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ORIGINAL ARTICLE

Contributions of mindful eating, intuitive eating, and restraint to BMI, disordered eating, and meal consumption in college students

Lisa M. Anderson[1] · Erin E. Reilly[1] · Katherine Schaumberg[1,2] · Sasha Dmochowski[1] · Drew A. Anderson[1]

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Abstract
Purpose Mindful eating and intuitive eating are promoted as means to circumvent potentially maladaptive dietary restraint while maintaining a healthy weight. Although theoretically related, no studies have examined the correlations between intuitive eating, mindful eating, and restraint in the same sample. This study sought to examine these constructs and their correlations with body mass index (BMI), eating-disordered behaviors, and meal consumption in a college sample.
Methods Participants ($N = 125$) completed a laboratory taste-test meal and measures of each eating-related construct using the EDDS, IES, MEQ, and TFEQ-Restraint Subscale.
Results Mindful eating, intuitive eating, and restraint were not strongly correlated. Hierarchical multiple regression analyses indicated that restraint and intuitive eating accounted for significant variance in disordered eating and BMI. Elevated restraint was associated with increased BMI and disordered eating; elevated intuitive eating was associated with decreased BMI and disordered eating. Mindful eating did not correlate with any outcome variables. Follow-up analyses suggested that specific intuitive eating subscales accounted for unique variance in the relation between intuitive eating and disordered eating. Intuitive eating was the only construct that was significantly associated with meal consumption.
Conclusions Intuitive eating and restraint appear to be only weakly correlated, and each is differentially associated with meal consumption. Mindful eating does not appear to relate to outcome variables.

Keywords BMI · Intuitive eating · Mindful eating · Restraint · Taste-test meal · College sample

✉ Lisa M. Anderson
lmanderson@albany.edu

[1] Department of Psychology, University at Albany, State University of New York, 1400 Washington Ave., Albany, NY 12222, USA

[2] Drexel University, Philadelphia, USA

Introduction

Because eating disorders and obesity are related public health issues associated with substantial physical and psychological impairment [1, 2], research investigating the shared etiology and maintenance of these conditions is important. Past work indicates that these conditions have common mechanisms (e.g., shared genetic basis [3, 4]) and cognitive characteristics (e.g., body dissatisfaction [5]). One cognitive variable relevant to both eating disorders and obesity is restraint, or the external regulation of caloric intake [6]. Etiological models of eating disorders implicate restraint as a risk factor, positing that increased restraint predisposes individuals to disinhibited eating, binge eating, and subsequent compensatory behaviors [7–9]. Prospective research supporting restraint theories suggests that elevated restraint predicts later eating disorder symptoms [10, 11].

In contrast to etiological models of disordered eating, obesity intervention and prevention encourage use of restraint for healthy weight management [12, 13]. Theoretically, increased restraint should decrease caloric intake, mitigating obesity risk. Unfortunately, adherence to dietary plans is poor [14, 15], with one meta-analysis suggesting that dietary/lifestyle interventions result in weight loss of less than 5 kg after long-term (2–4 years) follow-up [16]. Other evidence suggests that self-identified restrained

eaters consume a similar number of calories as compared to non-restrained eaters [17, 18]. Considering research that has linked restraint with elevated eating disorder symptoms alongside research suggesting that it is not an effective long-term weight management strategy [16], approaches to healthy eating such as mindful eating and intuitive eating have been proposed, which encourage individuals to eat in response to internal hunger and satiety cues, rather than adhere to externally cued dieting guidelines. Currently, there are various dieting and non-dieting approaches available; however, it remains unclear which approaches best promote healthy weight management.

Several eating approaches have adopted "non-dieting" techniques to promote weight management while reducing emphasis on caloric restriction. For instance, mindful eating aims to apply mindfulness practices to internal sensations (i.e., physical hunger/satiety) [19] and increase present-focused awareness and non-judgmental observation of bodily sensations, cognitions, and emotions [19]. Mindful eating also decreases overeating through identification of emotional or external triggers for eating [20]. Mindfulness techniques appear useful for eating disorder treatment/prevention [20, 21] and weight management efforts [22].

Intuitive eating represents another internally driven, "non-dieting" approach. Intuitive eating emphasizes trusting internal hunger and fullness cues and giving oneself unconditional permission to eat when hungry to promote cognitive change, reduce emotional eating, and increase shape acceptance [23]. Preliminary evidence suggests that increased intuitive eating and shape acceptance improve emotional/physical health in obese women, with maintenance of positive outcomes (e.g., weight loss) over time [24]. Cross-sectional evidence from non-clinical populations also suggests that increased intuitive eating relates to lower body mass index (BMI) and decreased disordered eating [25, 26].

