

2023

Incorporating Intuitive Eating Education: Dietetics Students' Perceptions of their Eating Behaviors, Body Esteem, and Self-Efficacy to Provide Effective Nutrition Counseling

Alessandra Sarcona
West Chester University, asarcona@wcupa.edu

Dara Dirhan
West Chester University, ddirhan@wcupa.edu

Follow this and additional works at: <https://ecommons.udayton.edu/jde>



Part of the [Dietetics and Clinical Nutrition Commons](#)

Recommended Citation

Sarcona, Alessandra and Dirhan, Dara (2023) "Incorporating Intuitive Eating Education: Dietetics Students' Perceptions of their Eating Behaviors, Body Esteem, and Self-Efficacy to Provide Effective Nutrition Counseling," *Journal of Dietetic Education*: Vol. 1: Iss. 1, Article 4.
Available at: <https://ecommons.udayton.edu/jde/vol1/iss1/4>

This Original Research is brought to you for free and open access by the School of Education and Health Sciences at eCommons. It has been accepted for inclusion in Journal of Dietetic Education by an authorized editor of eCommons. For more information, please contact mschlangen1@udayton.edu, ecommons@udayton.edu.

Original Research

Incorporating Intuitive Eating Education: Dietetics Students' Perceptions of their Eating Behaviors, Body Esteem, and Self-Efficacy to Provide Effective Nutrition Counseling

Alessandra Sarcona, West Chester University
Dara Dirhan, West Chester University

ABSTRACT

Intuitive eating (IE), an evidence-based, weight-inclusive, hunger-based, and mind-body health approach, is critical for dietitians to know and practice when working with clients to manage their health. Yet, many dietitians are not familiar with the practice of IE, stemming from a lack of training in their dietetics curriculum. The purpose of this mixed-methods study was to investigate the outcomes of creating pedagogical activities incorporating IE education into a senior-level Professional Skills in Dietetics course (Intervention Group [IG]) on students' eating behaviors, body esteem, and self-efficacy to provide effective nutrition counseling and compare it to junior-level dietetics students in a course not receiving the IE education (Control Group [CG]). Sixty-seven students completed the pre- and post-survey including the Intuitive Eating Scale-2 and Body-Esteem Scale for Adolescents and Adults. Students in the IG showed significant improvements in IE scores pre-to post-course, and there was a significant difference in IE post scores between IG and CG; however, the post-pre-IG versus post-pre-CG scores for IE and body esteem showed no significance. High IE scores among IG were associated with higher levels of body esteem, and no correlation was found within the CG. This study also noted the IG embraced IE principles, which led them to have a more positive relationship with food and increased their self-efficacy to be more effective nutrition counselors. Dietetics programs have a unique opportunity to include the topic of IE in any number of existing courses in the dietetics curriculum. As such, teaching about IE in the undergraduate dietetics curriculum and providing community-engaged learning for students to apply this skill prepares students to be effective nutrition counselors as future dietitians.

INTRODUCTION

Intuitive Eating (IE) is an evidenced-based, mind-body health approach, comprised of 10 Principles created by two dietitians, Evelyn Tribole and Elyse Resch, and is a weight-inclusive, hunger-based approach to eating.¹ Interoceptive awareness is the foundation for IE and is described as, “The ability to perceive physical sensations that arise from within our body.”^{1(p3)} Overall, being an intuitive eater can increase one’s interoceptive awareness, and specifically, these IE principles aim to improve interoceptive awareness: honor your hunger; respect your fullness; discover the satisfaction factor; and movement – feel the difference, and these IE principles can help remove obstacles to interoceptive awareness: reject the diet mentality; make peace with food; challenge the food police; cope with your emotions with kindness; respect your body; and honor your health with gentle nutrition.¹ Applying the IE principles can be used by registered dietitian nutritionists (RDNs) whose core practice is to educate individuals on healthful dietary and lifestyle behaviors to better manage their health. Students majoring in dietetics are aiming to become RDNs and therefore need to practice appropriate nutrition counseling skills. Dietary consultation that uses restrictive food plans that are externally driven has been shown to cause client resistance.² In recent years, IE has been supported by RDNs and has become more prevalent concerning current diet trends. It is thought to promote positive cognitive change, reduce emotional eating, and increase shape acceptance.³ The creators of IE summarize extensive research showing IE benefits that recognize it as, “An adaptive eating style, which influences positive psychological and physical well-being.”^{1(p1)}

When dietetics students begin nutrition counseling, their eating behaviors may be transferred to the client. College students are one age group that are at a higher risk for disordered eating behaviors, including dieting and unhealthy choices.⁴ In addition, a review of the literature has shown that nutrition and dietetic students have demonstrated issues

with disordered eating.⁵ Research has found that students in this major might have more restrained eating habits by restricting foods to control their weight than students in other academic majors and may enter the dietetics program to deal with their pre-existing struggles with food and disordered eating.⁶ Restrictive tendencies toward food tend to improve as students decrease their obsessive eating behavior as they advance in the course of their studies. Adding the principles of IE into the dietetics curriculum is one means to assist students in having more positive dietary behaviors, so in turn, they can assist clients in improving their lifestyle habits concerning diet. Having healthy eating behaviors that can come from IE is essential to providing non-biased nutrition counseling for others. Studies incorporating IE education among college students have found that IE practices are inversely associated with disordered eating patterns;⁷ fewer food anxieties, dieting behaviors, and greater pleasure associated with food,⁸ greater acceptance of body image and less weight-related shame;^{4,9} and less dietary restraint behaviors.^{3,4} The overall theme of these studies highlights the value of shifting the focus from restrictive diet approaches to IE practices when it comes to weight management and positive dietary behaviors.

