr>
<tr>
<td>BMI</td>
<td>-0.01(0.01)</td>
<td>.4867</td>
<td>0.02(0.30)</td>
<td>.9379</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.20(0.08)</td>
<td>.0172*</td>
<td>-2.47(3.01)</td>
<td>.4126</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-0.20(0.15)</td>
<td>.1990</td>
</tr>
</tbody>
</table>

*Significant at p<.05

Table 3.12. Simple Linear Regression on Change in Intuitive Eating Subscales at Follow-up (n=130)

<table>
<thead>
<tr>
<th></th>
<th>Unconditional permission to eat</th>
<th>Eating for physical rather than emotional reasons</th>
<th>Eating based on internal cues of hunger &amp; fullness</th>
<th>Body-food congruence</th>
</tr>
</thead>
<tbody>
<tr>
<td>β(s.e.)</td>
<td>p-value</td>
<td>β(s.e.)</td>
<td>p-value</td>
<td>β(s.e.)</td>
</tr>
<tr>
<td>Age</td>
<td>0.05(0.04)</td>
<td>.2981</td>
<td>0.00(0.04)</td>
<td>.9701</td>
</tr>
<tr>
<td>BMI</td>
<td>-0.01(0.01)</td>
<td>.3768</td>
<td>0.01(0.01)</td>
<td>.3517</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.41(0.14)</td>
<td>.0029*</td>
<td>0.09(0.13)</td>
<td>.4859</td>
</tr>
</tbody>
</table>

*Significant at p<.05

Table 3.13. Simple Linear Regression on Change in EAT-26 at Follow-up (n=124)

<table>
<thead>
<tr>
<th></th>
<th>Total Score</th>
<th>Dieting</th>
<th>Bulimia &amp; Food Preoccupation</th>
<th>Oral Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>β(s.e.)</td>
<td>p-value</td>
<td>β(s.e.)</td>
<td>p-value</td>
<td>β(s.e.)</td>
</tr>
<tr>
<td>Age</td>
<td>0.51(0.68)</td>
<td>.4611</td>
<td>0.05(0.42)</td>
<td>.8978</td>
</tr>
<tr>
<td>BMI</td>
<td>0.24(0.22)</td>
<td>.2794</td>
<td>0.12(0.14)</td>
<td>.4009</td>
</tr>
<tr>
<td>Intervention</td>
<td>-0.71(2.26)</td>
<td>.7523</td>
<td>-1.50(1.39)</td>
<td>.2833</td>
</tr>
</tbody>
</table>

*Significant at p<.05
### Table 3.14. Adjusted Linear Regression on Change in Outcomes at Follow-up

<table>
<thead>
<tr>
<th></th>
<th>Intuitive Eating (n=130)</th>
<th>Body Dissatisfaction (n=122)</th>
<th>Thin Ideal Internalization (n=121)</th>
<th>Physical Activity (n=58)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β(s.e.)</td>
<td>p-value</td>
<td>β(s.e.)</td>
<td>p-value</td>
</tr>
<tr>
<td>Age</td>
<td>0.01(0.03)</td>
<td>.6778</td>
<td>-0.29(1.04)</td>
<td>.7795</td>
</tr>
<tr>
<td>BMI</td>
<td>-0.01(0.01)</td>
<td>.3267</td>
<td>0.06(0.31)</td>
<td>.8400</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.19(0.09)</td>
<td>.0443*</td>
<td>-2.20(3.37)</td>
<td>.5153</td>
</tr>
</tbody>
</table>

*Significant at p<.05

### Table 3.15. Adjusted Linear Regression on Change in Intuitive Eating Subscales at Follow-up (n=130)

<table>
<thead>
<tr>
<th></th>
<th>Unconditional permission to eat</th>
<th>Eating for physical rather than emotional reasons</th>
<th>Eating based on internal cues of hunger &amp; fullness</th>
<th>Body-food congruence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β(s.e.)</td>
<td>p-value</td>
<td>β(s.e.)</td>
<td>p-value</td>
</tr>
<tr>
<td>Age</td>
<td>-0.00(0.05)</td>
<td>.9902</td>
<td>-0.02(0.05)</td>
<td>.6762</td>
</tr>
<tr>
<td>BMI</td>
<td>-0.02(0.01)</td>
<td>.2430</td>
<td>0.01(0.01)</td>
<td>.3559</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.44(0.15)</td>
<td>.0042*</td>
<td>0.09(0.14)</td>
<td>.5449</td>
</tr>
</tbody>
</table>

*Significant at p<.05

### Table 3.16. Adjusted Linear Regression on Change in EAT-26 at Follow-up (n=123)

<table>
<thead>
<tr>
<th></th>
<th>Total Score</th>
<th>Dieting</th>
<th>Bulimia &amp; Food Preoccupation</th>
<th>Oral Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β(s.e.)</td>
<td>p-value</td>
<td>β(s.e.)</td>
<td>p-value</td>
</tr>
<tr>
<td>Age</td>
<td>0.62(0.77)</td>
<td>.4243</td>
<td>0.25(0.47)</td>
<td>.5992</td>
</tr>
<tr>
<td>BMI</td>
<td>0.23(0.23)</td>
<td>.3229</td>
<td>0.12(0.14)</td>
<td>.3933</td>
</tr>
<tr>
<td>Intervention</td>
<td>-1.89(2.53)</td>
<td>.4578</td>
<td>-1.79(1.56)</td>
<td>.2523</td>
</tr>
</tbody>
</table>

*Significant at p<.05
Table 3.17. Baseline Characteristics of Participants who Completed All 3 Time Points

<table>
<thead>
<tr>
<th></th>
<th>Intervention (n=23)</th>
<th>Comparison (n=73)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1(4.35)</td>
<td>6(7.89)</td>
<td>.6727a</td>
</tr>
<tr>
<td>Female</td>
<td>22(95.65)</td>
<td>70(92.11)</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>21(91.30)</td>
<td>67(91.78)</td>
<td>.9425a</td>
</tr>
<tr>
<td>Non-white</td>
<td>2(8.70)</td>
<td>6(8.22)</td>
<td></td>
</tr>
<tr>
<td>Year in College</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman/Sophomore</td>
<td>3(13.04)</td>
<td>52(71.23)</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Junior/Senior</td>
<td>20(86.96)</td>
<td>21(28.77)</td>
<td></td>
</tr>
<tr>
<td>Course Delivery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-class</td>
<td>9(39.13)</td>
<td>70(95.89)</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Online</td>
<td>14(60.87)</td>
<td>3(4.11)</td>
<td></td>
</tr>
<tr>
<td>Eating Disorder Risk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at risk</td>
<td>17(77.27)</td>
<td>48(65.75)</td>
<td></td>
</tr>
<tr>
<td>At risk</td>
<td>5(22.73)</td>
<td>25(34.25)</td>
<td>.3082</td>
</tr>
<tr>
<td>Age</td>
<td>20.78(1.13)</td>
<td>19.44(1.38)</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>BMI</td>
<td>23.04(3.73)</td>
<td>23.33(4.33)</td>
<td>.7775</td>
</tr>
<tr>
<td>Intuitive Eating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3.42(0.48)</td>
<td>3.24(0.48)</td>
<td>.1197</td>
</tr>
<tr>
<td>Unconditional permission to eat</td>
<td>3.21(0.79)</td>
<td>2.91(0.79)</td>
<td>.1149</td>
</tr>
<tr>
<td>Eating for physical rather than emotional reasons</td>
<td>3.46(0.84)</td>
<td>3.26(0.81)</td>
<td>.3141</td>
</tr>
<tr>
<td>Eating based on internal cues of hunger and fullness</td>
<td>3.57(0.64)</td>
<td>3.32(0.67)</td>
<td>.1291</td>
</tr>
<tr>
<td>Body-food Congruence</td>
<td>3.46(0.98)</td>
<td>3.70(0.82)</td>
<td>.2556</td>
</tr>
<tr>
<td>Disordered Eating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8.89(6.45)</td>
<td>14.33(11.45)</td>
<td>.0560</td>
</tr>
<tr>
<td>Dieting</td>
<td>6.56(5.44)</td>
<td>9.95(8.48)</td>
<td>.1103</td>
</tr>
<tr>
<td>Bulimia</td>
<td>0.39(1.20)</td>
<td>1.48(2.74)</td>
<td>.1040</td>
</tr>
<tr>
<td>Oral control</td>
<td>1.94(1.83)</td>
<td>2.90(3.17)</td>
<td>.2216</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>45.74(19.65)</td>
<td>50.85(22.28)</td>
<td>.3661</td>
</tr>
<tr>
<td>Thin-ideal Internalization</td>
<td>3.36(0.98)</td>
<td>3.32(1.14)</td>
<td>.8958</td>
</tr>
<tr>
<td>Physical Activity (minutes/week)</td>
<td>417.08(199.42)</td>
<td>531.50(226.71)</td>
<td>.1349</td>
</tr>
</tbody>
</table>

*Significant p<.05
*Results based on Fisher’s Exact Test
Table 3.18. Multivariable Linear Regression Assessing Change in Outcomes over Time

<table>
<thead>
<tr>
<th></th>
<th>Intuitive Eating</th>
<th>Body Dissatisfaction</th>
<th>Thin Ideal Internalization</th>
<th>Physical Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention</strong></td>
<td>β(0.10)</td>
<td>p-value</td>
<td>β(0.22)</td>
<td>p-value</td>
</tr>
<tr>
<td>Intervention</td>
<td>-0.08(0.10)</td>
<td>0.009</td>
<td>3.74(4.12)</td>
<td>0.15(0.22)</td>
</tr>
<tr>
<td>Time</td>
<td>0.00(0.02)</td>
<td>0.9504</td>
<td>0.37(0.67)</td>
<td>0.3582</td>
</tr>
<tr>
<td>Interaction of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention &amp; Time</td>
<td>0.12(0.04)</td>
<td>0.0036*</td>
<td>-1.34(1.38)</td>
<td>0.3309</td>
</tr>
<tr>
<td>BMI</td>
<td>-0.01(0.01)</td>
<td>0.0065*</td>
<td>1.21(0.22)</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Age</td>
<td>0.05(0.02)</td>
<td>0.0201*</td>
<td>0.41 (1.03)</td>
<td>0.6922</td>
</tr>
</tbody>
</table>

* Significant at p<.05

Table 3.19. Multivariable Linear Regression Assessing Change in Intuitive Eating Subscales over Time

<table>
<thead>
<tr>
<th></th>
<th>Unconditional permission to eat</th>
<th>Eating for physical rather than emotional reasons</th>
<th>Eating based on internal cues of hunger &amp; fullness</th>
<th>Body-food congruence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention</strong></td>
<td>β(0.15)</td>
<td>p-value</td>
<td>β(0.16)</td>
<td>p-value</td>
</tr>
<tr>
<td>Intervention</td>
<td>-0.24(0.15)</td>
<td>0.1150</td>
<td>-0.01(0.16)</td>
<td>0.9608</td>
</tr>
<tr>
<td>Time</td>
<td>0.00(0.03)</td>
<td>0.9245</td>
<td>-0.04(0.03)</td>
<td>0.2914</td>
</tr>
<tr>
<td>Interaction of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention &amp; Time</td>
<td>0.28(0.06)</td>
<td>&lt;.0001*</td>
<td>0.05(0.07)</td>
<td>0.4842</td>
</tr>
<tr>
<td>BMI</td>
<td>0.00(0.01)</td>
<td>0.9107</td>
<td>-0.03(0.01)</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Age</td>
<td>0.08(0.03)</td>
<td>0.0209*</td>
<td>0.05(0.03)</td>
<td>0.1820</td>
</tr>
</tbody>
</table>

* Significant at p<.05
Table 3.20. Multivariable Linear Regression Assessing Change in EAT-26 Total and Subscales over Time

<table>
<thead>
<tr>
<th></th>
<th>Total Score</th>
<th>Dieting</th>
<th>Bulimia &amp; Food Preoccupation</th>
<th>Oral Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β(s.e.)</td>
<td>p-value</td>
<td>β(s.e.)</td>
<td>p-value</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.75(2.31)</td>
<td>.7467</td>
<td>1.25(1.50)</td>
<td>.4046</td>
</tr>
<tr>
<td>Time</td>
<td>0.07(0.42)</td>
<td>.8705</td>
<td>-0.09(0.27)</td>
<td>.7402</td>
</tr>
<tr>
<td>Interaction of Intervention &amp; Time</td>
<td>-0.62(0.89)</td>
<td>.4822</td>
<td>-0.85(0.56)</td>
<td>.1273</td>
</tr>
<tr>
<td>BMI</td>
<td>0.01(0.16)</td>
<td>.9564</td>
<td>0.11(0.11)</td>
<td>.2905</td>
</tr>
<tr>
<td>Age</td>
<td>-0.19(0.53)</td>
<td>.7271</td>
<td>-0.39(0.36)</td>
<td>-0.2772</td>
</tr>
</tbody>
</table>

*Significant at p<.05
Figure 3.1 Change in Total Intuitive Eating

Figure 3.2 Change in Unconditional Permission to Eat

Figure 3.3 Change in Eating based on Internal Cues of Hunger and Fullness
Chapter 4

Specific Aim #2

Validation of an Instrument to Measure Registered Dietitian/Nutritionists’ Knowledge, Attitudes, and Practices of an Intuitive Eating Approach
Abstract

The traditional approach to weight management that promotes the restriction of food intake and a focus on body weight has achieved little long term success. The lack of effectiveness and adverse outcomes associated with this approach has triggered a paradigm shift in the weight management field. Research is growing in support of a health-centered, non-dieting approach termed intuitive eating. Intuitive eating is a style of eating that allows for unconditional permission to eat and encourages eating for physical reasons based on internal cues of hunger and fullness. Intuitive eating also promotes size acceptance and respect of the body regardless of weight. While research grows in favor of physical and psychological advantages of such an approach, the knowledge and attitudes regarding intuitive eating of registered dietitian/nutritionists (RD/Ns) in the U.S. remain unknown and there are no studies characterizing weight management strategies utilized by RD/Ns in the U.S. Globally, few studies have assessed the degree to which dietitians utilize certain weight management strategies and this was the first study to validate an instrument to do so. The purpose of this study was to develop and validate a tool to measure RD/Ns’ knowledge, attitudes, and practices regarding an intuitive eating lifestyle. The survey was distributed to a random sample of 10% of all RD/Ns in the U.S. (n=8,834). RD/Ns received an original e-mail requesting participation and two reminders. The survey remained open for two months, during which 22.19% of the RD/Ns completed the survey (n=1,897). Exploratory factor analysis was used to evaluate construct validity of the instrument. After removing items with insufficient factor loadings, the results were consistent with a four factor solution: knowledge of intuitive
eating, attitudes towards intuitive eating, traditional and restrictive practices, and non-restrictive and intuitive eating practices. Confirmatory factor analysis provided further evidence of the validity of the four factors and the factors had strong reliability. This instrument could provide valuable information regarding the current knowledge, attitudes, and practices of RD/Ns in the U.S.

Introduction

Weight-related issues affect the majority of the population in the United States (U.S.). The traditional approach to weight management is characterized by restriction of intake of calories, specific nutrients, or food groups in order to induce weight loss. This traditional, restrictive approach to weight loss, however, has achieved little long term success; few participants maintain any weight that was lost and many participants gain back more weight than was lost during the program. Due to the adverse outcomes and a lack of effectiveness, serious ethical consideration should be given to the recommendation of restrictive practices for weight loss.

As a result, some professionals have been calling for a paradigm shift in the weight management field. One emerging approach, intuitive eating encourages individuals to focus on health instead of weight loss. Intuitive eating is characterized by using internal cues of hunger and fullness to guide eating and emphasizes acceptance of the body regardless of size. Similar to intuitive eating, some professionals are encouraging mindful eating. Mindful eating has been described as the nonjudgmental awareness of the physical and emotional sensations associated with eating or
environment. Mindful eating encourages individuals to eat according to internal cues of hunger and satiety and to eat slowly, to taste every bite thoroughly, and eat without distraction. There is evidence that many dietitians may be moving away from the weight loss paradigm and towards a size acceptance, intuitive eating approach.

In an attempt to characterize weight management practices that Australian dietitians use with clients, Campbell & Crawford developed a questionnaire by compiling a list of common weight management practices from the literature that was then reviewed by dietitians with expertise in this area. Dietitians were asked how frequently they perform each weight management strategy with their clients (i.e. specific advice to reduce total fat intake). Barr and colleagues altered this questionnaire to include size acceptance philosophies (i.e. increasing self-acceptance of current weight) in their study to examine Canadian dietitians’ weight management attitudes and practices. While these surveys provide valuable insight into the attitudes and practices of dietitians, these studies are limited in that reliability and validity of surveys to assess these practices was not established.

While a valid and reliable measure exists to capture individuals’ intuitive eating behavior, no such measure exists to gauge health professionals’ knowledge, attitudes, and practices regarding this approach. To date, only qualitative research has examined dietitians’ knowledge of non-dieting and size acceptance approaches. As support for the intuitive eating approach grows, it is unknown to what degree RD/Ns are aware of and promote intuitive eating practices. Given the current divide in the weight management philosophies, it is also unknown how favorably RD/Ns view the intuitive
eating lifestyle. Before we can answer these questions, however, we must have valid and reliable tools to do so. The purpose of this study is to develop and validate a tool to measure RD/Ns’ knowledge, attitudes, and practices regarding an intuitive eating lifestyle.

Methods

Participants

The Commission on Dietetic Registration (CDR) provides a complementary list of contact information for RD/Ns in the U.S to students conducting research relevant to the dietetics practice. Upon approval of the research purpose and methods, this information was provided to the researcher. Ten percent of the RD/Ns were randomly selected to collect data for the initial validity (n=8,834). Of those selected, 284 did not provide an e-mail address and 163 e-mails failed to send for a final sample of 8,549 eligible RD/Ns recruited. From these, 1,897 RD/Ns completed the survey for a response rate of 22.19%. After initial revision of the survey, the instrument was distributed to the remaining 90% of the RD/Ns (n=79,950) to confirm validity.