Both of these approaches promote eating in response to internal cues (e.g., hunger/satiety); therefore, each approach incorporates internal awareness- and acceptance-related tenets that may similarly relate to eating behaviors and BMI [27, 28]. However, distinctions between the two approaches may differentially relate to weight outcomes and eating behaviors. Mindful eating approaches (e.g., mindfulness-based eating awareness training [29]) employ traditional meditation and guided mindfulness practices that encourage awareness of sensory and interoceptive cues (i.e., satiety). In contrast, intuitive eating approaches promote a broader philosophy of changing cognitive distortions, emotional eating, and shape acceptance [23]. Noting these distinctions, it is possible that mindful and intuitive eating represent two unique ways to counter negative effects associated with dietary restraint.

The current study

The current study had three primary aims. First, we evaluated correlations between intuitive eating, mindful eating, and restraint. In line with previous research and the rationale behind each approach, we hypothesized that mindful eating and intuitive eating would positively correlate with one another and negatively correlate with restraint. Second, we examined whether these constructs accounted for significant variance within BMI and disordered eating. We hypothesized that, consistent with etiological models of eating disorders, elevated restraint would be associated with increased BMI and disordered eating [8, 9], while mindful eating and intuitive eating would link to decreased BMI and disordered eating. Lastly, we examined correlations between each construct (intuitive eating, mindful eating, restraint) and the amount of pasta eaten as an in-laboratory "taste-test" meal to assess whether levels of restraint, intuitive, and/or mindful eating accounted for the way in which participants responded to hunger cues. No a priori hypotheses were generated for this third aim of the study.

Materials and methods

Participants and procedure

Participants were undergraduates (64.4 % women, $N = 94$) from a large northeastern university. Inclusion criteria for the study were being over 18 years of age and a current student at the university. The sample ($N = 125$) consisted of young adults ($M = 19.3 \pm 1.3$ years, range = 18–24 years) who reported predominantly non-overweight BMIs ($M = 23.0 \pm 4.0$ kg/m^2, range = 13.3–36.0 kg/m^2) and self-identified as Caucasian (65.4 %), African American (13.7 %), Asian (12.4 %), multiracial (3.9 %), and other (4.6 %). The sample was generally representative of the US college population [30]. After providing informed consent, participants were asked to complete a 4-h fast before attending an in-laboratory appointment during which they completed a taste-test meal (pasta and tomato sauce) and surveys regarding eating-related attitudes, behaviors, and demographics. Participants were asked by a research assistant to verbally confirm the 4-h fast completion and completed a hunger rating form to verify baseline hunger before completing the pasta/sauce

taste test. The university's Institutional Review Board approved all study procedures.

Measures

Intuitive Eating Scale (IES [31])

The IES, a 21-item scale, was used to assess levels of intuitive eating. IES assesses the three main facets of an intuitive approach to eating: Unconditional Permission to Eat when Hungry, Eating for Physical Rather than Emotional Reasons, and Reliance on Internal Hunger/Satiety Cues. The scale has shown good reliability and validity among women, as it positively relates to body acceptance and negatively relates to body dissatisfaction and pressure for thinness [32]. To date, psychometrics have not been evaluated for men. The IES evidenced good internal consistency within the current sample (Cronbach's $\alpha = .83$; subscales $\alpha = .77$–$.86$).

Mindful Eating Questionnaire (MEQ [33])

The MEQ, a 27-item self-report questionnaire, measures the degree to which individuals endorse emotional and physical awareness and acceptance while eating. Items, such as "I taste every bite of food that I eat," are rated on a Likert-type scale, ranging from 1 (never/rarely) to 4 (usually/always). MEQ scores are inversely related to BMI in community samples [33]. The scale showed fair reliability in our sample (Cronbach's $\alpha = .67$) and, in its development, showed similar reliability and convergent validity [33].

Three-Factor Eating Questionnaire: Restraint Subscale (TFEQ-R [6])

The TFEQ is a 51-item self-report survey with three validated subscales: restraint, hunger, and disinhibition [6]. The TFEQ-R subscale assessed restraint within our sample and demonstrated good internal consistency (Cronbach's $\alpha = .89$).