Mobile health apps such as calorie and fitness trackers are common tools recommended by nutrition counselors to increase clients’ awareness of their food and nutrient intakes and physical activity levels. Using these apps can be counterintuitive to IE principles of allowing all foods to be part of a person’s dietary intake. Tracking calories and physical activity have been shown to worsen eating disorder symptomatology,¹⁰⁻¹⁶ create obsession around food and calories, and cause guilty feelings when food and fitness goals are not achieved.¹⁷ These tools when used appropriately can be tailored to the needs of specific users and must be part of the conversation when educating dietetics students in nutrition counseling.

It is important that students entering the dietetics profession, overcome their negative issues with food so that they can be more competent and confident in helping others improve their eating behaviors. Bandura's social-cognitive behavior theory (SCT) was applied, as it relates to self-efficacy, where Bandura defined self-efficacy as "people's judgements of their capabilities to organize and execute courses of action required to attain designated types of performances."^{18(p391)} Self-efficacy is a major component of Bandura's social-cognitive theory, which contends that behavior is strongly stimulated by self-influence.¹⁸ A study that applied Bandura's theory to the work environment, reported that employees who exhibited higher levels of self-efficacy for their tasks showed improved performance.¹⁹ This works through people's beliefs in their capabilities to affect the environment and produce desired outcomes by their actions.¹⁹ Having students practice counseling skills and providing additional tools such as IE that can be incorporated into nutrition counseling sessions are factors that aim to increase students' confidence in delivering effective nutrition counseling. Therefore the purpose of this study was to investigate the outcomes of creating pedagogical activities incorporating IE education into a senior-level Professional Skills in Dietetics course (Intervention Group [IG]) on students' eating behaviors and body esteem, and self-efficacy to provide effective nutrition counseling, and compare it to junior-level nutrition students in a course, Strategies in Dietetics Education, not receiving the IE education (Comparison Group [CG]). It was hypothesized that the IG will have improved IE scores and these students will have more self-efficacy toward being effective nutrition counselors at the conclusion of the course. It was also hypothesized that the IG will have higher scores for IE and better body esteem compared to students in the CG who do not receive education on IE.

METHODS

A mixed-methods quasi-experimental and qualitative approach (validated questionnaires and open-ended responses) were utilized to evaluate the outcomes of the study.

Quantitative analysis was used to evaluate the following research questions:

RQ1: What is the difference between dietetics students' intuitive eating (IE) practices and perceived body esteem, pre-and post-course among students who complete the IE curriculum in the Professional Skills in Dietetics course (Intervention Group [IG]) and students in Strategies in Dietetics Education course (Comparison Group [CG]) who are not exposed to the IE intervention?

RQ2: What is the relationship between body esteem and IE, pre-and post-course among dietetics students who complete the IE curriculum in IG compared to students in CG who are not exposed to the IE intervention?

Mixed methods analysis was used to evaluate this research question:

RQ3: How does IE affect dietetics students' recommendations to clients and personal use of a mobile health app, such as a calorie or fitness tracker among the IG?

A phenomenological qualitative approach was used to evaluate IG attitudes and perceptions of open-ended questions after being exposed to IE to generate themes related to the following:

RQ4: What are dietetics students' perceptions of learning about IE in the IG relative to their self-efficacy in being an effective nutrition counselor by the conclusion of the nutrition counseling project?

Students in a Professional Skills in Dietetics course who are required to learn and practice nutrition counseling were introduced to IE. This course uses a flipped classroom format involving engaging activities for students in the classroom and community where students meet with a real client for three nutrition counseling sessions using motivational interviewing. Adding IE to the curriculum and providing many opportunities for practicing counseling was deemed an essential component to enhance students' self-efficacy for counseling. This mixed methods research design used a sample of upper-level students enrolled as dietetics majors at a public university. Students who were mostly senior-level dietetics majors taking the Professional Skills in Dietetics course made up the IG. All students in the IG received course content related to the principles of IE. Students in the Strategies in Dietetics Education course who were mostly junior-level dietetics majors were in the CG. Each student in the IG purchased a copy of the book, *Intuitive Eating, 4th Ed., An Anti-Diet Revolutionary Approach* by, Tribole and Resch (2020).¹ There are ten main principles of IE outlined in the text. Each principle of IE looks to impact mental and physical health aspects when it comes to having a positive relationship with food and body image. A project was created in the IG that included students participating in an IE group project; each group (2-3 students) covered one IE principle from the book. The project consisted of obtaining research articles to support the topic addressed in the IE principle and developing a PowerPoint presentation to educate the class that also included an activity related to the IE principle to engage the audience. In addition to the project, the IG instructors incorporated lessons and class discussions on how to incorporate IE into their counseling sessions, including the appropriateness of recommending calorie/fitness trackers to their clients. Students were also required to complete a summary of the IE presentations, a peer review of their group members, and a reflection on the

IE experience and how IE was incorporated into their counseling sessions.

Students in the IG and CG who consented to participate in the study completed a pre-course survey during the first week of the semester and a post-course survey during the last week of the semester that was comprised of the following validated scales 1) Intuitive Eating Scale-2 (IES-2)²⁰ and 2) Body-Esteem Scale for Adolescents and Adults (BESAA).²¹ The IES-2 is a 23-item measure with subscales: Unconditional Permission to Eat; 6 items, Eating for Physical Rather than Emotional Reasons; 8 items, Reliance on Hunger and Satiety Cues; 6 items, and Body-Food Choice Congruence; 3 items. Items are measured on a Likert 1-5 scale; a higher score indicates that one is more of an intuitive eater. The BESAA is a 23-item measure with subscales, Appearance; 10 items, Attribution (positive evaluations about one's body and appearance to others); 5 items, and Weight Satisfaction; 8 items. Items are measured on a Likert 1-5 scale; a higher score on the BEESA scale indicates that one has higher body esteem. In addition to the scales, the survey included a question about the student's age range. Additional questions were asked for only the IG students, "Do you use a mobile health app such as a calorie (e.g., MyFitnessPal) or fitness tracker (e.g., Fitbit)?" which had a yes/no response; "When you provide nutrition counseling, would you recommend a mobile health app such as a calorie (e.g., MyFitnessPal) or fitness tracker (e.g., Fitbit) for your client to use?" which had a yes/no/not sure/depends on the client, as responses. The post-survey added the following questions only for the IG, "Include a general reflection about your learning experience doing the intuitive eating project" and "Comment on your self-efficacy towards counseling your client as it relates to what you have learned about intuitive eating over the semester. In other words, has learning about intuitive eating made you more confident in counseling your client? If so, why. If not, why not?" and "How do you feel about recommending a calorie and/or a fitness tracker for your client?" In addition, IG

