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## Investigating Mindful Eating and Dietary Habits in College Students

Larissa Kleen

College of Saint Benedict/Saint John's University, LKLEEN001@CSBSJU.EDU

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## **Introduction:**

Significant weight gain in college students is a recurring health concern within the United States. Weight gain may occur due to stress, unlimited access to dining centers, consumption of alcohol, and physical inactivity. Mindful eating is a lifestyle change that encourages heightened awareness and the conscious control of one's thoughts, feelings and sensations around food. Incorporating mindfulness practice habits in college students' lives may promote intentional eating, which could reduce the occurrence of snacking without purpose, binge eating when stressed and consuming foods rapidly without enjoyment. The practice of mindful eating consists of savoring small bites as well as eating slowly and honoring the food for what it contains. Taking steps such as chewing thoroughly and involving all five senses while consuming a meal, may allow individuals to possess a better control over their eating habits as well as promote weight maintenance and emotional satisfaction.

"Mindful eating" interventions depict a variety of results related to BMI, emotional status and nutrient intake. No clear evidence exists regarding the impact of mindful eating on weight changes. However, a decrease in BMI over time in obese individuals who were placed in the mindful intervention was significant in comparison to the control group (1). Another study of 12 obese women found no change in BMI between either group. Increased cognitive restraint and self-efficacy are linked to mindful eating interventions, however no significant changes in mindfulness and depression from pre to post intervention have been concluded (2). Previous research focused on mindful eaters and their specific dietary habits have found significant evidence of reduced overall sweet, calorie and saturated fat intake (3,4).

Overall, weight management throughout college could help reduce the obesity and chronic health epidemic in the United States. Mindfulness has the potential to instill habitual long term change. College students are significantly underrepresented in research regarding mindful eating. Increased independence may lead to balanced dietary habits or inconsistent food choices throughout adulthood. Living mindfully and eating intentionally during that time may promote better health habits and result in positive long-term health effects. The objective of this study is to investigate mindful eating's association to BMI, physiological state and nutrient intake in college students.

## **Methods:**

This study involved two objectives, both cross-sectional observations. The first was to determine the prevalence of mindful eating habits among college students. For this objective, participants were recruited via mass email. The email contained a survey link. Eligibility criteria included being a CSB/SJU student between the ages of 18 and 24 years old. To encourage participation, an incentive of being entered into a random drawing to win one of two Hydro Flask water bottles was provided. The survey inquired about demographics, perceived barriers and mindful eating level. Mindful eating was assessed by the 28-item Mindful Eating Questionnaire (MEQ) which includes five subgroups: awareness, distraction, disinhibition, emotional response and emotional cues (5). The level of mindful eating was determined by calculating the mean of each domain. Scores ranged from zero to four. The higher the MEQ score the more mindful and intuitive eater the individual is expected to be. The final sample included 482 college students, primarily female and non-nutrition majors. The mindfulness score, from the MEQ questionnaire, was then used to determine if CSB/SJU college students as a group are primarily mindful eaters or not.

The second objective was to investigate the relationship between mindful eating and dietary habits in college students. Participants were recruited with a ten minute in-class presentation during introductory nutrition courses. After the presentation, students could volunteer by signing an informed consent. Eligibility criteria included being either a CSB or SJU student, between the ages of 18 and 24 years old and enrolled in either the nutrition course 110 or 125. To encourage participation, an incentive of being entered into a random drawing to win one of five \$20 Kwik Trip gift cards were provided. All participants completed a 3-day dietary recall, as a class assignment and granted the researchers access to their food records. A few days later, an online questionnaire was emailed out to all participants. This questionnaire assessed demographics and mindful eating level. Mindful eating was assessed by the 28-item Mindful Eating Questionnaire (MEQ) the same which was used in the first study. The mindful eating score was determined by calculating the mean of each of the five domains. Overall, higher scores reflect more mindful eaters. BMI was calculated using self reported height and weight measurements from the demographic questions. The final sample consisted of 43 college students with BMI levels ranging from 17.5 to 32.6 ( $M = 23.6$ ) and predominantly female. Nutrient analysis software, ESHA, was used to compute nutrient intake from the three-day food log assignment. Each nutrient report was then linked back to the participants MEQ score and BMI level in order to conclude whether more mindful college students tend to have a lower BMI and/or better dietary habits.

SPSS statistical package was used to determine differences among groups. ANOVA tests compared differences in MEQ scores and dietary intake among gender

and year in school. Total MEQ scores were then split into quartiles. ANOVA tests compared differences in subdomain scores to examine differences in quartile groups.

## **Results:**

### *Mindful Eating Prevalence Among College Students (Objective 1)*

In the first objective to find the prevalence of mindful eating on a college campus, 482 participants completed the online survey. Three did not identify with a gender, 354 were women, and 125 were male. Majority of subjects were on the continuous (unlimited) meal plan, while 121 were classified as freshman, 139 were sophomores, 135 were junior and 87 were seniors. The average body mass index (BMI) of participants was 24.6 kg/m<sup>2</sup> (SD ± 4.5). Of the total participant pool, 22 participants were nutrition majors.

MEQ total scores and the subgroups disinhibition, emotional response, and external cues differed between gender groups ( $p < 0.0001$  for all) (Table 1). Scores were not statistically significant for the domains distraction ( $p = 0.245$ ) or awareness ( $p = 0.252$ ). MEQ scores and domains did not differ among year in college, nor was there an interaction between year and gender (Table 1).