Eating Disorder Diagnostic Scale (EDDS [34])

The EDDS was used in the current sample to assess disordered eating. The EDDS, a 19-item self-report scale, provides an eating disorder symptom composite score. The scale has shown good internal consistency and test–retest reliability [34], which was reflected in this sample (Cronbach's $\alpha = .83$). Items from the scale, including self-reported weight and height, were also used to calculate participants' BMI (kg/m^3).

Hunger rating

To control for hunger levels, participants provided a hunger rating before beginning the in-laboratory taste test, which asked, "On a scale of 1–100, with 1 being not hungry at all and 100 being as hungry as you have ever been, how hungry are you now?"

Pasta consumption

A research assistant recorded pasta/sauce consumption using a digital food scale to weigh the prepared food before and after the participant completed the taste test. Pasta/sauce consumption was measured in ounces.

Analytic plan

Data analyses reflected the three hypotheses of the experiment. In the following analyses, hunger was entered as a covariate, IES, MEQ, and TFEQ-R scores were entered as exposure variables, and BMI, EDDS scores, and pasta consumption were identified as the outcome variables. Because prior research has demonstrated gender differences on various measures of interest, including lower scores on eating disorder risk factors such as the TFEQ-R subscale [35] and higher levels of intuitive eating in men, as compared to women [36], analyses controlled for potential gender differences within our mixed-gender sample. Prior to analyses, data were screened to ensure adherence to homogeneity and normality assumptions; no variables warranted transformation. Missing data were considered missing at random. List-wise deletions were applied, leading to minor fluctuations in sample size across analyses.

Pearson-product bivariate correlations were conducted to evaluate associations between dietary restraint, mindful eating, and intuitive eating. Due to the number of comparisons ($N = 45$), a modified Bonferroni correction was applied; the traditional threshold for significance ($p < .05$) was divided by the number of comparisons. Therefore, statistical significance for correlations was set at $p < .001$. Using this correction, correlations greater than $r = .32$ reached statistical significance. Next, to examine correlations between intuitive eating, mindful eating, and dietary restraint total scores with BMI, eating disorder symptom composite scores, and pasta consumption, hierarchical multiple regression analyses were conducted for each outcome variable. All covariates and predictor variables were centered prior to analysis. Variables were entered in two separate steps: covariates were entered in Step 1 of each model, and hypothesized predictor variables were entered in Step 2. In models showing significant change from Step 1 to Step 2, unstandardized beta weights were

evaluated to determine whether individual predictor variables significantly contributed to variance in outcome variable scores. For models evaluating BMI and EDDS scores, gender was entered as a covariate. For the model evaluating pasta consumption, gender and baseline hunger ratings were entered as covariates. Racial/ethnic status was also considered as a covariate; however, as it was not significant in initial tests, it was excluded for reasons of parsimony.

A two-tailed alpha level of .05 was applied to all a priori statistical tests. Effect size, or strength of relation, was reported as the unstandardized regression slope coefficient or unstandardized beta weight (b), which indicates that a one-unit difference in the exposure variable predicts a b value difference in the outcome variable. For example, if $b = .45$ for the TFEQ-R exposure variable in the overall model for BMI, this indicates that a one-unit increase in TFEQ-R scores predicts a .45 increase in BMI units. Standardized beta-weight values (β) are also presented for reference in Table 2, and can be interpreted as indicating that a one-unit difference in the exposure variable predicts a change in standard deviation (SD) for the outcome variable (i.e., if $\beta = .3$, then a one-unit difference in the exposure variable predicts a change equivalent to .3 standard deviations of the outcome variable). Following recommendations for reporting effect sizes [37], we will use the unstandardized beta weights to interpret and discuss effect sizes and results for BMI and pasta consumption (ounces), because they are generally straightforward units of measurement. Standardized beta weights will be discussed for the EDDS score model, to aid in interpretation.

Results

Are intuitive eating, mindful eating, and restraint scores associated with one another?

In contrast with hypotheses, correlations demonstrated that intuitive eating and mindful eating were differentially related to restraint, as a significant negative correlation emerged between restraint and intuitive eating, $r = -.61$, $p < .001$. Mindful eating was not significantly associated with either intuitive eating or restraint overall scores (see Table 1).

Are intuitive eating, mindful eating, and restraint total scores associated with BMI?