students were asked, “How do you feel about your mobile health app? And to check any of the following that applied: I do not use a mobile health app; it helps me keep track of my exercise and food intake; it makes me neurotic about my body image; it makes me feel healthier; it helps me have a more positive body image; it interferes with my daily activities and/or social life; it makes me feel obsessive about my exercise and food intake; it helps me manage my weight better; it motivates me to eat healthier and increase my physical activity; it creates anxiety/guilt if I do not reach my exercise or food intake goals; other, specify.

The scales and the additional questions were consolidated into one survey using a Qualtrics online survey (Qualtrics XM; Qualtrics International, Provo, UT). Students were provided with the links to the survey during class time at the start of the semester and the conclusion of the semester. Institutional Review Board approval was provided by the university to conduct this study and only participants who signed the informed consent completed the survey. Students who were less than 18 years old were not able to participate in the study.

Quantitative data were analyzed for students in the IG and CG who completed both the pre-and post-survey using Statistical Package for the Social Sciences (SPSS Statistics 24.0, Chicago, IL, 2016)²² to examine scores on the IES-2 and BESAA, pre-and post-survey within the groups and between the IG and CG using a paired-samples *t*-test, Pearson product-moment correlation coefficient, independent-samples *t*-test, and a descriptive analysis of the additional survey questions. All significance levels were set at $P \leq .05$.

A phenomenological qualitative approach was used to analyze data for responses to open-ended questions, using a constant comparison method, which is an inductive process to generate theoretical explanations on the reflection responses to additional questions and students' perceptions of their counseling sessions in the IG.²³ The principal

investigator initially developed a draft of classification codes after reviewing the content from all the participant responses, which was then reviewed and revised by the second author until a consensus was achieved. The principal investigator identified the final themes and chose direct quotations that exemplified the final themes.

RESULTS

A total of 124 students were enrolled in the IG ($n = 56$) and CG ($n = 68$). Two participants were enrolled in both courses and included in the IG. Fifty-four percent of students completed the pre-and post-survey; IG ($n = 32$) and CG ($n = 35$). Out of 67 participants, the majority were between 18-25 years old ($n = 60, 92\%$) and the remainder were over 26 years of age ($n = 7, 8\%$). Since most students in the dietetics major are female, gender was not evaluated.

A paired-samples *t*-test was used to evaluate pre- and post-course mean scores on the IES-2 and BESAA to investigate the first research question, “What is the outcome of dietetics students' IE practices and perceived body esteem, pre-and post-course among students who complete the IE curriculum in the Professional Skills in Dietetics course (Intervention Group [IG]) and students in Strategies in Dietetics Education course (Comparison Group [CG]) who are not exposed to the IE intervention? Both groups showed improvement in their scores as outlined in Table 1. There was a statistically significant increase in IE scores for the IG. The mean increase in IE scores was 5.09 and the eta squared statistic (.36) indicated a large effect size. The CG also showed a statistically significant increase in IE scores, from the start of the semester to the end of the semester. The mean increase in IE scores was 3.63 and the eta squared statistic (.11) indicated a large effect size but not as high as the IG. There was no significant change in body esteem scores for the IG, from the start of the semester to the end of the semester. The CG also showed a statistically significant increase in body esteem

Table 1. Pre-and-post intuitive eating and body esteem scores for intervention group and comparison group

Instrument	Intervention Group (n = 32)		Comparison Group (n = 35)	
	Mean ± SD ^a	P value	Mean ± SD	P value
Intuitive Eating Score^b				
Pre-Course	80.00 ± 11.46		76.31 ± 8.80	
Post-Course	85.09 ± 11.45	0.000 ^d	79.94 ± 7.26	0.049 ^d
Body Esteem Score^c				
Pre-Course	75.84 ± 16.90		73.49 ± 7.82	
Post-Course	78.84 ± 16.19	0.125	77.09 ± 8.03	0.030 ^d

^aAll values are Mean ± Standard Deviation (SD)

^bIntuitive Eating Scale (IES-2) uses a Likert 1-5 scale for 23-items; total scores range from 1 to 115; a higher score indicates that one is more of an intuitive eater

^cBody-Esteem Scale for Adolescents and Adults (BESAA) uses a Likert 1-5 scale for 23-items; total scores range from 1 to 115; a higher score indicates that one has greater body esteem

^d $p \leq .05$ significant

scores, from the start of the semester to the end of the semester. The mean increase in body esteem scores was 3.60 and the eta squared statistic (.13) indicated a large effect size. See Table 1.

To investigate if there was a relationship between IE and body esteem post-course scores for each group, the Pearson product-

moment correlation coefficient was conducted. For the IG (n = 32) there was a moderate, positive correlation between the two variables, $r = .42$, $P = 0.016$, with high IE scores associated with higher levels of body esteem. Evaluating scores for the CG found there was no correlation between the two variables, $r = .05$, $P = 0.77$.