Procedures

The development of the survey instrument underwent several phases. Phase I entailed the development of the original instrument. The researcher identified and adapted existing scales, as well as developed original questions to assess the knowledge,
attitudes, and practices of RD/Ns relevant to intuitive eating. In Phase II, the researcher consulted two other nutrition professionals, both familiar with the intuitive eating approach, to ensure content validity. Based on feedback, three negatively worded practice items were reworded positively to enhance clarity, one item (recommend using a food journal/diary to monitor calories, portions, etc.) was divided into two items to reflect two practices (recommend using a food journal/diary to monitor exact calories, portions, etc. & recommend using a food journal/diary to monitor general calories, portions, etc.), and a “don’t know” option was added to each of the three main sections. One of the RD/Ns consulted also noted that some RD/Ns may be familiar with the similar approach of mindful eating, but not intuitive eating specifically. Thus, the question “have you ever heard of intuitive eating?” was changed to “have you ever heard of intuitive or mindful eating?” to identify RD/Ns who have heard of either strategy. After these edits, an online version of the survey was created.

In Phase III, the instrument was sent to the dietetic interns at Kent State University to pilot test the survey. The researcher asked the interns to provide feedback to the researcher about anything that was unclear and to give suggestions to improve the face validity of the instrument. The interns indicated that the items were clear. There was one spelling error and one error in the layout of the online survey. After these corrections, the development of the instrument was complete.

All RD/Ns in the selected sample with a valid e-mail address received an e-mail requesting their participation in the survey. The e-mail asked the RD/Ns to follow a link to the survey website where they were first prompted to read and agree to informed
consent. The survey was open for two months during which the RD/Ns received the original e-mail and two reminders. All procedures were reviewed and approved by the Kent State University Institutional Review Board (IRB).

Measures

Descriptive Characteristics. Participants were asked to report their gender, age, race, highest level of education, main practice setting, state of practice, and if they had completed a certificate in pediatric or adult weight management. Participants were also asked if they have ever heard of intuitive or mindful eating and if they currently counsel overweight and/or obese clients for weight management; if they did, the number of years’ experience they have in this practice.

Practices. Those participants who reported that they do currently counsel overweight and/or obese clients for weight management completed this section. Participants were asked to report on a Likert scale (0=never, 1=rarely, 2=sometimes, 3=often, 4=usually) how often they use various practices when counseling overweight and/or obese clients. This section of the survey was adapted from a tool used by Barr and colleagues 148 to describe how often Canadian dietitians utilize several specific practices with their weight management clients.

Knowledge. All participants responded to this section. The first ten questions were adapted from the Intuitive Eating Scale-2 94 and describe behaviors that are and are not consistent with the intuitive eating lifestyle. Participants were asked to report if each statement was characteristic of an intuitive eater or if they do not know. The next four
questions assessed knowledge of evidence-based outcomes of intuitive eating. Response categories included true, false, or do not know.

**Attitudes.** All participants responded to this section. This section gauged the attitudes of RD/Ns towards various health behaviors and attitudes. These items were developed by the researcher. Items assessed attitudes towards key aspects of intuitive eating and towards the use of this approach and the traditional approach for weight management. Participants were asked to rate the degree to which they agree or disagree with each statement on a Likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). Nine items were consistent with and four items were inconsistent with the intuitive eating lifestyle.

**Data Analysis**

Since only RD/Ns who worked in weight management counseling completed the whole survey, data from this sample was used to conduct initial validity analysis. Construct validity was examined first with exploratory factor analysis (EFA) using principal axis factoring to extract factors by estimating the shared variance between items and oblique rotation of factors with promax rotation in order to allow the factors to be correlated. The correlation matrix was examined to ensure there was no singularity or multicollinearity. The sample size will be evaluated based on the ideal sample size to parameters ratio of 20:1 and sampling adequacy was assessed with the Kaiser-Myer Olkin (KMO) value. The communality values were assessed to assure there is shared variance between the items. The number of factors was determined by examining eigen...
values and the scree plot. Items with a factor loading of at least 0.35 and a cross-loading difference of at least 0.2 were retained to create the final instrument. After the instrument demonstrated initial validity, analysis was repeated using data from RD/Ns who do not work in weight management to ensure validity of the knowledge and attitudes factors in all RD/Ns.

Construct validity was further assessed using confirmatory factor analysis (CFA) with maximum likelihood estimation. Hu & Bentler\textsuperscript{164} have recommended several two-index strategies to assess fit, including one recommended combination of the standardized root-mean square residual (SRMR) with recommended value \( \leq 0.08 \) and the root mean square error of approximation (RMSEA) with recommended value \( \leq 0.06 \). Factor loadings were assessed to ensure each had a loading of at least 0.35. Cronbach’s alpha was calculated to assess reliability.

Results

Participants

Most participants were female (96.78%), non-Hispanic (96.20%), and Caucasian (91.03%; Table 4.1). Nearly 44% had a Bachelor’s degree while an additional 50.18% had completed a Master’s degree. Most worked in a clinical setting (40.90%) while others worked in a community (15.30%), research (6.02%), private practice (7.81%), or other settings (19.73%). Several were not practicing in a dietetics-related field (10.24%).
Roughly half of the respondents reported that they work in the weight management field (53.72%).

**Validity and Reliability**

The EFA with principal axis factoring and oblique rotation was conducted to assess construct validity. The correlation matrix was examined to ensure there was no singularity or multicollinearity. The sample size met the 20:1 sample size to parameters ratio. The overall KMO was 0.88; values ranged from 0.67 to 0.96, which indicated acceptable sampling adequacy. The communality values were assessed to assure there is shared variance between the items. The number of factors was determined by examining eigen values, the scree plot, and the factor solution. There were 5 eigen values greater than one. The scree plot inflection was between four and five (Figure 4.1). The five factor solution was examined first. Few items loaded on the fifth factor and of those that did, several cross-loaded with another factor. Thus, the 4 factor solution was examined. The overall KMO value (0.88) and the communality values were still adequate.

In this four factor solution, all of the knowledge items loaded strongly with each other and thus were retained. Five attitudes items (items 1, 6, 8, 9, and 11) were removed that did not load on any factor and three attitudes items (items 2, 5, and 7) that loaded with the practices items. The practice items were loading onto two distinct factors. Six practice items (items 4, 11, 12, 23, 24, 25) were removed that did not load at a value of at least 0.35 on any factor. When the EFA was conducted again without these items, only
two items were problematic. One practice item (item 10) did not load on the factor and one practice item (item 16) was cross-loading with two factors.

After removal of these two items, the results indicated 4 distinct factors with strong factor loadings (>0.35; Table 4.2) and no cross loading (difference >.20). The first factor consisted of fourteen items that represent knowledge of intuitive eating. The second factor consisted of seven items that represent attitudes toward intuitive eating. The third factor consisted of ten items that represent practices that are consistent with a non-restrictive, intuitive eating approach while the fourth factor consisted of seven items that represented practices that are consistent with a restrictive, traditional approach to weight management.

To further explore the validation of factors, the EFA was re-run in the complete sample (all RD/Ns, not just those who work in weight management), without the practices section of the survey to ensure that the knowledge and attitudes factors were valid in all RD/Ns, not just those who work in weight management. The factor structure for knowledge and attitudes was upheld.

Next, CFA was conducted to ensure validity of the factors. Data were used from 9,249 RD/Ns who completed the instrument distributed after the EFA was complete. The CFA model was specified with four factors. The RMSEA value was 0.07, close to the recommended value around 0.06 and less than the critical value of 0.10 that would have suggested poor fit. The SRMSR value was 0.07, indicating acceptable fit. All items loaded on their respective factor with a factor loading of at least 0.35 except for two attitudes items (How strongly do you support the use of intuitive eating to promote a
healthy lifestyle? and Intuitive eating is more effective than calorie-restricted dieting for long-term weight loss and/or maintenance). After these two items were removed, all items loaded on their respective factors with a loading for at least 0.35 (Table 4.3). The correlations between constructs were low (Table 4.3), indicating little overlap between factors.

Finally, Cronbach’s alpha was calculated to assess reliability of each factor (Table 4.3). The Cronbach’s alpha value for the traditional/restrictive practices factor was 0.74. The Cronbach’s alpha value for the non-restrictive/intuitive eating practices factor was 0.84. The Cronbach’s alpha value for the knowledge factor was 0.88 for those who work in weight management and 0.91 for the complete sample. The Cronbach’s alpha value for the attitudes factor was 0.75 for those who work in weight management and 0.79 for the complete sample. All values indicated adequate internal reliability of the factors.

Discussion

The results indicated that contrary to the hypothesized three factors, the proposed instrument actually measured four distinct factors: knowledge of intuitive eating, attitudes towards intuitive eating, use of restrictive and traditional weight management practices, and use of non-restrictive and intuitive eating practices. All 14 proposed knowledge items loaded strongly together. This factor measured RD/Ns’ knowledge of intuitive eating and the research regarding intuitive eating. These items were expected to load strongly together since most were adapted from a validated measure of intuitive eating behavior. While others have described dietitians’ understanding and use of
non-diet and size acceptance approaches to weight management, this is the first study to validate a quantitative measure of dietitians’ knowledge of an intuitive eating approach.

Of the original 11 attitudes items, five were removed after the EFA. Three of these items loaded with the practices items. After examination of these three items, it was apparent that the wording of these items assessed preference of a particular practice (i.e. *To lose weight, overweight and/or obese individuals should consciously restrict calories, fat, and/or carbohydrates*); thus, these items were removed since practices were assessed in another section. Two more items were removed as a result of the CFA. The five items that remained characterized RD/Ns’ attitudes regarding the use of intuitive eating with clients and the degree to which nutrition students and RD/Ns should be educated on and trained to use intuitive eating.

After eliminating practice items that did not load on any factor, the practices items loaded on two separate factors. Seven items loaded on one factor that included traditional and restrictive weight management practices that recommend limiting calories, nutrients, or eating in general or monitoring intake and/or weight. The other ten practices included strategies that do not directly imply restriction (i.e. work with clients using behavior modification techniques) and strategies that promote intuitive eating (i.e. recommend keeping a hunger awareness journal/diary).

One strength of this study is that it is the first study to validate a questionnaire to measure RD/Ns’ knowledge of and attitudes towards intuitive eating and various weight management practices. Previous studies have assessed dietitians’ attitudes towards
overweight and obesity but this was the first to develop a measure of attitudes towards intuitive eating, an approach that discourages a focus on weight. Similarly, researchers have looked at dietitians’ use of different weight management practices with clients using qualitative and quantitative methods. These studies have been limited in that reliability and validity were not established. As opposed to the hypothesized single practices factor, the results indicated that the given practices actually load onto two distinct factors, representing the two weight management paradigms. Measuring the two factors could prove to be more valuable in studying weight management practices among health professionals than clustering all practices together.

Another strength of this study was the large sample size. EFA demands a large sample size for accurate analysis. The provision of contact information by the CDR enabled the researcher to collect adequate data to be able to conduct this analysis.

Although the sample was large, overall response rate was relatively low. The survey was open for two months and each RD/N received the original request and two reminders. However, the survey was voluntary and no incentives were offered. Since those who responded self-selected to participate, results could be limited by selection bias. Those who chose to participate may differ from those who chose not to participate. Validation of this survey should be replicated in other RD/Ns and other health professionals to ensure accuracy.

In conclusion, this study developed and validated an instrument to measure RD/Ns knowledge of and attitudes towards intuitive eating, as well as traditional/restrictive and non-restrictive/intuitive eating practices. As it becomes more apparent that
the traditional, restrictive strategies to promote weight loss are ineffective and the support for an intuitive eating approach continues to grow, researchers have begun to discuss ethical issues associated with continuing to promote the use of traditional, restrictive practices for weight management. In particular, Aphramor has asserted that the ineffectiveness of the traditional energy deficit approach to weight management has not only failed to meet standards of evidence-based practice, but has failed to ignite a conversation about the ethical implications of continuing to use these practices and yet it continues to dominate research in the field. The tool developed and validated in this study could help spark such a debate, by examining the current state of practice, in the hopes of moving the field forward.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean(SD) or N(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>44.40(13.09)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>61(3.22)</td>
</tr>
<tr>
<td>Female</td>
<td>1,834(96.78)</td>
</tr>
<tr>
<td>Hispanic</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>72(3.80)</td>
</tr>
<tr>
<td>No</td>
<td>1,823(96.20)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>1,725(91.03)</td>
</tr>
<tr>
<td>African American</td>
<td>45(2.37)</td>
</tr>
<tr>
<td>Asian</td>
<td>64(3.38)</td>
</tr>
<tr>
<td>American Indian or Alaskan Native</td>
<td>8(0.42)</td>
</tr>
<tr>
<td>Native Hawaiian or Pacific Islander</td>
<td>5(0.26)</td>
</tr>
<tr>
<td>Other</td>
<td>48(2.53)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>826(43.59)</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>951(50.18)</td>
</tr>
<tr>
<td>Doctorate Degree</td>
<td>83(4.38)</td>
</tr>
<tr>
<td>Other</td>
<td>35(1.85)</td>
</tr>
<tr>
<td>Practice Setting</td>
<td></td>
</tr>
<tr>
<td>Clinical</td>
<td>775(40.90)</td>
</tr>
<tr>
<td>Community</td>
<td>290(15.30)</td>
</tr>
<tr>
<td>Research or academia</td>
<td>114(6.02)</td>
</tr>
<tr>
<td>Private Practice</td>
<td>148(7.81)</td>
</tr>
<tr>
<td>Industry</td>
<td>63(3.32)</td>
</tr>
<tr>
<td>Other</td>
<td>311(16.41)</td>
</tr>
<tr>
<td>Not currently practicing as a dietitian</td>
<td>194(10.24)</td>
</tr>
<tr>
<td>Completed Certificate of Training in Adult Weight Management</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>280(14.78)</td>
</tr>
<tr>
<td>No</td>
<td>1,615(85.22)</td>
</tr>
<tr>
<td>Completed Certificate of Training in Pediatric Weight Management</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>110(5.80)</td>
</tr>
<tr>
<td>No</td>
<td>1,785(94.20)</td>
</tr>
<tr>
<td>Currently Counsel Overweight and/or Obese Clients for Weight Management</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1,018(53.72)</td>
</tr>
<tr>
<td>No</td>
<td>877(46.28)</td>
</tr>
<tr>
<td></td>
<td>Knowledge of Intuitive Eating</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>An intuitive eater tries to avoid certain foods high in fat, carbohydrates, or calories.</td>
<td></td>
</tr>
<tr>
<td>An intuitive eater eats when feeling emotional (e.g., anxious, depressed, sad), even when not physically hungry.</td>
<td></td>
</tr>
<tr>
<td>If craving a certain food, an intuitive eater allows his/herself to have it.</td>
<td></td>
</tr>
<tr>
<td>An intuitive eater gets mad at his/herself for eating something unhealthy.</td>
<td></td>
</tr>
<tr>
<td>An intuitive eater is able to cope with negative emotions (e.g., anxiety, sadness) without turning to food for comfort.</td>
<td></td>
</tr>
<tr>
<td>An intuitive eater allows his/herself to eat what food is desired at the moment.</td>
<td></td>
</tr>
<tr>
<td>Most of the time, an intuitive eater desires to eat nutritious foods.</td>
<td></td>
</tr>
<tr>
<td>An intuitive eater mostly eats foods that make his/her body perform efficiently (well).</td>
<td></td>
</tr>
<tr>
<td>An intuitive eater relies on his/her hunger signals to tell him/her when to eat.</td>
<td></td>
</tr>
<tr>
<td>An intuitive eater relies on his/her fullness (satiety) signals to tell him/her when to stop eating.</td>
<td></td>
</tr>
<tr>
<td>Research has shown that intuitive eating is <em>positively associated</em> with a normal body mass index.</td>
<td></td>
</tr>
<tr>
<td>Research has shown that weight loss is <em>necessary</em> for overweight and/or obese individuals to improve their health.</td>
<td></td>
</tr>
<tr>
<td>Research has shown that intuitive eating is <em>positively associated</em> with psychological well-being (i.e. self-esteem, overall life satisfaction, and proactive coping skills).</td>
<td></td>
</tr>
<tr>
<td>Research has shown that intuitive eating is <em>inversely (negatively) associated</em> with disordered eating, body dissatisfaction, and internalization of the thin ideal.</td>
<td></td>
</tr>
<tr>
<td>How strongly do you support the use of intuitive eating to promote a healthy lifestyle?</td>
<td></td>
</tr>
<tr>
<td>Intuitive eating is more effective than calorie-restricted dieting for <em>long-term</em> weight loss and/or maintenance.</td>
<td></td>
</tr>
</tbody>
</table>
It is important for individuals to learn to eat based on internal cues of hunger, fullness, and satisfaction.  
It is important for individuals to choose foods that honor health and body function that also taste good.  
Intuitive eating is an adaptive style of eating.  
Students studying to become registered dietitians should be educated about intuitive eating.  
Registered dietitians should be trained to use intuitive eating for weight management.  
Give specific advice regarding opportunities for increasing incidental physical activity.  
Help clients find ways to be physically active that are enjoyable, rather than following a strict exercise regimen.  
Give advice regarding distribution of meals and snacks throughout the day.  
Give practical advice regarding shopping and cooking to achieve dietary goals.  
Help clients identify and eat foods that they enjoy and are nutritious.  
Work with clients using behavior modification techniques.  
Help clients learn to recognize and eat based on their internal signals of hunger, fullness, and satiety.  
Recommend keeping a hunger awareness journal/diary.  
Work with clients to increase self-esteem.  
Work with clients to increase self-acceptance of weight.  
Give specific advice to eat fewer calories.  
Give specific advice to reduce total fat intake.  
Advise clients to follow specific dieting plans that dictate what, when, and/or how much to eat.  
Encourage clients to avoid foods high in fat, carbohydrates, or calories.  
Recommend using a food journal/diary to monitor exact calories, portions, etc.  
Recommend keeping a weight journal/diary.  
Suggest that clients weigh themselves.
Table 4.3. Results of Confirmatory Factor Analysis Factor Loadings, Correlation between Factors, and Reliability Coefficients (n=9,249)