The overall hierarchical regression model for BMI was significant, Adjusted $R^2 = .22$, $\Delta R^2 = .23$, $F(3, 131) = 12.34$, $p < .001$, intuitive eating, mindful eating, and restraint accounted for approximately 23 % of total variance in BMI. Examining unstandardized beta weights, only restraint scores accounted for significant variance in BMI, such that a one-unit increase in TFEQ-R scores yielded a .36 increase in BMI (see Table 2). Gender emerged as a significant covariate, with men reporting higher BMI values ($M_{\text{men}} = 23.8 \pm 3.5$ kg/m^2) than women ($M_{\text{women}} = 22.8 \pm 4.5$ kg/m^2).

Are intuitive eating, mindful eating, and dietary restraint total scores associated with EDDS scores?

Controlling for gender, hierarchical multiple regression analyses indicated that intuitive eating, mindful eating, and restraint total scores accounted for approximately 45 % of the total variance in EDDS scores, adjusted $R^2 = .53$, $\Delta R^2 = .45$, $F(4, 74) = 21.77$, $p < .001$. Of the individual predictors, intuitive eating and restraint scores accounted for significant variance within EDDS scores, such that lower intuitive eating and higher restraint scores were associated with higher EDDS scores (see Table 2). Specifically, a one-unit increase in IES scores was associated with a .36 SD decrease for EDDS scores. Conversely, a one-unit increase in TFEQ-R scores was associated with a .41 SD increase for EDDS scores.

Are specific intuitive eating subscales associated with EDDS scores?

Because the IES scores accounted for a significant amount of variance in EDDS scores, exploratory Pearson-product bivariate correlations examined correlations between specific IES subscales and EDDS scores, as prior research suggested that specific subscales differentially relate to disordered eating [14]. All IES subscale scores were significantly correlated with lower EDDS scores (see Table 1).

Hierarchical multiple regression results suggested that the inclusion of IES subscales accounted for approximately 36 % of the variance within the overall model for disordered eating, adjusted $R^2 = .44$, $\Delta R^2 = .36$, $F(4, 84) = 17.55$, $p < .001$. Two subscales were significant in the final model: the Unconditional Permission to Eat Subscale, $b = -7.69$, SE(b) = 1.4, $\beta = -.50$, $t(184) = -5.65$, $p < .001$, 95 % CI (−10.40, −4.98), and the Eating for Physical Reasons Subscale, $b = -3.03$, SE(b) = 1.34, $\beta = -.21$, $t(84) = -2.26$, $p = .03$, 95 % CI (−5.70, −.36). The third subscale, Reliance on Internal Hunger/Satiety Cues, did not account for statistically significant variance in EDDS scores. Notably, results suggest that a one-unit decrease in Unconditional Permission to Eat, and Eating for Physical Reasons Subscales accounted for a .50 SD and .21 SD increase for EDDS scores, respectively.

Table 1 Pearson-product bivariate correlations for variables of interest

Variable	1	2	3	4	5	6	7	8	9	*Mean*	*SD*
1 IES total	-	.83*	.64*	.63*	−.26	−.61*	−.66*	−.25	.27	69.72	11.66
2 Unconditional permission to eat		-	*.20*	*.32*	*.03*	*−.75**	*−.61**	*−.29*	*.22*	*3.13*	*.81*
3 Eating for physical reasons			-	*.29*	*−.46**	*−.13*	*−.38**	*−.05*	*.12*	*3.15*	*.87*
4 Reliance on internal hunger cues				-	*−.29*	*−.22*	*−.38**	*−.14*	*.24*	*3.78*	*.60*
5 MEQ total					-	−.08	.14	.01	.15	2.80	.30
6 TFEQ-R						-	.57*	.44*	−.13	9.03	5.71
7 EDDS symptom composite							-	.40*	−.29	2.30	1.27
8 BMI (kg/m^2)								-	.14	22.97	4.01
9 Pasta eaten (ounces)									-	7.51	5.34

Italicized values indicate subscale of the IES

IES Intuitive Eating Scale, *MEQ* Mindful Eating Questionnaire, *TFEQ-R* Three-Factor Eating Questionnaire–Restraint Subscale, *EDDS* Eating Disorder Diagnostic Scale, *Pasta eaten* mean amount of pasta consumed by participants during in-laboratory, taste-test meal)

*Modified statistical significance ($r \geq .32$; $p < .001$)

Are intuitive eating, mindful eating, and dietary restraint associated with pasta consumption?