Table 2. Comparison of intuitive eating and body esteem scores between intervention group and comparison group

Instrument	Intervention Group (n = 32)	Comparison Group (n = 35)	
	Mean Difference ± SD ^a	Mean ± SD	P value
Intuitive Eating Score^b			
Post-Course	85.09 ± 11.45	79.94 ± 7.26	0.034 ^d
Intuitive Eating Score			
Post-pre-Difference	5.09 ± 6.88	3.51 ± 6.20	0.329
Body Esteem Score^c			
Post-Course	78.84 ± 16.19	77.06 ± 8.03	0.582
Body Esteem Score			
Post-pre-Difference	3.69 ± 10.54	3.69 ± 5.85	0.999

^aAll values are Mean ± Standard Deviation (SD)

^bIntuitive Eating Scale (IES-2) uses a Likert 1-5 scale for 23-items; total scores range from 1 to 115; a higher score indicates that one is more of an intuitive eater

^cBody-Esteem Scale for Adolescents and Adults (BESAA) uses a Likert 1-5 scale for 23-items; total scores range from 1 to 115; a higher score indicates that one has greater body esteem

^d $p < .05$ significant

Table 3. Mobile health app use and recommendation for counseling (n = 32)

	Pre-course IG ^a		Post-course IG	
	Frequency	Percent	Frequency	Percent
Do you use a mobile health app, such as a calorie or fitness tracker?				
Yes	13	41%	7	22%
No	19	59%	25	78%
When you provide nutrition counseling, would you recommend a mobile health app?				
Yes	2	6.3%	5	15.6%
No	2	6.3%	4	12.5%
Not sure	3	9.4%	3	9.4%
Depends on the client	25	78.1%	20	62.5%

^aIG=Intervention Group

An independent sample *t*-test evaluated the pre- and post-course mean scores on the IES-2 and BESAA to evaluate the second research question, “What is the relationship between body esteem and IE pre-and post-course among dietetics students who complete the IE curriculum in IG compared to students in CG who are not exposed to the IE intervention?” As outlined in Table 2, there was no significance comparing body esteem post scores between IG and CG; however, there was a significant difference in IE post scores between IG and CG. The magnitude of the differences in the means (mean difference = 5.15) showed a moderate effect (eta squared = .07). Since the two groups started with different baseline scores, the post-pre change in each group was compared and it was found there were no significant differences for IES-2 and BESAA scores between the two groups; see Table 2.

A mixed-method approach was used to evaluate the third research question, “How does IE affect dietetics students’ recommendations to clients and personal use of a mobile health app, such as a calorie or fitness tracker among the IG?” Descriptive statistics were used to evaluate the personal use of trackers among the IG. Table 3 shows

there was a 19% decrease in the use of a calorie or fitness tracker post-course in IG. Responses to “When you provide nutrition counseling, would you recommend a mobile health app such as a calorie or fitness tracker?” can be seen in Table 2. Most of the students in the post-course IG noted that it depends on the client.

An independent samples *t*-test was used to evaluate the mean scores from the IES-2 for users of mobile health apps and non-users of mobile health apps post-course in the IG. There was a statistically significant difference in IE scores among users of a mobile health app such as a calorie or fitness tracker and IE scores (78.28 ± 8.60) and IE scores for non-users (87.00 ± 11.56); *P* = 0.048 (two-tailed). The magnitude of the differences in the means (8.71) was large (eta squared = .14).

When asked an open-ended question, “How do you feel about recommending a calorie and/or a fitness tracker for your client?” the students were able to further explain their response to the previous question, “When you provide nutrition counseling, would you recommend a mobile health app such as a calorie or fitness tracker?” Emergent themes, descriptions, and sample quotes from the post-course intervention group were outlined in

Table 4. Consistent with the multiple-choice response, most students noted that it depends on the client. Students also elaborated on the negative and positive aspects of using a calorie and/or fitness tracker after learning about intuitive eating; see Table 4.

Qualitative themes were generated for the open-ended questions relative to the following: IG students' perceptions of learning about IE relative to their self-efficacy in being an effective nutrition counselor by the conclusion of the nutrition counseling project; their

reflections about the learning experience doing the IE project; and their perceived self-efficacy towards counseling their clients as it related to what they learned about IE over the semester. Four common themes were derived from IG participants' responses: 1) IE project well-received by dietetics students, 2) IE as an important tool for nutrition counseling, 3) IE as an integral concept for nutrition and dietetics professionals, 4) IE personally relative to dietetics students, as outlined in more detail in Table 5.

Table 4. Emergent themes, descriptions, and sample quotes from post-course intervention group' qualitative responses about recommending a mobile health app when counseling a client (n = 32)

Theme	Summary	Representative Quotes
Depends on the client	<ul style="list-style-type: none"> Consider clients' history and their goals. Use apps in a healthier way based on the client. 	(ID#130) "If a client is unaware of calorie and nutrient amounts and does not have a history of disordered eating, then yes, tracking calories for a period of time can be beneficial; however, the goal would be to eventually not need to track calories and learn off of other cues such as physical symptoms of hunger."
Negative aspects of calorie and/or fitness trackers	<ul style="list-style-type: none"> Would not recommend. Can make the client obsessive about food/calorie intake and/or weight. Can create anxiety/guilt if clients do not reach their exercise or food intake goals. Will worsen disordered eating. 	<p>(ID#107) "I would not want any of my clients to become obsessed with calorie counting or fitness levels because this can become destructive."</p> <p>(ID#126) "It can lead to feeling shame when you consume too many calories and can also lead to obsessive and disordered thoughts around food and exercise."</p> <p>(ID#128) "Clients who are only looking to lose weight due to the fact that they do not like their appearance, should stay away from a calorie counter."</p>
Positive aspect of calorie and/or fitness trackers	<ul style="list-style-type: none"> Would recommend. Help client be aware of food intake and what to improve. Can motivate client to eat healthier and/or increase physical activity. 	<p>(ID#114) "For certain clients, it's a great tool to learn portion awareness and understanding your body's needs."</p> <p>(ID#119) "Can be a good tool to understand what parts of your eating habits you need to improve."</p>

Table 5. Emergent themes, descriptions, and sample quotes from post-course intervention group' qualitative responses about their learning experience doing the intuitive eating project (n = 32)