<table>
<thead>
<tr>
<th>Item</th>
<th>Estimate</th>
<th>Std Error</th>
<th>t-value</th>
<th>Inter-construct Correlations</th>
<th>Reliability*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Traditional/Restrictive Practices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e1</td>
<td>0.5372</td>
<td>0.0091</td>
<td>58.9090</td>
<td>1</td>
<td>0.74</td>
</tr>
<tr>
<td>e2</td>
<td>0.4689</td>
<td>0.0097</td>
<td>48.1311</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e3</td>
<td>0.3952</td>
<td>0.0103</td>
<td>38.2261</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e4</td>
<td>0.3854</td>
<td>0.0104</td>
<td>37.0180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e5</td>
<td>0.6381</td>
<td>0.0081</td>
<td>78.4890</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e6</td>
<td>0.6828</td>
<td>0.0077</td>
<td>88.7121</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e7</td>
<td>0.6009</td>
<td>0.0085</td>
<td>70.7143</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Non-restrictive/intuitive eating practices</td>
<td></td>
<td></td>
<td></td>
<td>0.1705</td>
<td>1</td>
</tr>
<tr>
<td>e8</td>
<td>0.4833</td>
<td>0.0088</td>
<td>54.8177</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>e9</td>
<td>0.6266</td>
<td>0.0072</td>
<td>86.6892</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e10</td>
<td>0.4258</td>
<td>0.0093</td>
<td>45.5618</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e11</td>
<td>0.5590</td>
<td>0.0080</td>
<td>69.6836</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e12</td>
<td>0.5990</td>
<td>0.0076</td>
<td>79.2048</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e13</td>
<td>0.6751</td>
<td>0.0066</td>
<td>102.1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e14</td>
<td>0.6736</td>
<td>0.0066</td>
<td>101.6000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e15</td>
<td>0.5753</td>
<td>0.0078</td>
<td>73.3805</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e16</td>
<td>0.6925</td>
<td>0.0064</td>
<td>108.5000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e17</td>
<td>0.6703</td>
<td>0.0067</td>
<td>100.4000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Knowledge</td>
<td></td>
<td></td>
<td></td>
<td>0.0955</td>
<td>-0.1517</td>
</tr>
<tr>
<td>e18</td>
<td>0.6261</td>
<td>0.0066</td>
<td>94.3466</td>
<td>-0.1517</td>
<td></td>
</tr>
<tr>
<td>e19</td>
<td>0.7618</td>
<td>0.0047</td>
<td>162.2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e20</td>
<td>0.6631</td>
<td>0.0061</td>
<td>107.9000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e21</td>
<td>0.7877</td>
<td>0.0043</td>
<td>183.7000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e22</td>
<td>0.7831</td>
<td>0.0044</td>
<td>179.6000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e23</td>
<td>0.5871</td>
<td>0.0071</td>
<td>82.3844</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e24</td>
<td>0.5103</td>
<td>0.0080</td>
<td>63.8065</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e25</td>
<td>0.6121</td>
<td>0.0068</td>
<td>89.8135</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e26</td>
<td>0.8901</td>
<td>0.0026</td>
<td>345.7000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e27</td>
<td>0.8919</td>
<td>0.0025</td>
<td>350.6000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e28</td>
<td>0.5598</td>
<td>0.0075</td>
<td>75.1526</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e29</td>
<td>0.4128</td>
<td>0.0089</td>
<td>46.2270</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e30</td>
<td>0.6810</td>
<td>0.0059</td>
<td>115.5000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e31</td>
<td>0.5298</td>
<td>0.0078</td>
<td>68.0328</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Attitudes</td>
<td></td>
<td></td>
<td></td>
<td>0.0963</td>
<td>-0.1491</td>
</tr>
<tr>
<td>e32</td>
<td>0.5453</td>
<td>0.0090</td>
<td>60.6524</td>
<td>-0.1491</td>
<td></td>
</tr>
<tr>
<td>e33</td>
<td>0.5678</td>
<td>0.0088</td>
<td>64.7045</td>
<td>-0.0545</td>
<td></td>
</tr>
<tr>
<td>e34</td>
<td>0.4465</td>
<td>0.0099</td>
<td>45.2337</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e35</td>
<td>0.7730</td>
<td>0.0071</td>
<td>109.3000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e36</td>
<td>0.6731</td>
<td>0.0078</td>
<td>86.1723</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Reliability values presented are Cronbach’s alpha values for RD/Ns who work in weight management.
Figure 4.1. Exploratory Factor Analysis Scree Plot of Eigen Values
Chapter 5

Specific Aim #3

U.S. Registered Dietitian/Nutritionists’ Knowledge and Attitudes of Intuitive Eating and Use of Various Weight Management Practices
Abstract

The traditional approach to weight management has achieved little success and caused adverse weight gain in many study participants. Recently, researchers have been advocating for a new paradigm that focuses on health rather than weight, known as intuitive eating. Even though the approach was founded by two registered dietitian/nutritionists (RD/Ns), RD/Ns knowledge of and attitudes towards this approach is unknown. The degree to which RD/Ns use intuitive eating strategies and/or still use traditional strategies is also unknown. The purpose of this study is to characterize RD/Ns’ knowledge of and attitudes towards an intuitive eating lifestyle and their use of traditional weight management and non-restrictive lifestyle practices with clients. The previously validated survey was distributed to 79,950 RD/Ns. The response rate was 24.72% (n=18,622). Results showed that most RD/Ns were knowledgeable about intuitive eating, answering about 71% of the items correctly. The majority of RD/Ns had a positive view on each of the attitudes items. Finally, among those who work in weight management, RD/Ns reported using non-restrictive/intuitive eating practices more than traditional/restrictive practices. RD/Ns who were women, had advanced education, worked in a private practice setting, completed at least one certificate of training in weight management, with more experience in weight management counseling, and with greater intuitive eating knowledge were more likely to have higher non-restrictive/intuitive eating practice scores. This study provides evidence that RD/Ns are shifting away from the traditional weight management paradigm and towards an intuitive
eating approach. More training in intuitive eating should be offered to RD/Ns and those studying to become RD/Ns.

Introduction

The National Health and Nutrition Examination Survey (NHANES) has been tracking the weight of Americans since 1960. At this time, the age-adjusted prevalence of obesity was 9.6% of adults; today, the prevalence has increased to 35.9% of adults. Since the prevalence began to rise, obesity has been regarded as a national public health priority in the U.S. As a result, several programs have attempted to induce weight loss in participants by restricting intake of calories or specific nutrients. This traditional approach to weight loss, however, has achieved little long term success; few participants maintain any weight that was lost and many participants gain back more weight than was lost during the program. Researchers are now raising attention to the serious ethical concern with recommending diets for weight loss due to long-term ineffectiveness and adverse effects.

Recently, support has been growing for an alternative approach known as intuitive eating. Intuitive eating is a non-restrictive approach that promotes health rather than weight loss, encourages eating based on internal cues of hunger and fullness, and emphasizes acceptance of the body regardless of weight. The approach was developed and endorsed by two RD/Ns in the late 1990s. These RD/Ns, who work in nutrition counseling, grew discouraged when overweight clients would lose weight by following a calorie-restricted diet but almost inevitably gain the weight back over time.
Through their counseling experience, they altered their practices and found great success with those clients who were able to adopt the intuitive eating lifestyle.

There is evidence that intuitive eating is associated with a lower Body Mass Index (BMI)\textsuperscript{91,94,105,106} and greater psychological well-being\textsuperscript{91,94} and inversely associated with eating disorder symptomatology.\textsuperscript{91,94} Others have demonstrated that participants in intuitive eating interventions generally lose\textsuperscript{111-118} or maintain\textsuperscript{119-126} body weight, increase body satisfaction,\textsuperscript{113,118,119,122,129-131} and improve cardiovascular risk irrespective of weight loss.\textsuperscript{120,127} However, research is limited and further studies are needed.\textsuperscript{136,159} The two approaches, the aforementioned traditional weight loss paradigm vs. the intuitive eating approach, reflect a divide in the literature on weight management.\textsuperscript{169}

As food and nutrition experts, RD/Ns play an important role in weight management. Researchers have attempted to characterize Australian,\textsuperscript{162} Canadian,\textsuperscript{148,161} and British\textsuperscript{165} dietitians’ use of specific practices regarding weight management with clients. There is evidence that while some maintain a focus on weight loss, many are moving toward the new paradigm that promotes health at every size.\textsuperscript{148,161} This transition, however, is limited; most dietitians have not fully adopted the size acceptance approach consistent with the intuitive eating lifestyle.\textsuperscript{148,161} For example, the degree to which dietitians have adopted the size acceptance approach may be relative to the clients’ weight (i.e. the majority agreed that all clients with a BMI $> 30$ kg/m$^2$ should be encouraged to lose weight while the minority agreed that all clients with a BMI $> 25$ kg/m$^2$ should be encouraged to lose weight).\textsuperscript{148} Another group of dietitians believed
weight loss should be a goal for obese clients with additional risk factors, but not for those without additional risk factors.\textsuperscript{161}

Previous research has also noted a divide within dietetics professionals;\textsuperscript{161,163} for example, some dietitians are passionate about a size acceptance approach with all clients, others worry that size acceptance would lead to complacency, compromising attempts to improve health.\textsuperscript{163} Further, while some dietitians believe that size acceptance and weight loss can co-occur as a treatment goal while others believe that size acceptance inherently involves removing the importance of weight or weight loss.\textsuperscript{163} In the U.S., RD/Ns’ attitudes regarding obesity have been assessed in the past;\textsuperscript{166,167} however, practices regarding weight management have not been assessed. Furthermore, globally, little research has been conducted to examine dietitians’ understanding of and attitudes towards a non-restrictive, size acceptance approach.\textsuperscript{163}

\textit{The Academy of Nutrition and Dietetics} (formerly the American Dietetic Association) urges RD/Ns to remain current the treatment and management of obesity. Most dietitians report that it is the role of the RD/N to help clients manage obesity and that they are the profession best trained to do so.\textsuperscript{148,162} Furthermore, since the majority of the population is overweight or obese,\textsuperscript{158} it is likely that RD/Ns will encounter weight management issues regardless of the setting they work in. While traditional restrictive weight management programs continue failing to produce long term results, it is unknown to what degree RD/Ns still promote these restrictive practices. Likewise, even though intuitive eating was initially developed by two RD/Ns, it is unknown to what degree other RD/Ns are aware of and promote intuitive eating practices. Thus, the
purpose of this study is to describe RD/Ns’ knowledge of and attitudes towards an intuitive eating lifestyle and assess RD/Ns’ use of traditional weight management and non-restrictive lifestyle practices with clients.

Methods

Participants

The Commission on Dietetic Registration (CDR) provides a complementary list of contact information for RD/Ns in the U.S to students conducting research relevant to the dietetics practice. Upon approval of the research purpose and methods, this information was provided to the researcher. Contact information for 88,834 RD/Ns in the U.S. were provided. A 10% random sample (n=8,834) of RD/Ns was selected to participate in the previous study in order to validate the instrument (see Chapter 4). Since no major changes were made to the instrument, data from these participants will be included in this study. The remaining 90% of RD/Ns (n=79,950) were invited to participate in this study. Of these, 2,857 did not provide an e-mail address and an additional 1,580 e-mails failed to send for a final sample of 76,912 RD/Ns. To estimate a more accurate denominator, the researcher requested that retired RD/Ns select the link to the survey and indicate their work status; 1577 RD/Ns self-identified as retired, thus, there were 75,335 RD/Ns eligible for the survey. Of these, 18,622 RD/Ns completed the survey for a response rate of 24.72%. No major changes were made to the survey after
initial validation, thus, all RD/Ns who responded to either wave were included in this analysis.

**Procedures**

All RD/Ns were sent an e-mail explaining the study and requesting their participation. The e-mail asked the RD/Ns to follow a link to the survey website where they were first prompted to read and agree to informed consent. The survey was open for three months during which each RD/N received the original e-mail and three reminders. All procedures were reviewed and approved by the Kent State University Institutional Review Board (IRB).

**Measures**

Knowledge, Attitudes, and Practices. An instrument was developed and validated in the previous study (see Chapter 4) to gauge RD/Ns’ knowledge of and attitudes towards intuitive eating and use of traditional/restrictive and non-restrictive practices with weight management clients. Knowledge of intuitive eating was measured with 14 true or false questions, including a “don’t know” option to each question. Attitudes towards intuitive eating were measured with seven items rated on a Likert scale (for the first item, 1=strongly do not support to 6= strongly support; for the remaining six items, 1=strongly disagree to 6=strongly agree). Each of these items also included a “don’t know” option to distinguish those who are not familiar with intuitive eating from those who have a neutral option regarding intuitive eating. To measure practices, participants
were asked how often they use each of 17 weight management strategies (1=never to 5=usually). Seven items were identified as restrictive/traditional weight management practices while ten items were identified as non-restrictive/intuitive eating strategies.

**Descriptive Characteristics.** Participants were asked to self-report gender, age, race, ethnicity, highest level of education completed, main practice setting, state in which they practice, if they have completed a certificate of training in weight management, and if they counsel overweight and/or obese clients for weight management.

**Data Analysis**

A mean age was calculated and frequencies of gender, race, highest education level, practice setting, and certification in adult or pediatric weight management described the sample. A pairwise deletion approach, or available case analysis, was taken in order to analyze all available data. Frequencies for each item were calculated to display RD/Ns’ knowledge of and attitudes towards intuitive eating and use of restrictive/traditional and non-restrictive/intuitive eating practices.

Researchers have argued that while Likert items are ordinal in nature, composite scores calculated from Likert scales can be treated as interval-level and parametric tests can be used to analyze such scores. Thus, total scores were calculated for each of the four factors. A total knowledge score was calculated by taking the sum of the 14 questions answered correctly from the knowledge section of the survey (range: 0-14). A total attitudes score was calculated by taking the sum of the five items with a higher score reflecting more positive attitudes towards the intuitive eating lifestyle (range: 5-25). Two
attitudes items did not load onto the factor in previous validation (see Chapter 4); thus, these two items will be used for descriptive purposes but not included in the total attitudes score. Any response reported as “don’t know” was regarded as a nonresponse. Participants who answered “don’t know” to at least one item would not have a total attitudes score. A total score was calculated for both restrictive/traditional (range: 7-35) and non-restrictive/intuitive eating (range: 10-50) practices.

Pearson’s correlations were conducted to examine the relationship between the total scores of the four factors. Then, total non-restrictive/intuitive eating scores were categorized into quartiles. Frequencies and means were described by quartile; then, chi-square analysis and analysis of variance (ANOVA) were conducted respectively for categorical and continuous variables to examine differences by quartile.

Results

Participants

Participants were mostly white, non-Hispanic, women (Table 5.1). More than half of the RD/Ns had at least a Master’s degree. Nearly 43% of all respondents reported they worked in a clinical setting and more than 87% had heard of mindful and/or intuitive eating. Just over 19% had completed at least one certificate of training in weight management. About half (50.29%) reported that they work in weight management; on average they had been working in weight management for about 14 years (mean=13.75; standard deviation [SD]=11.07).
Knowledge

Nearly 21,000 RD/Ns completed the knowledge of intuitive eating section of the questionnaire (Table 5.2). For 13 of the 14 questions, the majority of RD/Ns answered the questions correctly. For only one item the majority answered the question incorrectly; more than 51% reported it was true that research has shown that weight loss is necessary for overweight and/or obese people to improve their health. There was a large number of RD/Ns that reported they did not know the answer to the each of knowledge questions (n=2,218-5,719 for each item). More than 5,500 RD/Ns reported they did not know for the item research has shown that intuitive eating is positively associated with a normal body mass index. The largest number of RD/Ns reported they did not know (n=5,719) for the item research has shown that intuitive eating is inversely associated with disordered eating, body dissatisfaction, and internalization of the thin ideal.

Attitudes

The majority of RD/Ns reported a positive attitude toward all seven attitudes items (Table 5.3). Specifically, more than 70% reported that they support or strongly support the use of intuitive eating to promote a healthy lifestyle. More than 91% reported that they agree or strongly agree that it is important for individuals to learn to eat based on internal cues of hunger, fullness, and satisfaction. More than 92% reported that they agree or strongly agree that it is important for individuals to choose foods that honor health and body function that also taste good. About 70% reported they agree or strongly agree that intuitive eating is an adaptive style of eating. This item also had the largest
number of RD/Ns who reported they did not know (n=4,039). Nearly 87% reported that they agree or strongly agree that students studying to become RD/Ns should be educated about intuitive eating and nearly 79% reported that they agree or strongly agree that RD/Ns should be trained to use intuitive eating for weight management. More than 66% reported they agree or strongly agree that intuitive eating is more effective than calorie-restricted dieting for long-term weight loss and/or maintenance. This item had the second largest number of RD/Ns who reported they did not know (n=3,291).

**Practices**

Only RD/Ns who currently counsel clients for weight management answer the practices section of the questionnaire (n=10,841; Table 5.4). As indicated by the previous study, seven items in this section measured the use of traditional/restrictive practices while ten items measured the use of non-restrictive/intuitive eating practices. The majority of RD/Ns reported that they often or usually use only three of the seven traditional/restrictive practices (about 62% give specific advice to eat fewer calories; about 53% encourage clients to avoid foods high in fat, carbohydrates, or calories; about 59% recommend using a food journal/diary to monitor exact calories, portions, etc.). The majority of RD/Ns reported that they often or usually use most of the non-restrictive/intuitive eating practices. There were two exceptions; about 30% reported that they often or usually recommend keeping a hunger awareness diary/journal and less than 40% reported that they often or usually work with clients to increase self-acceptance of weight.
On average, RD/Ns answered about 69% of the 14 questions correctly (mean=9.95; SD=3.94; Table 5.5). Total knowledge score was positively correlated with attitudes towards intuitive eating and use of non-restrictive/intuitive eating practices (Table 5.5). These relationships were weak (r=0.03 and r=0.20 respectively; Table 5.5). Total knowledge score was negatively correlated with use of traditional/restrictive practices, but this relationship was negligible (r= -0.11; Table 5.5).

The total attitudes score revealed that RD/Ns generally had a positive attitude towards intuitive eating (mean=21.70; SD=2.54; Table 5.5). The distribution was negatively skewed, with more dietitians having a higher total attitudes score (median=21). Total attitudes score was positively correlated with knowledge of intuitive eating (r=0.03) and use of traditional/restrictive practices (r=0.05), but this relationship was negligible (Table 5.5). Total attitudes score was negatively correlated with non-restrictive/intuitive eating practices (r= -0.11), but this relationship was also weak (Table 5.5).