Controlling for gender, hierarchical multiple regression analyses suggested that intuitive eating, mindful eating, and dietary restraint total scores accounted for 8 % of the total variance in the amount of pasta consumed during the in-laboratory taste-test meal (see Table 2 for full model). Pre-meal hunger ratings were significant covariates, with greater initial hunger associated with greater pasta consumption (Tables 1, 2). Of the three predictor variables, only intuitive eating accounted for a significant amount of unique variance for the amount of pasta consumed, such that a one-unit increase in intuitive eating scores was associated with a 4.13-oz increase in pasta consumption, $b = 4.13$, SE (b) = 1.64, $\beta = .34$, $t(84) = 2.52$, $p < .02$, 95 % CI (.87, 7.39). Mindful eating and restraint did not account for unique variance in pasta consumption (Table 2).

Discussion

The first aim of the current study sought to examine associations between mindful eating, intuitive eating, and dietary restraint. Results indicated that intuitive eating significantly negatively correlated with restraint. The observed negative correlations lend support to assertions that intuitive eating may characterize one end of a spectrum that represents attention to internal/external cues with regard to cognitive restriction and reflects the opposite of restraint. In contrast to the hypotheses, mindful eating was not significantly correlated with intuitive eating or restraint. The lack of correlation between mindful eating and intuitive eating, despite theoretical overlap, might be explained by non-shared elements across the two approaches. For instance, an individual may report high levels of intuitive eating-related components, such as unconditional permission to eat when hungry, without also endorsing facets of mindful eating. Considering the basic tenets of each eating approach, it seems that the meditation and mindfulness practices emphasized as the main components of mindful eating are only a portion of the intuitive eating approach. Therefore, unique elements of the intuitive eating approach, such as the degree to which an individual endorses the unconditional permission to eat when hungry, may drive the association with restraint within our sample.

The second aim of the study sought to examine whether intuitive eating, mindful eating, and restraint accounted for unique variance in disordered eating scores, BMI, and in-laboratory eating behaviors. Both restraint and intuitive eating accounted for significant variance within the hierarchical multiple regression model evaluating EDDS scores, such that higher restraint and lower intuitive eating related to elevated risk for disordered eating. Follow-up analyses indicated that the Unconditional Permission to Eat and Eating for Physical Reasons Subscales explained a significant amount of variance in the negative association between intuitive eating and disordered eating. Consistent with previous research [38], the Unconditional Permission to Eat Subscale showed a strong, negative correlation with disordered eating after accounting for other subscales. Increased levels of the unconditional permission to eat reported by intuitive eaters may reduce feelings of deprivation and, thus, lower risk for episodes of disinhibited eating. Eating for physical rather than emotional reasons may also reduce risk for problematic behavioral learning in which food is paired with momentary emotional comfort [39].

Table 2 Hierarchical multiple regression results

Outcome variable	Predictor	R	Adjusted R^2	ΔR^2	b	SE (b)	β	t	95 % CI
BMI									
Step 1		.16	.02	.03					
	Gender				.64	.41	.16	1.54	−.18, 1.46
Step 2		**.50**	**.22**	**.23**					
	Gender				**.95**	**.38**	**.24**	**2.49**	**.19, 1.71**
	IES total				.01	.04	.03	.26	−.07, .10
	MEQ total				−1.33	1.82	−.15	−1.62	−2.47, 4.61
	TFEQ-R total				**.36**	**.09**	**.51**	**4.11**	**.19, .44**
EDDS scores									
Step 1		**.32**	**.09**	**.10**					
	Gender				**−3.83**	**1.32**	**−.32**	**−2.90**	**−6.45, −1.20**
Step 2		**.75**	**.53**	**.45**					
	Gender				−1.52	1.00	−.13	−1.52	−3.51, .48
	IES total				**−.35**	**.11**	**−.36**	**−3.18**	**−.57, −.13**
	MEQ total				5.03	4.61	.10	1.09	−4.16, 14.23
	TFEQ-R total				**.90**	**.24**	**.41**	**3.78**	**.43, 1.37**
Pasta consumption									
Step 1		**.37**	**.12**	**.14**					
	Gender				**36.82**	**14.44**	**.27**	**2.55**	**8.13, 65.50**
	Premeal hunger				**24.81**	**8.98**	**.27**	**2.76**	**6.98, 42.63**
Step 2		**.47**	**.17**	**.08**					
	Gender				25.87	14.54	.17	1.78	−3.03, 54.76
	Premeal hunger				**22.00**	**8.95**	**.24**	**2.46**	**4.21, 39.78**
	IES total				**4.13**	**1.64**	**.34**	**2.52**	**.87, 7.39**
	MEQ total				128.58	69.30	.20	1.86	−9.14, 266.30
	TFEQ-R total				2.47	3.36	.10	.74	−4.21, 9.16