Theme	Summary	Representative Quotes
Intuitive Eating (IE) project well-received by dietetics students	<ul style="list-style-type: none"> Recognized IE principles as a useful and important concept. Enjoyed participating in the IE Project and reading the book. Enjoyed working in a group and listening to the IE presentations. Learned a lot about IE and its principles. 	<p>(ID #103) "Intuitive Eating is such a powerful message because it is going against what our culture tells us to do and instead listening to what our body is telling us to do."</p> <p>(ID # 131) "I really loved the intuitive eating project and I feel that I got an in-depth understanding of my own principle and a solid understanding of the other principles as well. This was probably my favorite project in the nutrition program."</p>
IE as an important tool for nutrition counseling	<ul style="list-style-type: none"> Increased self-efficacy to be a more effective counselor. Added to student's skill set to help clients reach their personal goals. Helped improve personal food and weight issues and now better able to help others. 	(ID#108) "Learning about intuitive eating has made me more confident in counseling a client because I have become aware that nutrition counseling is more than just telling people what to eat or what not to eat. Nutrition counseling consists of building a strong relationship with the client and creating a plan that will help the client fulfill his/her nutritional goals."
IE as an important concept for nutrition and dietetics professionals	<ul style="list-style-type: none"> Recognized importance for dietitians to know and use these IE as a future practitioner. Provided a solid evidence-based approach to nutrition care. Conflicted with concepts learned in other dietetics' courses. 	<p>(ID#112) "I have learned valuable skills that can be incorporated into my nutrition counseling as a future dietitian."</p> <p>(ID#129) "Intuitive eating is good for future nutrition professionals to realize that this truly is an evidence-based approach."</p>
IE personally relative to dietetics students	<ul style="list-style-type: none"> Provided tools to practice IE in their personal life. Realized their unhealthy relationship with food and/or poor body image. 	<p>(ID#104) "Intuitive eating gave me a whole new outlook on eating. It taught me a lot about myself and showed me I have a lot of improvement to do, so I can better my body and self-esteem. Intuitive eating gave me a whole new outlook on my relationship with food and informed me on useful ways to help better my eating habits and my body."</p> <p>(ID#122) "As nutrition students, I feel like it's too easy for us to fall into orthorexia dietary patterns of only clean eating and wanting to eat healthfully, and of thinking that this type of eating is expected of us. In truth, we should be the ones modeling that a healthy dietary pattern is an all-foods-fit approach and helping to take away the fear factor of certain foods."</p>

DISCUSSION

Students in the IG showed significant improvements in IE scores pre-to post-course and there was a significant difference in IE post scores between IG and CG, which is consistent with studies that provided non-diet type interventions among dietetic college

students^{4,24} and general college students.²⁵ Interestingly, the CG also showed a significant increase in IE scores but the IG who completed the IE curriculum had significantly higher IE post-course scores; however, since each group started with different scores the post-pre-difference in scores was not significant. It is possible for both groups that other factors can

be influential during the semester, such as having a guest speaker for a student dietetic association club who is an RDN and focused on IE, and/or students may follow RDNs on Instagram who promote IE. Dietetics students may also talk to each other or have other classes together where there could be some transfer of knowledge, as well as other unidentified means for being informed about IE.

The IE intervention did not seem to significantly affect body esteem scores for the IG; however, the comparison group did see an improvement in their body esteem. Humphrey and colleagues did find that overall body esteem increased during their *Health at Every Size* (HAES) intervention; however, the authors noted that the attribution subscale, which evaluates perceptions of one's body and appearance to others did not change.⁴ This study's intervention was HAES and the current study focused solely on IE and not directly on weight but did elaborate on one of the IE principles, *Respect Your Body*. The authors noted the sensitive nature of body esteem among college students may not be best addressed in group settings.⁴ This study displayed a correlation within the IG post-course, that high IE scores among participants were associated with higher levels of body esteem, and no correlation was revealed within the CG between the two variables. Other studies also found higher levels of IE were associated with greater body appreciation and satisfaction among college students.²⁵⁻²⁸ IE may be a protective factor for college women experiencing weight-related shame.⁹ In a systematic review of 24 studies, IE was associated with a more positive body image in adult women.²⁹

Having learned about IE in the IG, and those showing a higher IE score resulted in a lower frequency of using a calorie or fitness tracker. IE has a focus on 'all foods can fit' and anti-dieting and using a calorie tracker can be counterintuitive to this approach. Mobile health apps such as calorie and fitness trackers were addressed in the IG course relative to their role when counseling a client on nutrition

concerns. In their response to the question in the survey about recommending a mobile health app when providing nutrition counseling, more than half the students noted that it depends on the client. When they elaborated on the topic in their short response, an overall theme was the need to consider the clients' history and weight goals and to use these tools more healthfully based on the client. A systematic review of nutrition apps outlined numerous positive and negative outcomes from the use of nutrition apps and the researchers suggested tailoring nutrition apps to the needs of specific user groups.³⁰ Some common themes that came from students about the negative aspects of calorie and/or fitness trackers include: they can make the client obsessive about food/calorie intake and/or weight, and can create anxiety/guilt if clients do not reach their exercise or food intake goals. These undesirable features that participants noted about using these apps are consistent with another study that evaluated subjects' dislikes of using mobile health apps.¹⁷ Users who regularly monitor calorie intake and exercise are at risk to experience dietary restraint and eating concerns, and this showed as another theme that participants noted, will worsen disordered eating. Individuals recovering from eating disorders are advised to refrain from using any calorie or fitness-tracking apps. Several studies noted that eating disorder symptomatology worsens when users engage with mobile health apps that track calories and or exercise.¹⁰⁻¹⁶ Specifically, calorie-counting apps, such as MyFitnessPal®, fueled disordered eating behaviors^{10,12-14} and fostered feelings of comparison and guilt.¹¹ One study, however, found evidence suggesting that calorie counting and fitness-tracking applications do not pose risk for worsening eating disorder symptomatology and disordered exercise behaviors.³¹ Students noted positive aspects of using a calorie and/or fitness tracker such as helping the client be aware of food intake and what to improve, which can motivate the client to eat healthier and/or increase physical activity. Mobile health apps can assist individuals in changing eating

behavior and diet-related health risk factors,³⁰ and can facilitate healthy diets.^{17,32} As advised in the Professional Skills in Dietetics course, when counseling a client, motivational interviewing helps clients create their goals and requires the counselor to meet the client where they are and provide individual guidance. This concept can certainly apply by combining IE strategies and the appropriate use of a calorie/fitness tracker.