The mean total traditional/restrictive practices score was 23.13 (SD=4.95) while the mean total non-restrictive/intuitive eating practices score was 38.92 (SD=6.24). Total traditional/restrictive practices was negatively correlated with knowledge (r= -0.11) and positively correlated with attitudes (r=0.05), however, both of these relationships were negligible (Table 5.5). Non-restrictive/intuitive eating practices score was positively correlated with knowledge (r=0.20) and negatively correlated with attitudes (r= -0.11).
which was also negligible (Table 5.5). Traditional/restrictive practices and non-restrictive/intuitive eating practices were weakly correlated (r=0.29; Table 5.5).

**Descriptive Characteristics by Quartiles**

Total non-restrictive/intuitive eating score was divided into quartiles to examine differences between groups in total non-restrictive/intuitive eating practices (Table 5.6). A larger proportion of women were in the fourth quartile than men (p=<.0001). Post-hoc analysis revealed that women had significantly greater knowledge (mean=10.00, SD=3.91 for women; mean=8.52, SD=4.51 for men; p<.0001) than men but did not differ significantly in attitudes (mean=21.70, SD=2.54 for women; mean=21.51, SD=2.67 for men; p=.1710) scores than men. A larger proportion of those with higher education were also in the fourth quartile (p<.0001). Distribution of RD/Ns by practice setting were significantly different (p<.0001). Nearly half of all RD/Ns in private practice were in the fourth quartile. The lowest proportions of RD/Ns in the fourth quartile were in a clinical setting or not currently practicing as an RD/N. There were also significant differences by completion of certificate of training in weight management (p<.0001). Those who had completed one or more certificates had larger proportions of RD/Ns in the fourth quartile. As the years of experience in weight management counseling increased, so did the proportion of RD/Ns in the fourth quartile (p<.0001). Mean knowledge score increased with each increasing quartile (p<.0001). Attitudes scores for the first, second, and third quartiles were similar, while the attitudes score for the fourth quartile was slightly lower than the others (p<.0001).
Discussion

This study revealed that most U.S. RD/Ns have a good understanding of intuitive eating, a positive attitude towards intuitive eating, and use intuitive eating practices with clients fairly regularly. More than 87% had at least heard of mindful or intuitive eating, which suggested that these alternative approaches have become more widespread. On average, RD/Ns were able to answer almost three-quarters of the knowledge questions accurately. Likewise, the majority of RD/Ns reported a favorable stance on all of the items gauging attitude towards intuitive eating. Further, RD/Ns reported more frequent use of the non-restrictive, intuitive eating strategies rather than the traditional, restrictive strategies.

These results are consistent with others that have suggested that the weight management field has been experiencing a paradigm shift; RD/Ns reported using traditional and restrictive weight loss practices less frequently than non-restrictive and intuitive eating strategies. In one study, Canadian dietitians who participated in focus groups indicated that they often emphasize inclusion of all foods rather than restriction and many reported that they hesitate or even refuse to provide specific meal plans. In another study, Harvey and colleagues found that while British dietitians believed that physical inactivity was the most important cause of both overweight and obesity, repeated dieting was an important cause. Barr and colleagues found that the majority Canadian dietitians suggested that clients do not weigh themselves and most feel that dietitians should alter their focus from weight to other indicators of health. Likewise, Chapman and colleagues found that Canadian dietitians utilized a lifestyle approach.
that is not always consistent with recommendations that emphasize weight loss (i.e. the traditional approach to weight management).

There was only one knowledge item that the majority of RD/Ns did not answer correctly: research has shown that weight loss is necessary for overweight and/or obese individuals to improve their health. Interventions that apply an approach consistent with intuitive eating have shown that physical health, particularly markers of cardiovascular risk (i.e. blood pressure, cholesterol, triglycerides) can improve independent of weight loss. This is consistent with others who have found that dietitians do not always hold views consistent with the current evidence. The proportion of RD/Ns who did not answer this question accurately also provided evidence that most RD/Ns have not completely abandoned weight-centered strategies or fully embraced the intuitive eating approach, which is consistent with other findings.

Barr and colleagues found that while Canadian dietitians often try to help clients accept their current weight, most also agreed that all obese clients should be encouraged to lose weight and that it is the role of the dietitian to counsel obese clients for weight loss. Harvey and colleagues found that the more strongly dietitians agreed that overweight and obesity were caused by a lack of willpower, the more likely they were to use diet sheets and weight records with overweight clients and give advice about calorie-controlled intake and eating or avoiding specific foods with obese clients. In this study, the two non-restrictive/intuitive eating strategies that the majority of RD/Ns did not report using often or usually were how often do you recommend keeping a hunger awareness diary/journal and how often do you work with clients to increase self-
acceptance of weight. Identifying and eating based on hunger and self-acceptance of weight are two key elements of intuitive eating. The lower frequency of use of these strategies could reflect the notion that many RD/Ns have not fully embraced the intuitive eating approach.

Through a series of focus groups, Marchessault and colleagues found that dietitians had passionate opinions both for and against a size acceptance approach. Those who were opposed to the approach believed that acceptance of overweight or obesity would lead to complacency with lifestyle and compromise efforts to change. Others felt that a size acceptance approach offered hope to those who have struggled with weight loss in the past. For example, one dietitian expressed that if clients learn to accept and love themselves, they will start making healthier choices. The authors note that diverse opinions are expected whenever any field experiences a paradigm shift. In the current study, RD/Ns tended to have a positive attitude towards intuitive eating. In fact, the majority of RD/Ns reported a positive attitude toward all seven attitudes items assessed. The aforementioned study was published eight years ago; the current evidence may be indicative a growing acceptance of the intuitive eating approach.

The four factors were negligibly correlated with each other. The only correlation that borderline between weak and moderate was the correlation between traditional/restrictive practices and non-restrictive/intuitive eating practices. The positive relationship indicated that RD/Ns who use more traditional/restrictive practices also use more non-restrictive/intuitive eating practices. Other studies have indicated that dietitians often let clients set their own goals and individualize counseling plans. In another
study, few dietitians used a non-diet size acceptance approach with all clients; the majority agreed that they assess the patient’s circumstances before determining the appropriateness of this approach. Thus, the evidence that RD/Ns who are using non-restrictive/intuitive eating practices were also using more traditional/restrictive practices could reflect others’ findings that RD/Ns tailor their counseling strategies to the client. However, it is important to note that the majority of RD/Ns reported that they often or usually use only three of the seven traditional/restrictive practices while the majority of RD/Ns reported that they often or usually use most of the non-restrictive/intuitive eating practices; thus, non-restrictive/intuitive eating practices are utilized more often than traditional/restrictive practices.

When the total non-restrictive/intuitive eating scores were examined by quartile, there were several significant differences between groups. First, women had a larger proportion of RD/Ns in the fourth quartile than men. Post-hoc analysis revealed that women had higher knowledge than men but did not differ significantly in attitudes. Future studies should examine why women RD/Ns have greater knowledge, more positive attitudes, and use more non-restrictive/intuitive eating practices than men. Those with higher levels of education and certificates of training were more likely to be in the fourth quartile. One explanation could be that RD/Ns that more likely to seek additional education and training may also have been more likely to seek more education and training on alternative approaches to weight management. Those in private practice were also more likely to be in the further quartile. A private practice setting is less likely than
other settings to have standardized protocols; thus, RD/Ns in private practice may be more likely to use practices of their own choosing.

Additionally, the proportion of RD/Ns in the fourth quartile increased with increasing years of experience in weight management counseling. The RD/Ns who founded intuitive eating have expressed that with experience, they grew tired of the imminent failure of traditional/restrictive approach. Clients would initially lose weight, but eventually gain the weight back as restrictive practices were broken. Over time, these RD/Ns found success with those who adopted an intuitive eating approach. This could be one explanation for the increasing proportion of RD/Ns in the fourth quartile as years of experience increases.

Knowledge of intuitive eating increased with increasing quartiles. This is not surprising because RD/Ns who use intuitive eating practices are more likely to have greater knowledge about intuitive eating. One interesting finding was that a similar relationship for attitudes was not observed. RD/Ns in the first, second, and third quartiles had higher attitudes scores than those in the fourth quartile. One possible explanation for this finding is that many RD/Ns may have a positive attitude towards the different aspects of intuitive eating, but have received little or no education and/or training on this approach. Perhaps intuitive eating sounds promising, but without education and/or training, RD/Ns are not able to implement this approach with clients.

Currently, intuitive eating is not part of the required curriculum to become an RD/N. Notably, for each of the knowledge questions, there were several thousand RD/Ns who responded “don’t know.” Similarly, for the attitudes items, there were many RD/Ns
who responded “don’t know” for each item. Further, a majority of the RD/Ns agreed or strongly agreed that students studying to become RD/Ns should be educated about intuitive eating and that RD/Ns should be trained to use intuitive eating for weight management. This is consistent with evidence that dietitians may not receive sufficient training in weight management in general. In one study, dietitians were asked if their profession was effective in the management of overweight and obesity and results indicated that about an equal amount of dietitians agreed and disagreed with this statement. Another study showed that dietitians feel that their undergraduate training did not prepare them for weight management. In the current study, about half of the RD/Ns in this study who work in weight management reported that they completed at least a master’s degree; this could be reflect that undergraduate training is insufficient to prepare RD/Ns to work in weight management. More education and training should be provided to nutrition students and RD/Ns in order to advance the profession.

One strength of this study was the sample size. This is the largest number of RD/Ns to be included in a single study. In addition, coverage error was low. Coverage error is common in cross-sectional studies; however, in this study, the CDR provided the researcher with a complete list of RD/Ns in the U.S.

One limitation to this study was response rate. The survey was open for three months during which each RD/N received an original request and three reminders. Participation was completely voluntary and no incentives were offered for participation. Another limitation could be selection bias. Although this is the largest sample of RD/Ns included in a single study, the sample may not be representative of all U.S. RD/Ns and
the results may not be reflect the knowledge, attitudes, and practices of all RD/Ns. Additionally, several RD/Ns reported technical issues with the online survey software. In several cases, the participant contacted the researcher indicating the problem; the researcher then e-mailed the participant a new link to the survey, which solved the issue in each case. However, it is unknown how many RD/Ns tried to participate, experienced technical issues, and did not contact the researcher. This could have affected the response rate.

A third limitation was the content in the survey. Although the survey was validated to measure traditional/restrictive and non-restrictive/intuitive eating practices, the list of strategies is not exhaustive. RD/Ns may be employing strategies that were removed during factor analysis and/or strategies that were not included. Thus, this study may characterize RD/Ns’ use of the included practices but may not characterize all strategies used.

Another limitation is that it could be difficult for RD/Ns to generalize their use of specific practices. Dietitians have expressed the importance of having clients set their own goals and having individualized counseling plans. In another study, few dietitians used a non-diet size acceptance approach with all clients; the majority agreed that they assess the patient’s circumstances before determining the appropriateness of this approach. Thus, the frequency of using specific strategies may be dependent on the client and difficult to generalize.

In conclusion, this study provided evidence that many RD/Ns in the U.S. are knowledgeable about, have positive attitudes towards, and frequently use practices
consistent with intuitive eating. Future research should try to replicate these results in other RD/Ns to ensure that these results are representative of all RD/Ns in the U.S.

Finally, this study indicated that RD/Ns frequently use strategies consistent with intuitive eating with clients, yet there is little research that has been conducted using this approach. Since the dietetics field strives for evidence-based practice, more studies should be conducted on the health outcomes of intuitive eating, how to maximize adoption of this behavior in individuals, and if there are subpopulations of individuals who would benefit the most from intuitive eating.
Table 5.1. Descriptive Characteristics of Participants (n=22,542)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean(sd) or n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean(sd)</td>
<td>43.85(12.67)</td>
</tr>
<tr>
<td>Gender, n(%)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>666(2.96)</td>
</tr>
<tr>
<td>Female</td>
<td>21,863(97.04)</td>
</tr>
<tr>
<td>Ethnicity, n(%)</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>813(3.61)</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>21,729(96.39)</td>
</tr>
<tr>
<td>Race, n(%)</td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>20,494(90.91)</td>
</tr>
<tr>
<td>African-American</td>
<td>496(2.20)</td>
</tr>
<tr>
<td>Asian</td>
<td>826(3.66)</td>
</tr>
<tr>
<td>Other</td>
<td>726(3.22)</td>
</tr>
<tr>
<td>Highest Level of Education, n(%)</td>
<td></td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>10,129(44.93)</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>11,084(49.17)</td>
</tr>
<tr>
<td>Doctorate Degree</td>
<td>954(4.23)</td>
</tr>
<tr>
<td>Other</td>
<td>375(1.66)</td>
</tr>
<tr>
<td>Main Practice Setting, n(%)</td>
<td></td>
</tr>
<tr>
<td>Clinical</td>
<td>9,641(42.77)</td>
</tr>
<tr>
<td>Community</td>
<td>3,287(14.58)</td>
</tr>
<tr>
<td>Research or academia</td>
<td>1,366(6.06)</td>
</tr>
<tr>
<td>Private practice</td>
<td>1,471(6.53)</td>
</tr>
<tr>
<td>Industry</td>
<td>744(3.30)</td>
</tr>
<tr>
<td>Other</td>
<td>3,231(14.33)</td>
</tr>
<tr>
<td>Not currently practicing as an RD/N</td>
<td>2,802(12.43)</td>
</tr>
<tr>
<td>Completed the Certificate of Training in Adult Weight Management, n(%)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2,537(12.29)</td>
</tr>
<tr>
<td>Completed the Certificate of Training in Childhood and Adolescent Management, n(%)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>845(4.09)</td>
</tr>
<tr>
<td>Completed the Certificate of Training in Level 2 Adult Weight Management, n(%)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>84(0.41)</td>
</tr>
<tr>
<td>Completed More than 1 Certificate of Training in Management, n(%)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>459(2.22)</td>
</tr>
<tr>
<td>Counsel Overweight and/or Obese Clients for Weight Management, n(%)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>10,318(49.97)</td>
</tr>
<tr>
<td>Years of Experience Counseling Overweight and/or Obese Clients, n(%)</td>
<td></td>
</tr>
<tr>
<td>0.0 – 5.0 years</td>
<td>3,577(33.00)</td>
</tr>
<tr>
<td>5.1 – 10.0 years</td>
<td>1,962(18.10)</td>
</tr>
<tr>
<td>10.1 – 15.0 years</td>
<td>1,371(12.65)</td>
</tr>
<tr>
<td>15.1 – 20.0 years</td>
<td>1,183(10.91)</td>
</tr>
<tr>
<td>20.1 or greater</td>
<td>2,748(25.35)</td>
</tr>
<tr>
<td>Have Heard of Intuitive or Mindful Eating, n(%)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>17,325(87.04)</td>
</tr>
</tbody>
</table>

<sup>a</sup>Item was altered after validation; therefore, n reflects only the second distribution of the survey (see Methods)
Table 5.2. RD/Ns’ Knowledge of Intuitive Eating (n=20,870)$^a$

<table>
<thead>
<tr>
<th>Statement</th>
<th>True</th>
<th>False</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. An intuitive eater tries to avoid certain foods high in fat, carbohydrates, or calories.</td>
<td>3,603(17.26)</td>
<td>13,564(64.99)</td>
<td>3,703(17.74)</td>
</tr>
<tr>
<td>2. An intuitive eater eats when feeling emotional (e.g., anxious, depressed, sad), even when not physically hungry.</td>
<td>1,427(6.84)</td>
<td>16,529(79.20)</td>
<td>2,914(13.96)</td>
</tr>
<tr>
<td>3. If craving a certain food, an intuitive eater allows his/herself to have it.</td>
<td>15,957(76.46)</td>
<td>1,641(7.86)</td>
<td>3,272(15.68)</td>
</tr>
<tr>
<td>4. An intuitive eater gets mad at his/herself for eating something unhealthy.</td>
<td>1,118(5.36)</td>
<td>16,651(79.78)</td>
<td>3,101(14.86)</td>
</tr>
<tr>
<td>5. An intuitive eater is able to cope with negative emotions (e.g., anxiety, sadness) without turning to food for comfort.</td>
<td>16,704(80.04)</td>
<td>1,152(5.52)</td>
<td>3,014(14.44)</td>
</tr>
<tr>
<td>6. An intuitive eater allows his/herself to eat what food is desired at the moment.</td>
<td>13,749(65.88)</td>
<td>3,192(15.29)</td>
<td>3,929(18.83)</td>
</tr>
<tr>
<td>7. Most of the time, an intuitive eater desires to eat nutritious foods.</td>
<td>13,527(64.82)</td>
<td>2,171(10.40)</td>
<td>5,172(24.78)</td>
</tr>
<tr>
<td>8. An intuitive eater mostly eats foods that make his/her body perform efficiently (well).</td>
<td>18,100(86.73)</td>
<td>509(2.44)</td>
<td>2,261(10.83)</td>
</tr>
<tr>
<td>9. An intuitive eater relies on his/her hunger signals to tell him/her when to eat.</td>
<td>18,054(86.51)</td>
<td>598(2.87)</td>
<td>2,218(10.63)</td>
</tr>
<tr>
<td>10. An intuitive eater relies on his/her fullness (satiety) signals to tell him/her when to stop eating.</td>
<td>14,803(70.93)</td>
<td>562(2.69)</td>
<td>5,505(26.38)</td>
</tr>
<tr>
<td>11. Research has shown that intuitive eating is positively associated with a normal body mass index.</td>
<td>10,717(51.35)</td>
<td>7,121(34.12)</td>
<td>3,032(14.53)</td>
</tr>
<tr>
<td>12. Research has shown that weight loss is necessary for overweight and/or obese individuals to improve their health.</td>
<td>16,478(78.96)</td>
<td>269(1.29)</td>
<td>4,123(19.76)</td>
</tr>
<tr>
<td>13. Research has shown that intuitive eating is positively associated with psychological well-being (i.e. self-esteem, overall life satisfaction, and proactive coping skills).</td>
<td>11,186(53.60)</td>
<td>3,965(19.00)</td>
<td>5,719(27.40)</td>
</tr>
</tbody>
</table>