Items in bold indicates statistical significance ($p < .05$). The unstandardized regression slope coefficient (b) indicates that a one-unit difference in the exposure variable predicts the b value SD difference in the outcome variable (i.e., $b = .51$ for TFEQ-R in the overall model for BMI, indicating that a one-unit increase in TFEQ-R score predicts a .51 increase in BMI)

IES Intuitive Eating Scale, *MEQ* Mindful Eating Questionnaire, *TFEQ-R* Three-Factor Eating Questionnaire-Restraint Subscale, *EDDS* Eating Disorder Diagnostic Scale, *pasta consumption* means the amount of pasta eaten during in-laboratory taste-test meal

In partial support for a priori hypotheses, the hierarchical multiple regression model for BMI indicated that restraint accounted for significant variance in BMI, whereas intuitive eating and mindful eating did not. The lack of correlation between intuitive eating and BMI contrasts with previous reports within college samples [27, 40]. In contrast, the link between restraint and BMI coincides with restraint theories and previous research supporting the hypothesis that elevated restraint may pose risk for eating-disordered behaviors and subsequent weight gain.

The last aim of the study sought to evaluate the correlations between each construct and in-laboratory eating behavior. Findings for in-laboratory meal consumption suggest that, controlling for hunger ratings, intuitive eating scores demonstrated a significant positive relation with the amount of pasta eaten following a 4-h fast. This association may suggest that individuals high in intuitive eating who experienced hunger cues appropriately attended and responded to these physiological sensations in the in-laboratory meal. Notably, restraint and mindful eating were not associated with in-laboratory eating, suggesting that self-reported levels of restraint and mindful eating practices were not indicative of overall laboratory meal intake. Because pasta intake in the test meal was consistent across levels of restraint, it may be the case that self-reported restraint is limited in its ability to account for patterns of food consumption. Overall, the level of intuitive eating may better predict appropriate caloric consumption when responding to hunger/satiety cues.

Limitations

Results from the current study should be interpreted in light of several limitations. For example, it is possible that there

are differences between individuals who are naïve to official mindful or intuitive eating practices and individuals who may be trained in mindfulness exercises, or who explicitly follow Tribole and Resch's intuitive eating approach [38] that is not captured in the MEQ or IES questionnaires. For example, an individual may believe and self-report that he or she naturally has a high reliance on internal hunger cues; however, if this individual were to learn and practice Tribole and Resch's intuitive eating protocol [23], he or she may instead be truly more aware of his or her reliance on internal hunger cues and therefore provide a more accurate rating of the constructs of interest. Another limitation lies in the fact that this study employed the original IES [31]. Another version of the scale has been published that contains a new subscale, Body–Food Choice [41], which measures whether individuals select nutritious foods to help fulfill physical and functional need; this additional subscale may explain unique variance in models for weight and eating-related constructs (i.e., BMI, disordered eating) not accounted for in the current study. Additionally, findings in meal consumption may have been influenced by taste preferences (taste ratings of the pasta and sauce); accordingly, results cannot be generalized across different types of food. Finally, this study was cross-sectional and may not accurately reflect longitudinal eating patterns or generalize across various groups, as the sample comprised mostly white, female college students. Therefore, it cannot be directly determined whether the study constructs relate in a similar way across other samples, such as males, individuals with different racial and ethnic backgrounds, or individuals with varying levels of eating disorder symptoms (i.e., clinical samples).

Clinical implications

Even in a non-treatment-seeking population, correlations indicated negative correlations between intuitive eating and disordered eating scores; therefore, incorporating intuitive eating components into eating disorder treatment and prevention may encourage healthy eating behaviors, while mitigating risk for obesity. Some constructs central to intuitive eating, such as unconditional permission to eat when hungry, are counter to traditional dietary advice provided for weight management efforts within our current health paradigm; however, incorporating an approach that emphasizes eating when hungry may strengthen existing prevention and intervention efforts for weight management efforts.

Conclusions

This investigation indicates that intuitive eating, mindfulness, and restraint are not strongly related in a non-clinical population. Furthermore, intuitive eating, but not mindful eating, appears to demonstrate a negative correlation with individuals against eating disorder symptoms. Future research should seek to replicate findings using different study designs and across various populations, with consideration for individual differences such as gender or ethnicity that may impact the associations between constructs.

Compliance with ethical standards

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in the study.

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