A theme derived from the qualitative data highlighted that students recognized IE principles as a useful and important concept and enjoyed participating in the IE project and reading the book *Intuitive Eating, 4th Ed., An Anti-Diet Revolutionary Approach* by Tribole and Resch.¹ Most students in the IG reported that they were provided the opportunity to apply the IE strategies learned in the course to their nutrition counseling sessions. Almost all students in the IG described in their reflection on their counseling experience, that learning about IE increased their self-efficacy to be more effective counselors. When Bandura's SCT was applied to the work environment, higher levels of self-efficacy lead to improved performance.¹⁹ Bandura outlines how self-efficacy operates in concert with socio-cognitive determinants represented by SCT in determining human motivation.¹⁸ And although students' counseling performance was graded, their actual performance was not measured in this study; however, it is the intent that students' attaining more perceived confidence in their counseling skills at the onset will enable them to be more motivated to continue to enhance their skill set as a nutrition counselor. There is a gap in the research evaluating how IE can relate to counseling skills, especially related to students in a service-learning or community-engagement situation, where they work with individuals in the community to conduct nutrition counseling. Other themes that evolved from the study included that IE added to students' skill sets to help clients reach their personal goals and learning about IE helped them improve their food and weight issues to better help

others. Research has shown that nutrition and dietetics students have more restrained dietary behaviors than students in other fields of study,⁶ and have more issues with disordered eating.⁵ Individuals with eating disorders may be more compelled to become interested in a career in the field of nutrition.³³ One student in the IG commented that nutrition students can easily fall into orthorexia dietary patterns of only clean eating and wanting to eat healthfully, and thinking that this type of eating is expected. Tremelling and colleagues reported a high prevalence of Orthorexia Nervosa among RDNs.³⁴ Students in the IG found the IE curriculum helped provide tools for them to practice IE in their life and helped them realize their unhealthy relationship with food and/or poor body image. These findings are consistent with other studies that provided non-diet interventions similar to IE among college students and reported outcomes that IE practices are inversely associated with disordered eating patterns;^{7,24} and more positive eating behaviors.^{3-4,8} In general, research has shown that higher levels of IE contributed to a decrease in disordered eating behaviors among college students.³⁵⁻³⁶ A few students commented that learning about IE conflicted with concepts learned in other dietetics courses such as medical nutrition therapy (MNT). Research is limited in the area of using IE in nutrition counseling for chronic diseases such as diabetes instead of using restrictive diets. Studies have not shown strong evidence of IE and improved health indicators such as blood pressure and serum cholesterol,³⁷⁻³⁸ or systolic blood pressure and fasting glucose between low and high intuitive eaters,³⁹ although IE was found to be negatively associated with body mass index, and positively associated with various psychological health indicators.³⁸ These studies are cross-sectional and health information was self-reported.³⁷⁻³⁹ One study reported that individuals with type 2 diabetes mellitus who had higher IE scores were associated with lower chances of presenting inadequate glycemic control.⁴⁰ There is scant research on

HAES and health outcomes. HAES and IE complement each other since the dietary and weight management components of HAES interventions are grounded in IE principles.⁴¹ HAES is documented in the literature as an enhanced form of IE, shifting the restrictive diet weight loss paradigm for treating obesity to more of a health-centered paradigm.⁴² In a study of obese, female, chronic dieters, a six-month HAES program intervention versus a diet approach program demonstrated long-term behavior change, size acceptance, reduction in dieting behavior, and improved health risk indicators among the HAES intervention group, but not in the diet group.⁴³ Additional research is needed on the causal relationship between IE and improved health, particularly in the longer term, and can be incorporated into medical nutrition therapy courses. Future research should examine HAES and IE, in tandem, as health promotion paradigms in counseling and intervention to improve health and can be incorporated into obesity courses and nutrition counseling courses.

Limitations of the study include the small convenience sampling at one university. Pre- and post-surveys do not account for other intervening factors in addition to the intervention of providing an IE curriculum. As such, students in both the CG and IG may have had previous exposure to IE from social media influencers, other dietetics students, guest speakers in clubs or other classes, or exposure through independent study and research. Only 54% of students initially enrolled in the courses completed the pre- and post-survey. The study included mostly females but did not evaluate gender and consider other gender identities.

IMPLICATIONS FOR DIETETIC EDUCATION

Educating dietetics students about IE was intended to assist students in addressing their own negative eating behaviors, so they are better equipped to help clients with their dietary practices. Having students go beyond the classroom into the community to counsel a

client provided real-world experience. This type of community-engaged learning format where students counsel clients in their community in conjunction with the IE curriculum allowed the students to practice IE strategies in a real-world setting and may have led to enhanced self-efficacy toward being effective nutrition counselors.