$^a$Correct answers are presented in bold
Table 5.3. RD/Ns’ Attitudes Towards Intuitive Eating, n(%) (n=20,513)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Do Not Support</th>
<th>Do Not Support</th>
<th>Neutral</th>
<th>Support</th>
<th>Strongly Support</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>How strongly do you support the use of intuitive eating to promote a healthy lifestyle? a</td>
<td>33 (0.16)</td>
<td>130 (0.63)</td>
<td>2,610 (12.73)</td>
<td>7,579 (36.97)</td>
<td>7,515 (36.65)</td>
<td>2,636 (12.86)</td>
</tr>
<tr>
<td>It is important for individuals to learn to eat based on internal cues of hunger, fullness, and satisfaction.</td>
<td>194 (0.95)</td>
<td>109 (0.53)</td>
<td>533 (2.60)</td>
<td>7,153 (34.87)</td>
<td>11,676 (56.92)</td>
<td>848 (4.13)</td>
</tr>
<tr>
<td>It is important for individuals to choose foods that honor health and body function that also taste good.</td>
<td>193 (0.94)</td>
<td>47 (0.23)</td>
<td>425 (2.07)</td>
<td>6,822 (33.26)</td>
<td>12,132 (59.15)</td>
<td>891 (4.34)</td>
</tr>
<tr>
<td>Intuitive eating is an adaptive style of eating.</td>
<td>123 (0.60)</td>
<td>256 (1.25)</td>
<td>1,736 (8.46)</td>
<td>8,406 (40.98)</td>
<td>5,950 (29.01)</td>
<td>4,039 (19.69)</td>
</tr>
<tr>
<td>Intuitive eating is more effective than calorie-restricted dieting for long-term weight loss and/or maintenance. a</td>
<td>93 (0.45)</td>
<td>506 (2.47)</td>
<td>2,950 (14.38)</td>
<td>7,968 (38.84)</td>
<td>5,705 (27.81)</td>
<td>3,291 (16.04)</td>
</tr>
<tr>
<td>Students studying to become registered dietitians should be educated about intuitive eating.</td>
<td>141 (0.69)</td>
<td>59 (0.29)</td>
<td>998 (4.87)</td>
<td>7,647 (37.28)</td>
<td>10,139 (49.43)</td>
<td>1,528 (7.45)</td>
</tr>
<tr>
<td>Registered dietitians should be trained to use intuitive eating for weight management.</td>
<td>127 (0.62)</td>
<td>136 (0.66)</td>
<td>2,104 (10.26)</td>
<td>7,458 (36.36)</td>
<td>8,662 (42.23)</td>
<td>2,025 (9.87)</td>
</tr>
</tbody>
</table>

aIndicates items not included in total attitudes score
### Table 5.4. RD/Ns’ Reported Frequency of use of Restrictive/Traditional & Non-restrictive/Intuitive Eating Practices (n=10,841)

<table>
<thead>
<tr>
<th>Practice</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Usually</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Traditional/restrictive practices</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Give specific advice to eat fewer calories?</td>
<td>289</td>
<td>962</td>
<td>2,965</td>
<td>3,447</td>
<td>3,178</td>
</tr>
<tr>
<td>(2.67)</td>
<td>(8.87)</td>
<td>(27.35)</td>
<td>(31.80)</td>
<td>(29.31)</td>
<td></td>
</tr>
<tr>
<td>Give specific advice to reduce total fat intake?</td>
<td>364</td>
<td>1,515</td>
<td>4,024</td>
<td>3,081</td>
<td>1,857</td>
</tr>
<tr>
<td>(3.36)</td>
<td>(13.97)</td>
<td>(37.12)</td>
<td>(28.42)</td>
<td>(17.13)</td>
<td></td>
</tr>
<tr>
<td>Advise clients to follow specific dieting plans that dictate what, when, and/or how much to eat?</td>
<td>1,660</td>
<td>3,643</td>
<td>3,156</td>
<td>1,504</td>
<td>878</td>
</tr>
<tr>
<td>(15.31)</td>
<td>(33.60)</td>
<td>(29.11)</td>
<td>(13.87)</td>
<td>(8.10)</td>
<td></td>
</tr>
<tr>
<td>Encourage clients to avoid foods high in fat, carbohydrates, or calories.</td>
<td>464</td>
<td>1,274</td>
<td>3,342</td>
<td>3,420</td>
<td>2,341</td>
</tr>
<tr>
<td>(4.28)</td>
<td>(11.75)</td>
<td>(30.83)</td>
<td>(31.55)</td>
<td>(21.59)</td>
<td></td>
</tr>
<tr>
<td>Recommend using a food journal/diary to monitor <em>exact</em> calories, portions, etc.?</td>
<td>467</td>
<td>1,221</td>
<td>2,777</td>
<td>3,380</td>
<td>2,996</td>
</tr>
<tr>
<td>(4.31)</td>
<td>(11.26)</td>
<td>(25.62)</td>
<td>(31.18)</td>
<td>(27.64)</td>
<td></td>
</tr>
<tr>
<td>Recommend keeping a weight journal/diary?</td>
<td>1,380</td>
<td>2,101</td>
<td>2,897</td>
<td>2,415</td>
<td>2,048</td>
</tr>
<tr>
<td>(12.73)</td>
<td>(19.38)</td>
<td>(26.72)</td>
<td>(22.58)</td>
<td>(18.89)</td>
<td></td>
</tr>
<tr>
<td>Suggest that clients weigh themselves?</td>
<td>1,393</td>
<td>2,576</td>
<td>3,550</td>
<td>2,055</td>
<td>1,267</td>
</tr>
<tr>
<td>(12.85)</td>
<td>(23.76)</td>
<td>(32.75)</td>
<td>(18.96)</td>
<td>(11.69)</td>
<td></td>
</tr>
<tr>
<td><strong>Non-restrictive/intuitive eating practices</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Give specific advice regarding opportunities for increasing incidental physical activity?</td>
<td>128</td>
<td>492</td>
<td>2,098</td>
<td>4,208</td>
<td>3,915</td>
</tr>
<tr>
<td>(1.18)</td>
<td>(4.54)</td>
<td>(19.35)</td>
<td>(38.82)</td>
<td>(36.11)</td>
<td></td>
</tr>
<tr>
<td>Help clients find ways to be physically active that are enjoyable, rather than following a strict exercise regimen?</td>
<td>75</td>
<td>346</td>
<td>1,368</td>
<td>3,800</td>
<td>5,252</td>
</tr>
<tr>
<td>(0.69)</td>
<td>(3.19)</td>
<td>(12.62)</td>
<td>(35.05)</td>
<td>(48.45)</td>
<td></td>
</tr>
<tr>
<td>Give advice regarding distribution of meals and snacks throughout the day?</td>
<td>24</td>
<td>150</td>
<td>1,227</td>
<td>4,053</td>
<td>5,387</td>
</tr>
<tr>
<td>(0.22)</td>
<td>(1.38)</td>
<td>(11.32)</td>
<td>(37.39)</td>
<td>(49.69)</td>
<td></td>
</tr>
<tr>
<td>Give practical advice regarding shopping and cooking to achieve dietary goals?</td>
<td>67</td>
<td>255</td>
<td>1,480</td>
<td>4,125</td>
<td>4,914</td>
</tr>
<tr>
<td>(0.62)</td>
<td>(2.35)</td>
<td>(13.65)</td>
<td>(38.05)</td>
<td>(45.33)</td>
<td></td>
</tr>
<tr>
<td>Help clients identify and eat foods that they enjoy <em>and</em> are nutritious?</td>
<td>15</td>
<td>98</td>
<td>722</td>
<td>3,633</td>
<td>6,373</td>
</tr>
<tr>
<td>(0.14)</td>
<td>(0.90)</td>
<td>(6.66)</td>
<td>(33.51)</td>
<td>(58.79)</td>
<td></td>
</tr>
<tr>
<td>Work with clients using behavior modification techniques?</td>
<td>153</td>
<td>614</td>
<td>2,122</td>
<td>3,703</td>
<td>4,249</td>
</tr>
<tr>
<td>(1.41)</td>
<td>(5.66)</td>
<td>(19.57)</td>
<td>(34.16)</td>
<td>(39.19)</td>
<td></td>
</tr>
<tr>
<td>Help clients learn to recognize and eat based on their internal signals of hunger, fullness, and satiety?</td>
<td>148</td>
<td>705</td>
<td>2,451</td>
<td>3,918</td>
<td>3,619</td>
</tr>
<tr>
<td>(1.37)</td>
<td>(6.50)</td>
<td>(22.61)</td>
<td>(36.14)</td>
<td>(33.38)</td>
<td></td>
</tr>
<tr>
<td>Recommend keeping a hunger awareness journal/diary?</td>
<td>1,704</td>
<td>2,786</td>
<td>3,087</td>
<td>2,101</td>
<td>1,163</td>
</tr>
<tr>
<td>(15.72)</td>
<td>(25.70)</td>
<td>(28.48)</td>
<td>(19.38)</td>
<td>(10.73)</td>
<td></td>
</tr>
<tr>
<td>Work with clients to increase self-esteem?</td>
<td>731</td>
<td>1,578</td>
<td>2,825</td>
<td>3,073</td>
<td>2,634</td>
</tr>
<tr>
<td>(6.74)</td>
<td>(14.56)</td>
<td>(26.06)</td>
<td>(28.35)</td>
<td>(24.30)</td>
<td></td>
</tr>
<tr>
<td>Work with clients to increase self-acceptance of weight?</td>
<td>847</td>
<td>2,112</td>
<td>3,561</td>
<td>2,673</td>
<td>1,648</td>
</tr>
<tr>
<td>(7.81)</td>
<td>(19.48)</td>
<td>(32.85)</td>
<td>(24.66)</td>
<td>(15.20)</td>
<td></td>
</tr>
</tbody>
</table>
Table 5.5. Average Total Scores and Correlations between Total Scores

<table>
<thead>
<tr>
<th>Factor</th>
<th>Mean(sd)</th>
<th>Factor Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Knowledge of Intuitive eating</td>
<td>9.95(3.94)</td>
<td>1</td>
</tr>
<tr>
<td>2. Attitudes towards Intuitive eating</td>
<td>21.70(2.54)</td>
<td>0.0339</td>
</tr>
<tr>
<td>3. Non-restrictive/intuitive eating practices</td>
<td>38.92(6.24)</td>
<td>0.1954 -0.1093 1</td>
</tr>
<tr>
<td>4. Traditional/restrictive practices</td>
<td>23.13(4.95)</td>
<td>-0.1076 0.0467 0.2906 1</td>
</tr>
</tbody>
</table>
Table 5.6. Characteristics by Quartiles of Total Non-restrictive/Intuitive Eating Practices

<table>
<thead>
<tr>
<th></th>
<th>1st Quartile</th>
<th>2nd Quartile</th>
<th>3rd Quartile</th>
<th>4th Quartile</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender, n(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>94(30.42)</td>
<td>81(26.21)</td>
<td>84(27.18)</td>
<td>50(16.67)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>2,362(22.44)</td>
<td>2,347(22.30)</td>
<td>3,098(29.43)</td>
<td>2,720(25.84)</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Ethnicity, n(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>96(22.17)</td>
<td>95(21.94)</td>
<td>133(30.72)</td>
<td>109(25.17)</td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>2,362(22.69)</td>
<td>2,333(22.42)</td>
<td>3,051(29.31)</td>
<td>2,662(25.58)</td>
<td>.9409</td>
</tr>
<tr>
<td>Race, n(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>2,212(22.58)</td>
<td>2,195(22.42)</td>
<td>2,866(29.26)</td>
<td>2,522(25.75)</td>
<td></td>
</tr>
<tr>
<td>African-American</td>
<td>59(23.60)</td>
<td>57(22.80)</td>
<td>71(28.40)</td>
<td>63(25.20)</td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>95(22.57)</td>
<td>92(21.85)</td>
<td>135(32.07)</td>
<td>99(23.52)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>92(24.60)</td>
<td>83(22.19)</td>
<td>112(29.95)</td>
<td>87(32.26)</td>
<td>.9334</td>
</tr>
<tr>
<td>Highest Level of Education, n(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>1,294(24.95)</td>
<td>1,202(23.18)</td>
<td>1,506(29.04)</td>
<td>1,184(22.83)</td>
<td></td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>1,086(20.78)</td>
<td>1,124(21.51)</td>
<td>1,558(28.91)</td>
<td>1,458(27.90)</td>
<td></td>
</tr>
<tr>
<td>Doctorate Degree</td>
<td>44(17.74)</td>
<td>51(20.56)</td>
<td>74(29.84)</td>
<td>79(31.85)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>34(18.78)</td>
<td>51(28.18)</td>
<td>46(25.41)</td>
<td>50(27.62)</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Main Practice Setting, n(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical</td>
<td>1,601(27.06)</td>
<td>1,408(23.80)</td>
<td>1,707(28.85)</td>
<td>1,201(20.30)</td>
<td></td>
</tr>
<tr>
<td>Community</td>
<td>434(22.95)</td>
<td>463(24.48)</td>
<td>546(28.87)</td>
<td>448(23.69)</td>
<td></td>
</tr>
<tr>
<td>Research or academia</td>
<td>58(18.30)</td>
<td>64(20.19)</td>
<td>105(33.12)</td>
<td>90(28.39)</td>
<td></td>
</tr>
<tr>
<td>Private practice</td>
<td>91(7.50)</td>
<td>172(14.17)</td>
<td>375(30.89)</td>
<td>576(47.45)</td>
<td></td>
</tr>
<tr>
<td>Industry</td>
<td>19(11.52)</td>
<td>47(28.48)</td>
<td>48(29.09)</td>
<td>51(30.91)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>234(18.71)</td>
<td>249(19.90)</td>
<td>378(30.22)</td>
<td>390(31.18)</td>
<td></td>
</tr>
<tr>
<td>Not currently practicing as an RD/N</td>
<td>21(24.42)</td>
<td>25(29.07)</td>
<td>22(27.50)</td>
<td>15(17.44)</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Completed the Certificate of Training, n(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult Weight Management</td>
<td>239(15.37)</td>
<td>340(21.86)</td>
<td>477(30.68)</td>
<td>499(32.09)</td>
<td></td>
</tr>
<tr>
<td>Childhood and Adolescent Weight Management</td>
<td>73(15.18)</td>
<td>106(22.04)</td>
<td>155(32.22)</td>
<td>147(30.56)</td>
<td></td>
</tr>
<tr>
<td>Level 2 Adult Weight Management</td>
<td>8(14.04)</td>
<td>11(19.30)</td>
<td>23(40.35)</td>
<td>15(26.32)</td>
<td></td>
</tr>
<tr>
<td>More than 1 of the above</td>
<td>36(11.54)</td>
<td>59(18.91)</td>
<td>106(33.97)</td>
<td>111(35.58)</td>
<td></td>
</tr>
<tr>
<td>None of the above</td>
<td>1,867(25.17)</td>
<td>1,692(22.81)</td>
<td>2,119(28.57)</td>
<td>1,740(23.46)</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Years of Experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Counseling Overweight and/or Obese Clients, n(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0 – 5.0 years</td>
<td>963(26.92)</td>
<td>848(23.71)</td>
<td>1,014(28.35)</td>
<td>752(21.02)</td>
<td></td>
</tr>
<tr>
<td>5.1 – 10.0 years</td>
<td>472(24.06)</td>
<td>426(21.71)</td>
<td>577(29.41)</td>
<td>487(24.82)</td>
<td></td>
</tr>
<tr>
<td>10.1 – 15.0 years</td>
<td>285(20.79)</td>
<td>329(24.00)</td>
<td>426(31.07)</td>
<td>331(24.14)</td>
<td></td>
</tr>
<tr>
<td>15.1 – 20.0 years</td>
<td>247(20.88)</td>
<td>253(21.39)</td>
<td>327(27.64)</td>
<td>356(30.09)</td>
<td></td>
</tr>
<tr>
<td>20.1 or greater</td>
<td>491(17.87)</td>
<td>572(20.82)</td>
<td>840(30.57)</td>
<td>845(30.75)</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Knowledge of Intuitive Eating, mean(sd)</td>
<td>9.35(4.15)</td>
<td>10.18(3.56)</td>
<td>10.64(3.32)</td>
<td>11.20(2.91)</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Attitudes towards Intuitive Eating, mean(sd)</td>
<td>22.00(2.59)</td>
<td>21.99(2.47)</td>
<td>21.75(2.20)</td>
<td>21.30(2.18)</td>
<td>&lt;.0001*</td>
</tr>
</tbody>
</table>

*Significant at p<.01
Chapter 6

Conclusions

The majority of the U.S. population struggles with at least one weight- or eating-related issue. Overweight and obesity is common among adults, college students, and adolescents and children. Likewise, several adults and adolescents suffer from clinical and sub-threshold eating disorders. Similarly, unhealthy weight control behaviors such as fasting, taking diet pills, and purging (i.e. self-induced vomiting) are common in adolescents and college students. In fact, these weight- and eating-related issues often overlap; overweight and obesity commonly co-occur with eating disorders and/or unhealthy weight control behaviors. Thus, in an attempt to increase success of weight-related programs and reach a larger number of people at once, researchers have suggested integrating overweight/obesity interventions with eating disorder interventions by addressing a series of shared risk factors. These include factors such as dieting, body dissatisfaction, media exposure, thin-ideal internalization.

Others have noted that the abundant literature on eating behavior has been vastly dominated by a focus on pathology by focusing on the reduction of risk factors and maladaptive behaviors. However, it has been argued that an absence or reduction of risk factors and maladaptive behaviors may not necessarily be the equivalent of healthy attitudes and behaviors. Thus, investigators in the field are calling for research on
positive body image and adaptive eating habits. \textsuperscript{89-92} One such approach that has been identified as an adaptive lifestyle is known as intuitive eating. \textsuperscript{93} Intuitive eating is an adaptive style of eating marked by a strong connection with internal physiological cues to eat and a healthy relationship with food. \textsuperscript{93}

The overarching purpose of this dissertation was to expand the research on the promotion of intuitive eating and describe the state of practice regarding intuitive eating in RD/Ns in the U.S. These goals were accomplished through three specific aims. The first aim was to examine the effects of a 16-week curriculum-based lifestyle intervention on health behavior outcomes (intuitive eating, physical activity, disordered eating, body dissatisfaction, and thin-ideal internalization) in college students.