MEQ scores were then split into quartiles and domain scores compared between quartile groups. Quartile one included subjects that scored 0-2.4. Quartile two included subjects that scored 2.41-2.70. Quartile three included subjects that scored 2.71-2.9. And finally the subjects who scored 2.91-4.0 were placed in quartile 4 (Table 2). All five domains: distraction, disinhibition, emotional response, awareness and external cues, along with the total score were observed to be statistically significant between the quartiles ( $p < 0.0001$ ).

### *Relationship Between Mindful Eating and Dietary Habits (Objective 2)*

Forty three participants completed the second objective investigating the relationship between mindful eating, BMI and dietary intake. Women made up 33 of the individuals, while 10 of the participants were male. Twenty two subjects were on the continuous meal plan, while five had plans over 100 punches and 16 had under 100 punches a semester. Twenty were classified as freshman, five were sophomores, three were junior and 15 were seniors. The average body mass index (BMI) was 23.6 kg/m<sup>2</sup> (SD ± 3.1). Of the total participation pool, seven were nutrition majors.

Similar to objective one, MEQ scores were split into quartiles (Table 3). Quartile one included subjects that scored 0-2.5. Quartile two included subjects that scored

2.51-2.6. Quartile three included subjects that scored 2.61-2.9. Quartile four included subjects with scores 2.91-4.0. The domains of distraction, disinhibition, emotional response and external cues, along with the total score were observed to be statistically significant from one another ( $p < 0.0001$ ). However, the awareness domain was not observed to be significantly different between quartiles ( $p = 0.089$ ). Subjects separated by gender resulted in significantly different emotional response scores. Males scored  $3.4 \pm .4$  and females scored  $2.9 \pm .6$ , however total MEQ was not statistically significant (Table 4). No relationship between MEQ scores and dietary intake (both nutrients and calories) or BMI existed. Nutrient and caloric intake and BMI were also compared between MEQ quartile groups and yielded no significant differences between the groups,  $p = 0.234$  (Figure 1).

## **Discussion:**

The aim of this study was to investigate whether or not college students are mindful eaters and if mindfulness is related to BMI and dietary intake. In the first objective, male subjects were significantly more mindful eaters than females based on the disinhibition, emotional response, and external cues subdomain scores. The behaviors associated with these subdomains indicate that female subjects are more likely to eat in response to negative emotions, affected more by external environmental cues, and have a greater inability to stop eating when full. Male and female MEQ scores were not statistically significant for either the distraction or awareness domains. Therefore, they may react similarly to distraction and are just as aware when eating. However, only 15.7% of participants scored in the highest quartile indicating most prevalent mindful eating behaviors. There is room for improvement and education regarding mindful eating in this population.

Females may exhibit less mindful eating behaviors due to stress perception and how they deal with stress over time. Females may choose food related activities to manage stress, while males choose other activities. According to a study examining obese latino women, females are more likely to report low satisfaction with their body, which lead to internalized judgement potentially related to food intake (1). Females may struggle with controlled and intentional eating because they tend to have lower body satisfaction and self-efficacy rates. When it comes to strict diets, females are more likely to follow calorie and whole food group restrictions than men in order to lose body weight (2). Self efficacy or internal belief that change is possible is a major reason that women may struggle with weight management and mindful eating habits. A lower self belief that meaningful and sustained weight change is possible through altered dietary intake may explain why females are more emotional eaters during stressful times. An overall higher

risk of obesity in females than male may also relate to self perception of how effective food can be in managing weight and overall health.

Limitations of the first objective is the unequal distribution of gender in the population pool. Women accounted for over 70 percent of the population, therefore males were unrepresented. Another limitation is that dietary records and BMI were self-assessed. This allowed for skewed portion sizes of certain foods as well as estimated weight and height instead of exact measurements.

The second objective found no relationship between mindful eating habits, dietary intake, and BMI in the college-aged participants. However, when MEQ scores were split into quartiles for this objective, the differences in subdomain scores were similar to the data from the school-wide population. All of the subdomain scores were significantly different among total MEQ score quartile groups except for awareness. The p value for awareness was trending towards significance, indicating that this subdomain is still an important contributor to mindful eating behaviors.

Scores in all five domains were significantly different or trending toward significance depending on total score quartile because each domain represents different behaviors or tendencies. These results indicate that each one plays a role in total mindfulness, therefore each domain is important in considering when examining an individual's total mindfulness score. No clear relationship to dietary intake may have occurred mainly due to the small sample size of participants and the variety of meal plans each student had available to them. Another reason no conclusion could be drawn is associated with inaccurately recorded height and weight, dietary recall or error in entering into the ESHA software. Taking initiation and educating young college students, despite the year in school, could help relieve some of the weight gain common in this population. Based on the results, women may be considered to struggle more with emotional eating, therefore focusing on this group may benefit the most. From previous research most of the participants consist of obese women, this research supports the importance of collecting more data on women.

### **Conclusions and Limitations from Both Objectives**

One major limitation of this study was the errors discovered in the validated MEQ survey. The directions provided to score the survey were not consistent through each domain. The researcher found that reverse scoring for several of the questions needed to occur for consistency to contribute to overall score. It is possible that previous studies did not catch this error and this could contribute to differences in findings.

Future research among college students may include a longitudinal study from the start of college to the point of graduation. As mentioned above, this research could be applied to attempting to increase the mindfulness level of college students and in turn examining how that may impact the average BMI among the entire campus. Accurate mindful eating questionnaires and scoring sheets is essential in collecting reliable data. The universal development and usage of the same questionnaire would prove to be beneficial. In order to ensure BMI levels and dietary recalls are accurate, the researchers should measure height and weight in the lab with consistent equipment. The importance of continuing research on mindful eating has the potential to impact weight maintenance in college students. The college population is crucial to instill healthy and mindful eating techniques in order to stunt the rising rates of obesity in the United States.

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