The qualitative findings revealed that incorporating the principles of IE into the dietetics curriculum appeared to promote more positive dietary behaviors in their personal lives, so in turn, they can assist clients in improving their lifestyle habits concerning diet. Incorporating the principles of IE is an especially complimentary insertion in the dietetics curriculum where nutrition counseling is taught and is supported by the 2022 ACEND Standards for Didactic Programs, especially Standard 3 (Curriculum and Learning Activities).⁴⁴ Required element 3.1. states that, “The program’s curriculum must be designed to ensure the breadth and depth of requisite knowledge needed for entry to supervised practice to become a registered dietitian.”^{44(p9)} Further, this required element includes points 3.1.a.2 and 3.1.a.3, which say that “The program’s curriculum must include the following required components, including prerequisites: communication and documentation skills sufficient for entry into professional practice” (3.1.a.2) and “Principles and techniques of effective education, counseling and behavior change theories and techniques” (3.1.a.3).^{44(p9)} Including IE in the undergraduate curriculum provides another piece of breadth and depth in teaching nutrition counseling to dietetics students and allows them to become familiar with IE and its principles, and to apply IE during nutrition counseling sessions. Additionally, the inclusion of IE is supported by KRDN 3.3, which states, “Upon completion of the program, graduates are able to demonstrate counseling and education methods to facilitate behavior change and enhance wellness for diverse individuals and groups.”^{44(p11)} Having healthy eating behaviors that can come from IE is essential to providing non-biased nutrition

counseling for others. IE can also be infused into other dietetic courses, and educators who use IE in MNT are encouraged to research their outcomes and address the limitations of this study. Future studies can expand the components of this study to strengthen the evidence for including IE in the dietetics curriculum. Undergraduate dietetics education programs should consider the benefits of including IE in the curriculum, both for students, personally, and as future nutrition and dietetics practitioners.

CONFLICTS OF INTEREST

The authors report no conflicts of interest.

REFERENCES

1. Tribole E, Resch E. *Intuitive eating: A Revolutionary anti-diet approach*. 4th edition. New York: St. Martin's Publishing Group; 2020.
2. Foster GD, Makris AP, Bailer BA. Behavioral treatment of obesity. *Amer J of Clin Nutr*. 2005;82(1 Suppl):230S-235S.
3. Anderson LM, Reilly, EE, Schaumberg K, et al. Contributions of mindful eating, intuitive eating, and restraint to BMI, disordered eating and meal consumption in college students. *Eat Weight Disord*. 2016;21:83-90. doi:10.1007/s40519-015-0210-3
4. Humphery L, Clifford D, Neyman M, et al. Health at every size college course reduces dieting behaviors and improves intuitive eating, body esteem, and anti-fat attitudes. *J Nutr Educ Behav*. 2015;47:354-60. doi: <https://doi.org/10.1016/j.jneb.2015.01.008>
5. Mahn HM, Lordly D. A review of eating disorders and disordered eating amongst nutrition students and dietetics professionals. *Can J Diet Prac Res*. 2015;76:38-43. doi:<https://doi.org/10.3148/cjdpr-2014-031>
6. Korinath A, Schiess S, Westenhofer, J. Eating behavior and eating disorders in students of nutrition sciences. *Pub Health Nutr*. 2009;13:32-7. doi:<https://doi.org/10.1017/S1368980009005709>
7. Denny KN, Loth K, Eisenberg ME, et al. Intuitive eating in young adults. Who is doing it, and how is it related to disordered eating behaviors? *Appetite*. 2013;60:13-9. doi:<https://doi.org/10.1016/j.appet.2012.09.029>
8. Smith T, Hawks S. Intuitive eating, diet composition, and the meaning of food in healthy weight promotion. *Amer J Health Educ*. 2006;37:130-36. doi:<https://doi.org/10.1080/19325037.2006.10598892>
9. Craven M, Fekete E. Weight-related shame and guilt, intuitive eating and binge eating in female college students. *Eating Behav*. 2019;33:44-8. doi:<https://doi.org/10.1016/j.eatbeh.2019.03.002>
10. Bandura A. *Social foundation of thought and action: A social-cognitive view*. Englewood Cliffs, NJ: Prentice-Hall; 1986.
11. Harrison AW, Rainer RK, Hochwarter WA, et al. Testing the self-efficacy-performance linkage of social-cognitive theory. *J Soc Psychol*. 2010;137(1):79-87. doi:10.1080/00224549709595415.
12. Tylka T. Development and psychometric evaluation of a measure of intuitive eating. *J Couns Psychol*. 2006;53:226-240. doi:<https://doi.org/10.1037/0022-0167.53.2.226>
13. Mendelson BK, Mendelson M, White, DR. The body-esteem scale for adolescents and adults *J Pers Assess*. 2001;76(1):90-106. doi:10.1207/S15327752JPA7601_6
14. IBM Corp. Released 2016. IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp.
15. Caferoglu Z, Toklu H. Intuitive eating: associations with body weight status and eating attitudes in dietetic majors. *Eat Weight Disord*. 2022;27:683-692. doi:<https://doi.org/10.1007/s40519-021-01206-4>
16. Wilson RE, Marshall RD, Murakami JM, Latner JD. Brief non-dieting intervention increases intuitive eating and reduces dieting intention, body image dissatisfaction, and anti-fat attitudes: A randomized controlled trial. *Appetite*. 2020;148:104556. doi:10.1016/j.appet.2019.104556
17. Kelly AC, Stephen E. A daily diary study of self-compassion, body image, and eating behavior in female college students. *Body Image*. 2016;17:152-60. doi:<https://doi.org/10.1016/j.bodyim.2016.03.006>
18. Iannantuono AC, Tylka TL. Interpersonal and intrapersonal links to body appreciation in college women: An exploratory model. *Body image*. 2012;9:227-235. doi:10.1016/j.bodyim.2012.01.0
19. Stapleton, PB, Nikalje, A. Constructing body image in university women: the relationship between self-esteem, self-compassion, and intuitive eating. *Int J Heal Caring*. 2013;13(2):1-20.
20. Bruce LJ, Ricciardelli LA. A systematic review of the psychosocial correlates of intuitive eating among adult women. *Appetite*. 2016;96:454-72. doi:<https://doi.org/10.1016/j.appet.2015.10.012>
21. König LM, Attig C, Franke T, Renner B. Barriers to and facilitators for using nutrition apps: systematic review and conceptual framework. *JMIR mHealth and uHealth*. 2021;9(6):e20037. doi:10.2196/20037
22. Sarcona A, Kovacs L, Wright J, Williams C. Differences in eating behavior, physical activity, and health-related lifestyle choices between users and