This elective college course was offered both in-class and online for two semesters. Students listened to lectures, read articles, participated in discussion, and completed assignments all designed to help students decrease shared risk factors and increase intuitive eating. Results from this study demonstrate that a college curriculum intervention is effective for increasing overall intuitive eating and two particular aspects of intuitive eating including unconditional permission to eat and eating based on internal cues. The results regarding disordered eating, body dissatisfaction, and thin-ideal internalization were less promising.

Similar studies observed more promising results regarding disordered eating, body dissatisfaction, and thin-ideal internalization. \textsuperscript{85-87} These studies, however, had a much higher rate of participation in their surveys than the current study. All students enrolled in each of these studies in the intervention courses agreed to complete the
surveys while at least 75% of the students enrolled in the comparison courses agreed to participate in the two studies that included a comparison group. In the current study, only 47.2% of the students enrolled in the intervention completed the survey at baseline and 16.6% of the students completed the survey at all three time points. Similarly, only 30% of the students enrolled in the comparison course completed the survey at baseline and 13.1% completed the survey at all three time points.

Unlike the previous studies in which students were asked to complete the surveys in class, this survey was explained in class but then conducted online. The less personal approach may have led some students to neglect the importance of the survey. On the other hand, it is possible that when the survey was delivered in person, students may have felt compelled to participate or could have answered in a desired manner. Future studies should utilize an approach that emphasizes the importance of completing the surveys without coercing students to participate.

The current results are also limited in generalizability. The sample was predominantly female. Most studies that promote eating based on internal cues include only women even though there is evidence to suggest that men are less likely to diet and thus, may respond better to an intuitive eating approach. Men struggle with weight-related issues as much, if not more, than women. For example, the combined rate of overweight and obesity is higher in men than women. Males have recently experienced a 53% increase in hospitalizations for eating disorders. In one cohort study, male adolescents reported recurrent purging more than adolescent females. Unhealthy weight control behaviors have also been documented in college men. Future
studies should attempt to recruit more male participants to investigate if intuitive eating interventions could benefit males.

Most participants were also not at risk for developing an eating disorder. Previous research has demonstrated that eating disorder prevention programs that target high risk populations are more effective. Future research should investigate if programs that address shared risk factors are also more effective in targeted populations. In this study, although most were not at risk of developing an eating disorder, the intervention group still significantly increased intuitive eating. This could suggest that intuitive eating interventions can promote a healthy, adaptive lifestyle in those who struggle with eating as well as those who do not.

Despite these limitations, this study demonstrated that a college curriculum is a promising venue for promoting intuitive eating in young adults. Intuitive eating has been identified as an adaptive style of eating characterized by a strong connection with internal physiological cues to eat and a healthy relationship with food. Intuitive eating is associated with a healthy Body Mass Index (BMI), lower eating disorder symptomatology, body dissatisfaction, pressure for thinness, thin-ideal internalization, body surveillance, body shame, and poor interoceptive awareness, and greater psychological well-being, as demonstrated by optimism, proactive coping, body appreciation, self-esteem, and overall life satisfaction. The college setting provides accessibility to a large number of young adults where weight- and eating-related issues are common. Future studies should continue to investigate the promotion of intuitive eating and adaptive eating and weight attitudes in this population.
The second aim of this dissertation was to develop a valid and reliable instrument to measure the knowledge, attitudes, and practices regarding intuitive eating among registered dietitian/nutritionists (RD/Ns). As support for the intuitive eating approach grows, it is unknown to what degree RD/Ns are aware of and promote intuitive eating practices. Given the current divide in the weight management philosophies (traditional vs. intuitive eating), it is also unknown how favorably RD/Ns view the intuitive eating lifestyle. With the validation of this survey, these gaps in the literature can now be examined. Previous researchers have characterized weight management practices that dietitians use with clients. While these surveys provide valuable insight into the frequency of practices of dietitians, these studies are limited in that reliability and validity of surveys to assess these practices was not established. While a valid and reliable measure exists to capture individuals’ intuitive eating behavior, no such measure existed to gauge health professionals’ knowledge, attitudes, and practices regarding this approach prior to this study.

To achieve the aim of this study, a survey was designed to capture RD/Ns’ knowledge of intuitive eating, attitudes towards intuitive eating, and frequency of use of various weight management practices. The survey was distributed via e-mail to 10% of all RD/Ns in the U.S. (n=8,834), of which 22.19% completed the survey (n=1897).

EFA revealed that the questionnaire represented four factors: knowledge of intuitive eating, attitudes towards intuitive eating, traditional/restrictive weight management practices, and non-restrictive/intuitive eating weight management practices. CFA provided further evidence of the validity of the four factors and Cronbach’s alpha.
values demonstrated that the factors were reliable. The knowledge factor gauges RD/Ns’ knowledge of the intuitive eating lifestyle as well as the current evidence regarding intuitive eating. The attitudes factor gauges RD/Ns’ support of the use of various aspects of intuitive eating as well as their opinion on training for RD/Ns and nutrition students on intuitive eating. Contrary to the hypothesized single practices factor, traditional/restrictive practices loaded on one factor while non-restrictive/intuitive eating practices loaded on another. These two factors can be used to gauge how frequently RD/Ns who work in weight management use practices from the traditional weight loss paradigm as well as practices that are non-restrictive and consistent with the intuitive eating approach.

Future studies should replicate these results by validating this instrument in other nutrition and health professionals. Research should also be conducted utilizing this instrument to describe RD/Ns understanding and use of intuitive eating. As the divide in the weight management field continues to grow (traditional/restrictive vs. non-restrictive/intuitive eating), information collected using this instrument could provide valuable insight into the state of practice. Describing the state of practice could also be used to inform future research.

The final aim of this dissertation was to describe the knowledge, attitudes, and professional practices regarding the intuitive eating lifestyle and describe the relationship between these factors in registered dietitian/nutritionists (RD/Ns). Since the prevalence began to rise, several interventions have attempted to induce weight loss in participants by restricting intake of calories or specific nutrients. This traditional, restrictive approach
to weight loss is rarely effective long-term and often results in adverse effects.\textsuperscript{51-55} As experts begin to raise ethical concern with recommending the restrictive approach to weight loss,\textsuperscript{53,132} support grows for intuitive eating, a non-restrictive approach that promotes health rather than weight loss. Although the approach was developed and endorsed by two RD/Ns in the late 1990s, prior to this study, RD/Ns’ knowledge, attitudes and practices regarding intuitive eating were unknown.

To achieve this aim, the survey that was validated in the previous study was distributed to the 90\% of RD/Ns in the U.S. (n=79,950) who were not solicited to participate in the previous study. After excluding those who were ineligible, 24.72\% of the RD/Ns completed the survey (n=18,622). On average, RD/Ns answered about 71\% of the knowledge questions correctly. For each question, the majority of RD/Ns answered correctly with the exception of one item (research has shown that weight loss is necessary for overweight and/or obese people to improve their health). In addition, there were many RD/Ns who reported “don’t know” for all of the knowledge questions. The most RD/Ns reported “don’t know” for the questions that assessed knowledge of the research regarding intuitive eating. These results demonstrate that there are many RD/Ns that are knowledgeable about intuitive eating. However, more education could be provided to keep RD/Ns current on the evidence.

Overall, RD/Ns had a positive attitude towards intuitive eating. In fact, the majority of RD/Ns reported a positive attitude towards each of the seven items in this section. Nearly 87\% reported that they agree or strongly agree that students studying to become RD/Ns should be educated about intuitive eating and nearly 79\% reported that
they agree or strongly agree that RD/Ns should be trained to use intuitive eating for weight management. Furthermore, there were several hundred to several thousand RD/Ns who answered “don’t know” for all of the attitudes items. This evidence, in combination with the findings of the knowledge section, demonstrates that RD/Ns would benefit from and would be open to education and training regarding intuitive eating.

Roughly half of the RD/Ns who completed the survey reported that they work in weight management. These RD/Ns were asked to complete the practices section of the survey that gauged frequency of use of traditional/restrictive practices and non-restrictive/intuitive eating practices. The majority of RD/Ns reported that they often or usually use only three of the seven traditional/restrictive practices while the majority of RD/Ns reported that they often or usually use eight of the 10 non-restrictive/intuitive eating practices.

To further investigate RD/Ns’ use of non-restrictive/intuitive eating practices, total scores for this factor were divided into quartiles. From this analysis, there is evidence that RD/Ns who are women, work in private practice, seek additional training, had more years of experience in weight management, and were more knowledgeable about intuitive eating were more likely to be in the highest quartile. Somewhat surprising, the attitudes scores for the first, second, and third quartiles were similar, while the attitudes score for the fourth quartile was slightly lower than the others. This could indicate that RD/Ns may have a favorable attitude towards intuitive eating, but may not have the training or skills to implement it in practice.
Future research should try to replicate these results in other RD/Ns to ensure that these results are representative of all RD/Ns in the U.S. and to investigate whether other health professionals are also adopting this approach. This evidence all suggests an instance of practice informing research; it is evident that several RD/Ns are utilizing this approach and yet research on intuitive eating is limited. Since the dietetics field strives for evidence-based practice, more studies should be conducted on the health outcomes of intuitive eating, how to maximize adoption of this behavior in individuals, and if there are subpopulations of individuals who would benefit the most from intuitive eating.

Currently, intuitive eating is not part of the required curriculum to become an RD/N. In other studies, dietitians have expressed that they do not receive sufficient training in weight management in general. As research continues to emerge in support of an intuitive eating approach, the Accreditation Council for Education in Nutrition and Dietetics (ACEND) of the Academy of Nutrition and Dietetics should consider incorporating more weight management education and training, including intuitive eating, into the Didactic Program in Dietetics.

As food and nutrition experts, RD/Ns should be the profession best equipped to counsel weight-related issues and most dietitians believe this is true. The Academy, relevant practice groups, and other institutes that support this approach could provide more educational opportunities in the form of seminars, webinars, and retreats. RD/Ns should also be encouraged to stay current on the literature and seek training to enhance the value of the profession as well as the health outcomes for all those that RD/Ns are able to reach.
Chapter 7

Appendices
Appendix A. Conceptual Model

Curriculum-based Intervention:
- Lectures
- Readings
- Quizzes
- Class activities
- Class discussion
- Homework assignments
- Presentation
- Final Exam

Gender
Race

Risk of developing an eating disorder

BMI
Age
Year in college

Intuitive Eating
Disordered Eating:
Body dissatisfaction
Thin-ideal internalization
Physical activity

Time
Delivery mode
### Appendix B. Behavior Change Techniques Applied in the Intervention

<table>
<thead>
<tr>
<th>Activity</th>
<th>Theory, Construct, or Strategy</th>
<th>Behavior or Attitude Impacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures and readings</td>
<td>Psycho-education</td>
<td>Intuitive eating, disordered eating, body dissatisfaction, thin-ideal internalization, physical activity</td>
</tr>
</tbody>
</table>
| Write an opinion-editorial article about dieting | Cognitive dissonance | Intuitive Eating  
- Total  
- Unconditional permission to eat  
Disordered Eating |
| Try to eat based on internal cues for a day; keep a food diary and identify hunger/fullness level using hunger ruler | Self-efficacy  
Self-monitoring | Intuitive Eating  
- Total  
- Eating according to internal cues |
| Identify benefits and barriers to eating based on hunger and fullness; identify strategies to overcome barriers | Health Belief Model | Intuitive Eating  
- Total  
- Eating according to internal cues |
| Mindful eating exercise using piece of candy | Self-efficacy | Intuitive Eating  
- Total  
- Eating according to internal cues |
| Practice mindful eating strategies for a day | Self-efficacy | Intuitive Eating  
- Total  
- Eating according to internal cues |
| Identify benefits and barriers to mindful eating; identify strategies to overcome barriers | Health Belief Model | Intuitive Eating  
- Total  
- Eating according to internal cues |
| Write an opinion-editorial article about “the food police” | Cognitive dissonance | Intuitive Eating  
- Total  
- Unconditional permission to eat |
| Monitor “food police” thoughts for a day; identify the consequence of having this thought and come up with an intuitive eater thought to replace it | Self-monitoring  
Cognitive behavior theory | Intuitive Eating  
- Total  
- Unconditional permission to eat |
| Write an opinion-editorial article about external and emotional triggers to eat | Cognitive dissonance | Intuitive Eating  
- Total  
- Eating for physical rather than emotional reasons |
<table>
<thead>
<tr>
<th>Activity</th>
<th>Domain</th>
<th>Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record any external and emotional triggers to eat for a day; try to come up with an alternative activity rather than eating as a response to that trigger if appropriate</td>
<td>Self-monitoring</td>
<td>Intuitive Eating</td>
</tr>
<tr>
<td>View &amp; discuss Jean Kilbournes’ “Killing Us Softly 4” documentary</td>
<td>Media literacy</td>
<td>Body dissatisfaction, Thin ideal internalization</td>
</tr>
<tr>
<td>Identify an advertisement from a magazine or the internet. Write a short essay about its hidden positive or negative messages, stereotypes, effects on women and men in society, messages sent to young girls and boys, etc. using material/information from “Killing Us Softly 4”</td>
<td>Media literacy, Self-efficacy</td>
<td>Body dissatisfaction, Thin ideal internalization</td>
</tr>
<tr>
<td>Using the Renfrew Center Foundation’s handout “Do I Contribute to Another’s Eating Disorder?” identify how each statement contributes to eating disorders; then come up with at least one more thing you or your friends do or say that could contribute to eating disorders</td>
<td>Cognitive behavior theory</td>
<td>Disordered eating, Body dissatisfaction, Thin-ideal internalization</td>
</tr>
<tr>
<td>Magazine Project: compile and revise op-ed articles and create advertisements that encourage body appreciation</td>
<td>Cognitive Dissonance</td>
<td>Intuitive Eating</td>
</tr>
<tr>
<td>Role play common situations regarding disordered eating and body dissatisfaction; identify what to say to friends in these situations to encourage intuitive eating and body acceptance</td>
<td>Cognitive Dissonance, Role play, Cognitive behavior therapy</td>
<td>Intuitive eating, Body dissatisfaction, Thin-ideal internalization</td>
</tr>
<tr>
<td>Record 24-hour food journal and try to apply the concept of body-food congruence</td>
<td>Self-monitoring</td>
<td>Intuitive Eating</td>
</tr>
<tr>
<td>Identify two short-term and two long-term goals that you would like to work on based on the material learned throughout the semester</td>
<td>Goal setting</td>
<td></td>
</tr>
</tbody>
</table>

141
Appendix C. Course Syllabus

Kent State University
College of Public Health

Spring 2014
PH 40195: Dieting, Body Image, and Healthy Weight in College
Monday/Wednesday 2:15 – 3:30 White Hall 105

Instructor
Julie Schaefer, MS RD
Doctoral Student, Prevention Science
3rd Floor Lowry Hall
Phone: (330) 672-6500
Fax: (330) 672-6505
Email: jschae15@kent.edu
Office Hours: Monday 12:00-2:00; Tuesday 10:00-12:00; Wednesday 12:00-2:00, or by appointment

Course Description
As obesity continues to rise in our society, it is becoming more apparent that dieting is not only an ineffective means to weight loss, but has other adverse psychological and physical outcomes. In this class, a new approach to weight management, intuitive eating, will be explored. Intuitive eating encompasses 10 principles: reject the diet mentality, honor your hunger, make peace with food, challenge the food police, feel your fullness, discover the satisfaction factor, cope with your emotions without using food, respect your body, exercise – feel the difference, and honor your health – gentle nutrition. The purpose of this course is to learn why the traditional approach to weight loss has failed, explore a new relationship with food through intuitive eating and understand body image in our society.

Course Prerequisite(s)
None

Course Learning Objectives
1. To describe and define the basic principles of nutrition science
2. To compare and contrast the traditional approach to weight loss and a new paradigm of weight management and discuss research relevant to both
3. To identify the 10 principles of intuitive eating and describe the research and rationale supporting them
4. To adopt new attitudes and behaviors and identify strategies to maintain them
5. To describe the risk factors for and consequences of body dissatisfaction
6. To recognize how cultural norms reinforce an unattainable body shape
7. To describe and discuss the prevalence and risk factors for eating disorders and obesity and the effect of these conditions on Public Health
8. To communicate the information learned in this class to others who are at risk for these issues
9. To understand the basic sections of a peer-reviewed research article
Required Materials
There is no required text for this course.

Grading
1. 6 in-class quizzes on the reading @ 10 points each 60 points
   a. Quiz 1: Dieting
   b. Quiz 2: 10 Principles & Children Eating Habits
   c. Quiz 3: Mindful vs. Mindless Eating
   d. Quiz 4: Respect Your Body & Positive Body Image
   e. Quiz 5: Exercise & Eating Disorders
   f. Quiz 6: Obesity & Shared Risk Factors
2. 8 Graded homework assignments 90 points
   a. HW 1: 24 Hour Food Journal (15 points)
   b. HW 2: Op-ed article on Dieting (10 points)
   c. HW 3: Journal – Hunger & Fullness (10 points)
   d. HW 4: Journal – Mindful Eating Experience (10 points)
   e. HW 5: Food Police & Alternative Thoughts (10 points)
   f. HW 6: External Triggers & Solutions (10 points)
   g. HW 7: Bring in an Advertisement (10 points)
   h. HW 8: 24 Hour Food Journal (15 points)
3. How to Read a Scientific Paper & Bottomless Bowls Assignment 10 points
4. Attendance (30 classes, 2 points per class) 60 points
5. In Class Activities (5 points each) 40 points
   a. Activity #1: Hunger & Fullness Barriers
   b. Activity #2: Chocolate Exercise
   c. Activity #3: Movie Discussion
   d. Activity #4: HW 7 Presentation and discussion
   e. Activity #5: Dove Real Beauty video
   f. Activity #6: Do I Contribute to Another’s Eating Disorder
   g. Activity #7: Role Play
   h. Activity #8: Goal Setting
6. Magazine Project 50 points
7. Presentation 50 points
8. Midterm Exam 50 points
9. Final Exam 70 points

Total 480 points

Letter grades will be assigned according to the following scale as a percentage of the total points possible.

92% to 100% A
90% to 91% A-
88% to 89% B+
82% to 87% B
80% to 81% B-
78% to 79% C+
72% to 77% C

70% to 71% C-
68% to 69% D+
60% to 67% D
Below 60% F
Readings
The readings that are numbered in the syllabus can be found in the e-reserves. There is a link to our class e-reserves site on blackboard. Links to all other readings can be found in blackboard under the corresponding learning module.

Quizzes
All quizzes will cover the assigned readings listed in the course schedule. If you have an excused absence on the day of a quiz, it is your responsibility to make arrangements with the instructor to complete a make-up assignment. If you have an unexcused absence on the day of a quiz, you will receive a zero.

Homework Assignments
Instructions for homework assignments will be given in class. Homework assignments are to be turned in before class on the due date listed in the course schedule. Late assignments will not be accepted.

Attendance
Attendance will be taken every class. Two points will be deducted from your attendance grade for each class you miss without an excused absence. Excused absences require proper documentation from the doctor, university, or respective institute responsible for the absence.

Class Participation
You will receive points for in-class activities. Each activity is worth five points. If you have an excused absence on the day of an activity, it is your responsibility to make arrangements with the instructor to complete a make-up assignment. If you have an unexcused absence on the day of an activity, you will receive a zero.

Magazine Project
Using the homework assignments you completed this semester, you will create your own magazine about the topics discussed throughout the semester. Specific instructions will be provided.

Presentation
You will be required to give a 10-15 minute presentation designed for a group of high school students regarding the topics discussed throughout the semester. Specific instructions will be provided.

Midterm and Final Exams
The midterm and final exams will be multiple choice exams. The exams will be completed in class on the dates specified in the course schedule.

Policy on Late Assignments and Missed Exams
If you know you are going to have a conflict, please contact the instructor prior to the due dates or exam dates for consideration of an extension. Late homework assignments will only be accepted with proper documentation from a doctor, the university, or the respective institution responsible for the absence.
Classroom Etiquette
There will be no use of cell phones during class. Turn them off or on silent and place them out of sight.

Use of E-mail
E-mail is an official means of communication between Kent State University and students. It is your responsibility to check your Kent State e-mail account regularly. It is also important to use your Kent State e-mail account when corresponding with your instructor. E-mail services such as Gmail, Hotmail, and Yahoo can be blocked by the university and should not be used to correspond with your instructors.

Regarding Students with Disabilities (Revised 6/01/07)
University policy 3342-3-01.3 requires that students with disabilities be provided reasonable accommodations to ensure their equal access to course content. If you have a documented disability and require accommodations, please contact the instructor at the beginning of the semester to make arrangements for necessary classroom adjustments. Please note, you must first verify your eligibility for these through Student Accessibility Services (contact 330-672-3391 or visit www.kent.edu/sas for more information on registration procedures).

Academic Dishonesty
The University Policy Register defines academic dishonesty, potential sanctions, and the administrative process of imposing and reviewing those sanctions. It is the student’s responsibility to thoroughly familiarize themselves with this policy. The full text can be found here:
http://www.kent.edu/publichealth/academic_dishonesty.cfm

Section 3-01.8(B) of the policy states:
(B) Definitions. As used in this rule:
   (1) "Cheat" means intentionally to misrepresent the source, nature, or other conditions of academic work so as to accrue undeserved credit, or to cooperate with someone else in such misrepresentation. Such misrepresentations may, but need not necessarily, involve the work of others. As defined, cheating includes, but is not limited to:
      (a) Obtaining or retaining partial or whole copies of examination, tests or quizzes before these are distributed for student use;
      (b) Using notes, textbooks or other information in examinations, tests and quizzes, except as expressly permitted;
      (c) Obtaining confidential information about examinations, tests or quizzes other than that released by the instructor;
      (d) Securing, giving or exchanging information during examinations;
      (e) Presenting data or other material gathered by another person or group as one's own;
      (f) Falsifying experimental data or information;
      (g) Having another person take one's place for any academic performance without the specific knowledge and permission of the instructor;
      (h) Cooperating with another to do one or more of the above; and
      (i) Using a substantial portion of a piece of work previously submitted for another course or program to meet the requirements of the present course
or program without notifying the instructor to whom the work is presented.

(j) Presenting falsified information in order to postpone or avoid examinations, tests, quizzes, or other academic work.

(2) "Plagiarize" means to take and present as one's own a material portion of the ideas or words of another or to present as one's own an idea or work derived from an existing source without full and proper credit to the source of the ideas, words, or works. As defined, plagiarize includes, but is not limited to:

(a) The copying of words, sentences and paragraphs directly from the work of another without proper credit;

(b) The copying of illustrations, figures, photographs, drawings, models, or other visual and nonverbal materials, including recordings, of another without proper credit; and

(c) The presentation of work prepared by another in final or draft form as one's own without citing the source, such as the use of purchased research papers.

Additional resources regarding plagiarism can be found on the Kent State Library website at: http://www.library.kent.edu/page/11299

| Course Schedule |
|-----------------|-----------------|-----------------|------------------|
| Topic(s)        | Reading         | Activities      | Homework Assigned |
| 1/13            | Introductions   | Syllabus        |                  |
| 1/15            | Nutrition       | Reading #1      | HW #1: Food      |
|                 | Recommendations | (Davis & Saltos, 1999, in e-reserves) | Journal (due 1/22) |
| 1/20            | Martin Luther   |                 |                  |
|                 | King, Jr. Day   |                 |                  |
|                 | – No class      |                 |                  |
| 1/22            | Nutrition Science |          | (HW #1 due)      |
| 1/27            | Eating Patterns |                  |                  |
| 1/29            | Dieting         | Reading #2      | Quiz #1          |
|                 |                  | (Mann et al., 2007, in e-reserves) |                  |
|                 |                  | Reading #3      |                  |
|                 |                  | (Garner, 1998, in e-reserves) |                  |
|                 |                  | Reading – Warning: Dieting Increases Your Risk of Gaining More Weight (weblink) |                  |
| 2/3             | Dieting         |                  | HW #2: Dieting   |
|                 |                  |                  | (due 2/10)       |
| 2/5             | Introduction to | Reading – Intuitive Eating (weblink) | Quiz #2          |
|                 | Intuitive Eating | Reading – Traditional vs. Non-diet Approach |                  |

146
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading 1</th>
<th>Reading 2</th>
<th>Activity/Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/10</td>
<td>Children’s Eating Habits</td>
<td>Reading #4 (Eneli et al., 2008, in e-reserves)</td>
<td></td>
<td>(HW #2 due)</td>
</tr>
<tr>
<td>2/12</td>
<td>Hunger, Fullness, and Satisfaction</td>
<td>Reading – Understanding Hunger and Fullness (weblink)</td>
<td>In Class Activity 1: Hunger &amp; Fullness Barriers</td>
<td></td>
</tr>
<tr>
<td>2/17</td>
<td>Hunger, Fullness, and Satisfaction; Reading a research article</td>
<td>Reading – How to Read a Scientific Paper (weblink)</td>
<td>HW #3: Hunger &amp; Fullness (due 2/24); Bottomless Bowls Activity (due 2/24)</td>
<td></td>
</tr>
<tr>
<td>2/19</td>
<td>Mindful &amp; Mindless Eating</td>
<td>Reading #6 (Mathieu, 2009, in e-reserves)</td>
<td>Quiz #3</td>
<td></td>
</tr>
<tr>
<td>2/24</td>
<td>Mindful &amp; Mindless Eating</td>
<td>In Class Activity 2: Chocolate Exercise</td>
<td>(HW #3 due)</td>
<td>HW #4: Mindful Eating (due 3/3)</td>
</tr>
<tr>
<td>2/26</td>
<td>Make Peace with Food &amp; Challenge the Food Police</td>
<td></td>
<td>HW #5: Food Police (due 3/10)</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>External Triggers &amp; Emotional Eating</td>
<td></td>
<td>(HW #4 due)</td>
<td>HW #6: External &amp; Emotional Triggers (due 3/12)</td>
</tr>
<tr>
<td>3/5</td>
<td>Midterm Exam</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/10</td>
<td>Advertising Reinforcement of Unrealistic Body Image</td>
<td>Movie – Jean Kilbourne: Killing Us Softly 4 Take notes</td>
<td>(HW #5 due)</td>
<td>HW #7: Bring in an advertisement and discuss it’s hidden positive or negative messages (due 3/19)</td>
</tr>
<tr>
<td>3/12</td>
<td>Movie Discussion</td>
<td>In Class Activity 3: Discussion Participation</td>
<td></td>
<td>(HW #6 due)</td>
</tr>
<tr>
<td>3/17</td>
<td>No Class – Turn in rough draft of magazine project</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

147
<table>
<thead>
<tr>
<th>Date</th>
<th>Activity/Assignment</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/19</td>
<td>Present HW #7</td>
<td>In Class Activity 4: Present HW #7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(HW #7 due)</td>
</tr>
<tr>
<td></td>
<td>Spring break 3/24 to 3/30</td>
<td></td>
</tr>
<tr>
<td>4/2</td>
<td>Positive Body Image</td>
<td>Reading #8 (Bacon &amp; Aphramor, 2011, in e-reserves) Reading – Beauty Redefined (weblink) Quiz #5</td>
</tr>
<tr>
<td>4/7</td>
<td>In Class Activity 6: Do I Contribute to Another’s Eating Disorder?</td>
<td></td>
</tr>
<tr>
<td>4/9</td>
<td>Active Lifestyle</td>
<td></td>
</tr>
<tr>
<td>4/14</td>
<td>Spectrum of Weight Issues</td>
<td>Reading #9 (Currin et al., 2005, in e-reserves)</td>
</tr>
<tr>
<td>4/16</td>
<td>Spectrum of Weight Issues</td>
<td></td>
</tr>
<tr>
<td>4/21</td>
<td>Similar Risk Factors</td>
<td>Reading #10 (Haines J &amp; Neumark-Sztainer, 2006, in e-reserves) Quiz #6 In Class Activity 7: Role Play</td>
</tr>
<tr>
<td>4/23</td>
<td>Gentle Nutrition</td>
<td></td>
</tr>
<tr>
<td>4/28</td>
<td>Other Models of Intuitive Eating</td>
<td>Reading #11 (Miller &amp; Jacob, 2001, in e-reserves) Reading #12 (Satter, 2007, in e-reserves) In Class Activity 8: Goal Setting</td>
</tr>
<tr>
<td>4/30</td>
<td>Presentations</td>
<td></td>
</tr>
<tr>
<td>5/7</td>
<td>Final Exam 12:45-3:00</td>
<td></td>
</tr>
</tbody>
</table>

HW #7 due
Appendix D. Intuitive Eating Intervention Survey Instrument

Part I: Demographics:  Please check one.

Gender

_____ Male
_____ Female

Which best describes you?

_____ American Indian or Alaska Native
_____ Asian
_____ Black or African American
_____ Native Hawaiian or Pacific Islander
_____ Hispanic or Latino
_____ White

Year in College

_____ Freshman
_____ Sophomore
_____ Junior
_____ Senior

Major

_____ Public Health
_____ Nutrition
_____ Exercise Physiology
_____ Other: ___________________________________________

Age

_____ years

Height

_____ inches

Weight

_____ pounds
## Part II: Intuitive Eating

*Please check one answer for each question.*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>1 Strongly Disagree</th>
<th>2 Disagree</th>
<th>3 Neutral</th>
<th>4 Agree</th>
<th>5 Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I try to avoid certain foods high in fat, carbohydrates, or calories.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>I find myself eating when I’m feeling emotional (e.g., anxious, depressed, sad), even when I’m not physically hungry.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>If I am craving a certain food, I allow myself to have it.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>I get mad at myself for eating something unhealthy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>I find myself eating when I am lonely, even when I’m not physically hungry.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>I trust my body to tell me when to eat.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>I trust my body to tell me what to eat.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>I trust my body to tell me how much to eat.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>I have forbidden foods that I don’t allow myself to eat.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>I use food to help me soothe my negative emotions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>I find myself eating when I am stressed out, even when I’m not physically hungry.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>I am able to cope with my negative emotions (e.g., anxiety, sadness) without turning to food for comfort.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>When I am bored, I do NOT eat just for something to do.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>When I am lonely, I do NOT turn to food for comfort.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>I find other ways to cope with stress and anxiety than by eating.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>I allow myself to eat what food I desire at the moment.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>I do NOT follow eating rules or dieting plans that dictate what, when, and/or how much to eat.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Most of the time, I desire to eat nutritious foods.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>I mostly eat foods that make my body perform efficiently (well).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
20. I mostly eat foods that give my body energy and stamina.  

21. I rely on my hunger signals to tell me when to eat.  

22. I rely on my fullness (satiety) signals to tell me when to stop eating.  

23. I trust my body to tell me when to stop eating.

<p>| Part III: Eating Behaviors &amp; Attitudes: Please check one answer for each question. |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| 1. I am terrified about being overweight. | 1 Always | 2 Usually | 3 Often | 4 Sometimes | 5 Rarely | 6 Never |
| 2. I avoid eating when I am hungry. | 1 Always | 2 Usually | 3 Often | 4 Sometimes | 5 Rarely | 6 Never |
| 3. I find myself preoccupied with food. | 1 Always | 2 Usually | 3 Often | 4 Sometimes | 5 Rarely | 6 Never |
| 4. I have gone on eating binges where I feel that I may not be able to stop. | 1 Always | 2 Usually | 3 Often | 4 Sometimes | 5 Rarely | 6 Never |
| 5. I cut my food into small pieces. | 1 Always | 2 Usually | 3 Often | 4 Sometimes | 5 Rarely | 6 Never |
| 6. I am aware of the calorie content of foods that I eat. | 1 Always | 2 Usually | 3 Often | 4 Sometimes | 5 Rarely | 6 Never |
| 7. I particularly avoid food with a high carbohydrate content (i.e. bread, rice, potatoes, etc.). | 1 Always | 2 Usually | 3 Often | 4 Sometimes | 5 Rarely | 6 Never |
| 8. I feel that others would prefer if I ate more. | 1 Always | 2 Usually | 3 Often | 4 Sometimes | 5 Rarely | 6 Never |
| 9. I vomit after I have eaten. | 1 Always | 2 Usually | 3 Often | 4 Sometimes | 5 Rarely | 6 Never |
| 10. I feel extremely guilty after eating. | 1 Always | 2 Usually | 3 Often | 4 Sometimes | 5 Rarely | 6 Never |
| 11. I am preoccupied with a desire to be thinner. | 1 Always | 2 Usually | 3 Often | 4 Sometimes | 5 Rarely | 6 Never |
| 12. I think about burning up calories when I eat. | 1 Always | 2 Usually | 3 Often | 4 Sometimes | 5 Rarely | 6 Never |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>13. Other people think that I am too thin.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. I am preoccupied with the thought of having fat on my body.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. I take longer than others to eat my meal.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. I avoid foods with sugar in them.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. I eat diet foods.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. I feel that food controls my life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. I display self-control around food.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. I feel that others pressure me to eat.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. I give too much time and thought to food.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. I feel uncomfortable after eating sweets.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. I engage in dieting behavior.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. I like my stomach empty.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. I have the impulse to vomit after meals.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. I enjoy trying new rich foods.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Once a Month or Less</th>
<th>2-3 Times a Month</th>
<th>Once a Week</th>
<th>2-6 Times a Week</th>
<th>Once a Day or More</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Gone on eating binges where you feel that you may not be able to stop?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Ever made yourself sick (vomited) to control your weight or shape?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Ever used laxatives, diet pills, or diuretics (water pills) to control your weight or shape?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Exercised more than 60 minutes a day to control your weight?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Lost 20 pounds or more in the past 6 months?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Part IV: Physical Activity:** The following questions will ask you about the time you spent being physically active.

<table>
<thead>
<tr>
<th>Vigorous-intensity activity causes large increases in breathing or heart rate and is done for at least 10 minutes continuously.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>In a typical week, on how many days do you do vigorous physical activity as part of your work (job, chores, or yard work)?</td>
<td>_____ days</td>
</tr>
<tr>
<td>How much time do you spend doing vigorous-intensity activity during your work (job, chores, or yard work)?</td>
<td>_____ minutes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Moderate-intensity activity causes small increases in breathing or heart rate and is done for at least 10 minutes continuously.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>In a typical week, on how many days do you do moderate physical activity as part of your work (job, chores, or yard work)?</td>
<td>_____ days</td>
</tr>
<tr>
<td>How much time do you spend doing moderate-intensity activity during your work (job, chores, or yard work)?</td>
<td>_____ minutes</td>
</tr>
</tbody>
</table>

The following questions exclude the work activity already mentioned.

| In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places? | _____ days |
| How much time do you spend walking or bicycling for travel on a typical day? | _____ minutes |

The following questions exclude work and transportation activity already mentioned.

| In a typical week, on how many days do you do vigorous-intensity sports, fitness, or recreational activities? | _____ days |
| How much time do you spend doing vigorous-intensity sports, fitness, or recreational activities on a typical day? | _____ minutes |

| In a typical week, on how many days do you do moderate-intensity sports, fitness, or recreational activities such as brisk walking, bicycling, swimming, or golf for at least 10 minutes continuously? | _____ days |
| How much time do you spend doing moderate-intensity sports, fitness, or recreational activities on a typical day? | _____ minutes |
Part V: Body Image:  Please check one answer for each question.

<table>
<thead>
<tr>
<th></th>
<th>1 Never</th>
<th>2 Rarely</th>
<th>3 Sometimes</th>
<th>4 Often</th>
<th>5 Very Often</th>
<th>6 Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Have you been so worried about your shape that you have been feeling that you ought to diet?</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>2. Have you been afraid that you might become fat (or fatter)?</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>3. Has feeling full (e.g., after eating a large meal) made you feel fat?</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>4. Have you noticed the shape of other women and felt that your own shape compared unfavorably?</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>5. Has thinking about your shape interfered with your ability to concentrate (e.g., while watching television, reading, or listening to conversations)?</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>6. Has being naked, such as when taking a bath, made you feel fat?</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>7. Have you imagined cutting off fleshy areas of your body?</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>8. Have you not gone out to social occasions (e.g.,</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>parties) because you have felt bad about your shape?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>9.</td>
<td>Have you felt excessively large and rounded?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Have you thought that you are the shape you are because you lack self-control?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Have you worried about other people seeing rolls of flesh around your waist or stomach?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>When in company have you worried about taking up too much room (e.g., sitting on a sofa or bus seat)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Has seeing your reflection (e.g., in a mirror or ship window) made you feel bad about your shape?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Have you pinched areas of your body to see how much fat there is?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Have you avoided situations where people could see your body (e.g., communal changing rooms or swimming baths)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Have you been particularly self-conscious about your shape when in the company of other people?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part VI: Body Ideal Beliefs:  Please check one answer for each question.