- nonusers of mobile health apps. *Am J Health Educ.* 2017;48(5):298-305. doi:10.1080/19325037.2017.1335630
23. Pope C, Ziebland S, Mays N. Qualitative research in health care. Analysing qualitative data. *BMJ.* 2000;320:114-116.
 24. Eikev EV, Reddy MC, Booth KM, Kvasny L, Blair JL, Li V, Poole ES. (2017). Desire to be underweight: exploratory study on a weight loss app community and user perceptions of the impact on disordered eating behaviors. *JMIR MHealth and UHealth*, 5. doi:https://doi.org/10.2196/mhealth.6683.
 25. Honary M, Bell BT, Clinch S, Wild SE, McNaney R. Understanding the role of healthy eating and fitness mobile apps in the formation of maladaptive eating and exercise behaviors in young people. *JMIR mHealth and uHealth.* 2019;7(6):e14239. doi:https://preprints.jmir.org/preprint/14239
 26. Levinson CA, Fewell L, Brosco LC. MyFitnessPal calorie tracker usage in the eating disorders. *Eat Behav.* 2017;27:4-16. doi: https://doi.org/10.1016/j.eatbeh.2017.08.003
 27. Linardon J, Messer M. MyFitnessPal usage in men: associations with eating disorder symptoms and psychosocial impairment. *Eat Behav.* 2019;33:13-17. doi:https://doi.org/10.1016/j.eatbeh.2019.02.003
 28. McCaig D, Elliott MT, Prnjak, K, Walasek, L, Meyer, C. Engagement with MyFitnessPal in eating disorders: Qualitative insights from online forums. *Int J Eat Disord.* 2020;53:404-11. doi:https://doi.org/10.1002/eat.23205
 29. Plateau CR, Bone S, Lanning E, Meyer C. Monitoring eating and activity: links with disordered eating, compulsive exercise, and general wellbeing among young adults. *Int J Eat Disord.* 2018;51(11):1270-6. doi:https://doi.org/10.1002/eat.22966
 30. Simpson CC, Mazzeo SE. Calorie counting and fitness tracking technology: associations with eating disorder symptomatology. *Eat Behav.* 2017;26:89-92. doi:https://doi.org/10.1016/j.eatbeh.2017.02.002.
 31. Jospe, MR, Brown RC, Williams SM, Roy M, Meredith-Jones KA, Taylor RW. Self-monitoring has no adverse effect on disordered eating in adults seeking treatment for obesity. *Obes Sci Pract.* 2018;4:283-88. doi:https://doi.org/10.1002/osp4.168
 32. De Cock N, Vangeel J, Lachat C, Beullens K, Vervoort L, Goossens L, Maes L, Deforche B, De Henauw S, Braet C, Eggermont S, Kolsteren P, Van Camp J, Van Lippevelde W. Use of fitness and nutrition apps: associations with body mass index, snacking, and drinking habits in adolescents. *JMIR Mhealth Uhealth.* 2017;5(4):e58. doi: 10.2196/mhealth.6005
 33. Lordly D, Dubé N. The who, what, when, and how of choosing a dietetics career. *Can J Diet Pract Res.* 2012;73(4):169-75. doi: 10.3148/73.4.2012.169.
 34. Tremelling K, Sandon L, Vega GL, McAdams CJ. Orthorexia nervosa and eating disorder symptoms in registered dietitian nutritionists in the United States. *J Acad Nutr Diet.* 2017;117(10):1612-7. doi:https://doi.org/10.1016/j.jand.2017.05.001
 35. Gan WY, Yeoh WC. Associations between body weight status, psychological well-being and disordered eating with intuitive eating among Malaysian undergraduate university students. *Int J Adolesc Med Health.* 2020;32(2). doi:https://doi.org/10.1515/ijamh-2017-0095
 36. Romano KA, Swanbrow Becker MA, Colgary CD, Magnuson A. Helpful or harmful? The comparative value of self-weighing and calorie counting versus intuitive eating on the eating disorder symptomology of college students. *Eat Weight Disord.* 2018;23:841-848. doi:https://doi.org/10.1007/s40519-018-0562-6
 37. Van Dyke N, Drinkwater EJ. Intuitive eating is positively associated with indicators of physical and mental health among rural Australian adults. *Aust J Rural Health.* 2022. doi:https://doi.org/10.1111/ajr.12856
 38. Van Dyke N, Drinkwater EJ. Relationships between intuitive eating and health indicators: literature review. *Public Health Nutr.* 2014;17:1757-1766. doi:10.1017/S1368980013002139
 39. Keirns NG, Hawkins MA. Intuitive eating, objective weight status and physical indicators of health. *Obes Sci Pract.* 2019;5(5):408-15. doi:https://doi.org/10.1002/osp4.359
 40. Soares, FLP, Ramos, MH, Gramelisch M, et al. Intuitive eating is associated with glycemic control in type 2 diabetes. *Eat Weight Disord.* 2021;26:599-608, 2021. doi:10.1007/s40519-020-00894-8
 41. Carbonneau E, Begin C, Lemieux S, et al. A health at every size intervention improves intuitive eating and diet quality in Canadian women. *Clin Nutr.* 2017;36:747-54. doi: https://doi.org/10.1016/j.clnu.2016.06.008
 42. Cadena-Schlam L, Lopez-Guimera G. Intuitive eating: an emerging approach to eating behavior. *Nutr Hosp.* 2015;31:995-1002. doi:10.3305/nh.2015.31.3.7980
 43. Bacon L, Stern JS, Van Loan MD, et al. Size acceptance and intuitive eating improve health for obese, female chronic dieters. *J Am Diet Assoc.* 2005;105:929-36. doi: https://doi.org/10.1016/j.jada.2005.03.011
 44. 2022 ACEND Standards for Didactic Programs. Released 2021. 1-18. doi: https://www.eatrightpro.org/-/media/eatrightprofiles/acend/accreditation-standards/2022-standards-and-templates/2022standardsdpd-82021-3.pdf?la=en&hash=64078607C480EB7FA911012F7E27FAE306A5A543