<table>
<thead>
<tr>
<th></th>
<th>1 Completely Disagree</th>
<th>2</th>
<th>3 Neither Agree nor Disagree</th>
<th>4</th>
<th>5 Completely Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I would like my body to look like the people who are on TV.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2. I compare my body to the bodies of TV and movie stars.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3. I would like my body to look like the models who appear in magazines.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4. I compare my appearance to the appearance of TV and movie stars.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5. I would like my body to look like the people who are in the movies.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6. I compare my body to the bodies of people who appear in magazines.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7. I wish I looked like the models in music videos.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8. I compare my appearance to the appearance of people in magazines.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>9. I try to look like the people on TV.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
Appendix E. Initial Instrument: Weight Management Knowledge Attitudes, and Practices of RD/Ns in the U.S.

Before taking part in this study, please read the information below and click on the "I Agree" button at the bottom of the page if you understand the statements and freely consent to participate in the study.

Consent Form

This study is designed to gather information on the knowledge, attitudes, and practices of registered dietitians regarding weight management counseling. Even if you do not counsel patients about weight management, there are still questions that you can answer. The study is being conducted by Julie Schaefer, RD, MS, a PhD candidate in Public Health at Kent State University and is supported by the Commission on Dietetic Registration (CDR). Your participation in the study will help us better understand how to tailor weight management interventions.

This study consists of a survey. Completing the survey will take 5 to 15 minutes. The survey will begin by asking you a few questions about yourself and then ask you questions about your knowledge, attitudes, and practices regarding specific aspects of weight management. You are able to exit the survey and complete it at a later time if needed. Simply follow the link in the original e-mail when you are ready to finish your survey.

This study is anonymous. All responses are treated as confidential, and in no case will your responses be identified. All responses will be pooled and published in aggregate form only. No deception is involved, and the study involves no more than minimal risk. Participation is voluntary, refusal to take part in the study involves no penalty or loss of benefits to which you are otherwise entitled, and you may withdraw from the study at any time. Results from the survey will be made available through published literature or by requesting it from the investigator: Julie Schaefer. The study has been approved by the Kent State University Institutional Review Board.

If you have further questions about this study or your rights, or if you wish to lodge a complaint or concern, you may contact Julie Schaefer at jschae15@kent.edu, Dr. Melissa Zullo at 330-672-6509 or mellenbu@kent.edu; or the Kent State University Institutional Review Board, at (330) 672-2704.

If you are 18 years of age or older, understand the statements above, and freely consent to participate in the study, click on the "I Agree" button to begin the survey.
1. Are you a registered dietitian (RD)?
   ______ Yes
   ______ No

If yes, continue.

**Part I: Demographics**

1. Gender
   ______ Male
   ______ Female

2. Age ______ years

3. Are you Hispanic or Latino?
   ______ Yes
   ______ No

4. Which one of these groups would you say best represents your race?
   ______ White
   ______ Black or African American
   ______ American Indian or Alaska Native
   ______ Asian
   ______ Pacific Islander

5. What is your highest level of completed education?
   ______ Bachelor’s degree
   ______ Master’s degree
   ______ Doctorate degree

6. How would you describe your main practice setting?
   ______ Clinical
   ______ Community
   ______ Research or academia
   ______ Private practice
   ______ Industry
   ______ Other: ____________________________

7. Are you certified in adult weight management?
   ______ Yes
   ______ No

8. Are you certified in pediatric weight management?
   ______ Yes
   ______ No

9. In what state do you practice? ____________

Do you currently counsel overweight and/or obese clients for weight management?  ______ Yes  ______ No

How many years of experience do you have in counseling clients for weight management? ______ years
Part II: Now I am going to ask you a series of questions regarding the specific practices you use when counseling overweight and/or obese clients. Please indicate how often you use the following strategies.

<table>
<thead>
<tr>
<th>How often do you...</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Usually</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Give specific advice to eat fewer calories?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Give specific advice to reduce total fat intake?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Advise clients to follow specific dieting plans that dictate what, when, and/or how much to eat?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Give general advice to do more exercise?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Give specific advice regarding opportunities for increasing incidental physical activity?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Help clients find ways to be physically active that are enjoyable, rather than following a strict exercise regimen?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Give advice regarding distribution of meals and snacks throughout the day?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Give practical advice regarding shopping and cooking to achieve dietary goals?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Help clients identify and eat foods that they enjoy and are nutritious?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Give specific advice regarding the glycemic index of foods?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Give specific advice on macronutrient distribution (i.e. percent of energy from carbohydrate, protein, and fat)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Give specific advice on using the Dietary Guidelines for Americans or MyPlate.gov?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Encourage clients to avoid foods high in fat, carbohydrates, or calories.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Work with clients using behavior modification techniques?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Recommend using a food journal/diary to monitor exact calories, portions, etc.?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Recommend using a food journal/diary to note general portions or amount of food intake?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Help clients learn to recognize and eat based on their internal signals of hunger, fullness, and satiety?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Recommend keeping a weight journal/diary?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Suggest that clients weigh themselves?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Work with clients to increase self-esteem?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Work with clients to increase self-acceptance of weight?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Recommend commercial weight loss supplements?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Recommend herbs or botanicals for weight loss?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Recommend a commercial or community-based weight management program?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Have you ever heard of intuitive eating?  _____Yes  _____No

Part III: Now I am going to ask you a series of questions about intuitive eating. Please indicate whether each statement is true or false or if you do not know the answer.

<table>
<thead>
<tr>
<th></th>
<th>True</th>
<th>False</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>☐ X</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2.</td>
<td>☐ X</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4.</td>
<td>☐</td>
<td>☐ X</td>
<td>☐</td>
</tr>
<tr>
<td>5.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8.</td>
<td>☐</td>
<td>☐ X</td>
<td>☐</td>
</tr>
<tr>
<td>9.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>10.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>11.</td>
<td>☐ X</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>12.</td>
<td>☐</td>
<td>☐ X</td>
<td>☐</td>
</tr>
<tr>
<td>13.</td>
<td>☐ X</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>14.</td>
<td>☐ X</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
How strongly do you support the use of intuitive eating to promote a healthy lifestyle?

<table>
<thead>
<tr>
<th>Strongly Do Support</th>
<th>Do Not Support</th>
<th>Neutral Support</th>
<th>Strongly Support</th>
<th>I have never heard of intuitive eating</th>
</tr>
</thead>
</table>

Part III: Now I’m going to ask you a series of questions about your attitudes towards various health-related behaviors. Please indicate how strongly you agree or disagree with the following statements.

<table>
<thead>
<tr>
<th>I strongly disagree, disagree, am neutral, agree, or strongly agree that…</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Individuals can change their health without trying to lose weight.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Weight loss should be the primary focus to improve health in overweight and/or obese individuals.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Intuitive eating is more effective than calorie-restricted dieting for long-term weight loss and/or maintenance.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. It is important for individuals to learn to eat based on internal cues of hunger, fullness, and satisfaction.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. To lose weight, overweight and/or obese individuals should consciously restrict calories, fat, and/or carbohydrates.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. It is important for individuals to give themselves unconditional permission to eat (i.e. without counting, restricting, or planning to expend calories).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. It is important for individuals to avoid or restrict foods they enjoy if those foods are high in calories, fat, and/or carbohydrates.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. It is important for individuals to eat mostly for physical (i.e. hunger) reasons.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. It is important for individuals to eat mostly for emotional (i.e. stress or boredom) reasons.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. It is important for individuals to choose foods that honor health and body function that also taste good.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. It is important for individuals to accept and appreciate their bodies regardless of size or weight.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Intuitive eating is an adaptive style of eating.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Students studying to become registered dietitians should be educated about intuitive eating.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Registered dietitians should be trained to use intuitive eating for weight management.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix F. Final Survey Instrument: Weight Management Knowledge Attitudes, and Practices of RD/Ns in the U.S.

1. Please indicate your current state of practice.
   ___ I am a registered dietitian/nutritionist (RD/N) currently practicing in the dietetics field.
   ___ I am a registered dietitian/nutritionist (RD/N) NOT currently practicing in the dietetics field.
   ___ I am retired.

Before taking part in this study, please read the information below and click on the "I Agree" button at the bottom of the page if you understand the statements and freely consent to participate in the study.

Consent Form

This study is designed to gather information on the knowledge, attitudes, and practices of registered dietitians regarding weight management counseling. Even if you do not counsel patients about weight management, there are still questions that you can answer. The study is being conducted by Julie Schaefer, RD, MS, a PhD candidate in Public Health at Kent State University and is supported by the Commission on Dietetic Registration (CDR). Your participation in the study will help us better understand how to tailor weight management interventions.

This study consists of a survey. Completing the survey will take 5 to 15 minutes. The survey will begin by asking you a few questions about yourself and then ask you questions about your knowledge, attitudes, and practices regarding specific aspects of weight management. You are able to exit the survey and complete it at a later time if needed. Simply follow the link in the original e-mail when you are ready to finish your survey.

This study is anonymous. All responses are treated as confidential, and in no case will your responses be identified. All responses will be pooled and published in aggregate form only. No deception is involved, and the study involves no more than minimal risk. Participation is voluntary, refusal to take part in the study involves no penalty or loss of benefits to which you are otherwise entitled, and you may withdraw from the study at any time. Results from the survey will be made available through published literature or by requesting it from the investigator: Julie Schaefer. The study has been approved by the Kent State University Institutional Review Board.

If you have further questions about this study or your rights, or if you wish to lodge a complaint or concern, you may contact Julie Schaefer at jschae15@kent.edu, Dr. Melissa Zullo at 330-672-6509 or mellenbu@kent.edu; or the Kent State University Institutional Review Board, at (330) 672-2704.

If you are 18 years of age or older, understand the statements above, and freely consent to participate in the study, click on the "I Agree” button to begin the survey.
Are you a registered dietitian (RD)?

______ Yes
______ No

Part I: Demographics

1. Gender
   ____ Male
   ____ Female

2. Age
   ____ years

3. Are you Hispanic or Latino?
   ____ Yes
   ____ No

4. Which one of these groups would you say best represents your race?
   ____ White
   ____ Black or African American
   ____ American Indian or Alaska Native
   ____ Asian
   ____ Pacific Islander

5. What is your highest level of completed education?
   ____ Bachelor’s degree
   ____ Master’s degree
   ____ Doctorate degree

6. How would you describe your main practice setting?
   ____ Clinical
   ____ Community
   ____ Research or academia
   ____ Private practice
   ____ Industry
   ____ Other: ____________________________

7. Have you completed the CDR Certificate of Training in Weight Management?
   ____ Yes, I have completed the Certificate of Training in Adult Weight Management
   ____ Yes, I have completed the Certificate of Training in Childhood and Adolescent Weight Management
   ____ Yes, I have completed the Certificate of Training in Level 2 Adult Weight Management
   ____ Yes, I have completed more than one of the above.
   ____ No, I have not completed any of the above.

8. In what state do you practice? ____________

Do you currently counsel overweight and/or obese clients for weight management?

____ Yes  ____ No

If yes, how many years of experience do you have in counseling clients for weight management?

______ years
Part II: Now I am going to ask you a series of questions regarding the specific practices you use when counseling overweight and/or obese clients. Please indicate how often you use the following strategies.

<table>
<thead>
<tr>
<th>How often do you…</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Usually</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Give specific advice to eat fewer calories?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Give specific advice to reduce total fat intake?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Advise clients to follow specific dieting plans that dictate what, when, and/or how much to eat?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Give specific advice regarding opportunities for increasing incidental physical activity?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Help clients find ways to be physically active that are enjoyable, rather than following a strict exercise regimen?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Give advice regarding distribution of meals and snacks throughout the day?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Give practical advice regarding shopping and cooking to achieve dietary goals?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Help clients identify and eat foods that they enjoy and are nutritious?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Encourage clients to avoid foods high in fat, carbohydrates, or calories.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Work with clients using behavior modification techniques?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Recommend using a food journal/diary to monitor exact calories, portions, etc.?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Help clients learn to recognize and eat based on their internal signals of hunger, fullness, and satiety?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Recommend keeping a weight journal/diary?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Recommend keeping a hunger awareness journal/diary?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Suggest that clients weigh themselves?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Work with clients to increase self-esteem?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Work with clients to increase self-acceptance of weight?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part III: Now I am going to ask you a series of questions about intuitive eating. Please indicate whether each statement is true or false or if you do not know the answer.

<table>
<thead>
<tr>
<th></th>
<th>True</th>
<th>False</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. An intuitive eater tries to avoid certain foods high in fat, carbohydrates, or calories.</td>
<td>□</td>
<td>□ X</td>
<td>□</td>
</tr>
<tr>
<td>2. An intuitive eater eats when feeling emotional (e.g., anxious, depressed, sad), even when not physically hungry.</td>
<td>□</td>
<td>□ X</td>
<td>□</td>
</tr>
<tr>
<td>3. If craving a certain food, an intuitive eater allows his/herself to have it.</td>
<td>□ X</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>4. An intuitive eater gets mad at his/herself for eating something unhealthy.</td>
<td>□</td>
<td>□ X</td>
<td>□</td>
</tr>
<tr>
<td>5. An intuitive eater is able to cope with negative emotions (e.g., anxiety, sadness) without turning to food for comfort.</td>
<td>□ X</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>6. An intuitive eater allows his/herself to eat what food is desired at the moment.</td>
<td>□ X</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>7. Most of the time, an intuitive eater desires to eat nutritious foods.</td>
<td>□ X</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>8. An intuitive eater mostly eats foods that make his/her body perform efficiently (well).</td>
<td>□ X</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>9. An intuitive eater relies on his/her hunger signals to tell him/her when to eat.</td>
<td>□ X</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>10. An intuitive eater relies on his/her fullness (satiety) signals to tell him/her when to stop eating.</td>
<td>□ X</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>11. Research has shown that intuitive eating is positively associated with a normal body mass index.</td>
<td>□ X</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>12. Research has shown that weight loss is necessary for overweight and/or obese individuals to improve their health</td>
<td>□</td>
<td>□ X</td>
<td>□</td>
</tr>
<tr>
<td>13. Research has shown that intuitive eating is positively associated with psychological well-being (i.e. self-esteem, overall life satisfaction, and proactive coping skills)</td>
<td>□ X</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>14. Research has shown that intuitive eating is inversely (negatively) associated with disordered eating, body dissatisfaction, and internalization of the thin ideal</td>
<td>□ X</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
Part IV: Now I’m going to ask you a series of questions about your attitudes towards various health-related behaviors. Please respond to the following statements.

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How strongly do you support the use of intuitive eating to promote a healthy lifestyle?</td>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Neutral</td>
<td>Agree</td>
<td>Strongly Agree</td>
<td>Don’t Know</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I strongly disagree, disagree, am neutral, agree, or strongly agree that…</td>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Neutral</td>
<td>Agree</td>
<td>Strongly Agree</td>
<td>Don’t Know</td>
</tr>
<tr>
<td>2. Intuitive eating is more effective than calorie-restricted dieting for long-term weight loss and/or maintenance.</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. It is important for individuals to learn to eat based on internal cues of hunger, fullness, and satisfaction.</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. It is important for individuals to choose foods that honor health and body function that also taste good.</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Intuitive eating is an adaptive style of eating.</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Students studying to become registered dietitians should be educated about intuitive eating.</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Registered dietitians should be trained to use intuitive eating for weight management.</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part V: Finally, I’m going to ask you a few questions about your personal eating attitudes and behaviors. For each item, please select the answer that best characterizes your attitudes or behaviors.

<table>
<thead>
<tr>
<th></th>
<th>1 Always</th>
<th>2 Usually</th>
<th>3 Often</th>
<th>4 Sometime</th>
<th>5 Rarely</th>
<th>6 Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I am terrified about being overweight.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2</td>
<td>I avoid eating when I am hungry.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3</td>
<td>I find myself preoccupied with food.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4</td>
<td>I have gone on eating binges where I feel that I may not be able to stop.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5</td>
<td>I cut my food into small pieces.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6</td>
<td>I am aware of the calorie content of foods that I eat.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7</td>
<td>I particularly avoid food with a high carbohydrate content (i.e. bread, rice, potatoes, etc.).</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8</td>
<td>I feel that others would prefer if I ate more.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>9</td>
<td>I vomit after I have eaten.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>10</td>
<td>I feel extremely guilty after eating.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>11</td>
<td>I am preoccupied with a desire to be thinner.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>12</td>
<td>I think about burning up calories when I exercise.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>13</td>
<td>Other people think that I am too thin.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>14</td>
<td>I am preoccupied with the thought of having fat on my body.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>15</td>
<td>I take longer than others to eat my meal.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>16</td>
<td>I avoid foods with sugar in them.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>17.</td>
<td>I eat diet foods.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>I feel that food controls my life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>I display self-control around food.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>I feel that others pressure me to eat.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>I give too much time and thought to food.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>I feel uncomfortable after eating sweets.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>I engage in dieting behavior.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>I like my stomach empty.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>I have the impulse to vomit after meals.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>I enjoy trying new rich foods.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**In the past 6 months, have you...**

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Once a Month or Less</th>
<th>2-3 Times a Month</th>
<th>Once a Week</th>
<th>2-6 Times a Week</th>
<th>Once a Day or More</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Gone on eating binges where you feel that you may not be able to stop?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Ever made yourself sick (vomited) to control your weight or shape?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Ever used laxatives, diet pills, or diuretics (water pills) to control your weight or shape?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Exercised more than 60 minutes a day to control your weight?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Lost 20 pounds or more in the past 6 months?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
References


172


