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Eating Disorder Symptoms and Weight and Shape Concerns in a Large Web-Based Convenience Sample of Women Ages 50 and Above: Results of the Gender and Body Image Study (GABI)

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Abstract

Objective—Limited research exists on eating disorder symptoms and attitudes and weight and shape concerns in women in mid-life to older adulthood. We conducted an online survey to characterize these behaviors and concerns in women ages 50 and above.

Method—Participants ($n = 1,849$) were recruited via the Internet and convenience sampling.

Results—Eating disorder symptoms, dieting and body checking behaviors, and weight and shape concerns were widely endorsed. Younger age and higher body mass index (BMI) were associated with greater endorsement of eating disorder symptoms, behaviors, and concerns.

Discussion—Weight and shape concerns and disordered eating behaviors occur in women over 50 and vary by age and BMI. Focused research on disordered eating patterns in this age group is necessary to develop age-appropriate interventions and to meet the developmental needs of an important, growing, and underserved population.

Keywords

eating disorder symptoms; binge eating; body dissatisfaction; mid-life; older adult; women

Over 53 million women in the United States are over age 50, comprising approximately 17.2% of the total population.¹ Despite their growing influence in our society, little is known about disordered eating behaviors and attitudes of women in this age range. By assessing current and past disordered eating behaviors in women over 50, the current study aimed to gain a greater understanding of the nature and magnitude of weight and shape concerns of women in this age group to assist with service planning, if required.

Population-based studies in the United States and Europe have reported reduced risk for eating disorders as women mature.^{2, 3} In a study of European women, Preti and colleagues³ reported lower lifetime risk of anorexia nervosa (AN; 0.17% vs. 0.58%), bulimia nervosa (BN; 0.21% vs. 0.55%), and binge eating disorder (BED; 0.61% vs. 1.07%) in women ages 45 years and over compared with women between 30 and 44 years of age. Similarly, in the

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Disclosures

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United States, women ages 18 to 59 were significantly more likely than women ages 60 and over to suffer from BN and BED, but not AN.² In both the European and the American samples, age was inversely related to lifetime risk for eating disorders.^{2,3} However, inconsistencies in the age stratification of samples (e.g., stratification by decade, combining all women over 45 in a comparison group) may have obscured differences in the risk of eating disorders within these age groups. Prevalence estimates of eating disorders in women over 50 are lacking, resulting in an incomplete picture of eating disorders in this age group.

In contrast to population-based statistics, clinical investigations report the presence of late-onset eating disorders^{4,5} and reveal increasing inpatient admissions for eating disorder treatment in women ages 35 and over.⁶ Emerging epidemiologic and clinical reports of women during mid-life suggest that eating disorders present in one of three ways—either a chronic presentation of an earlier-onset disorder without a period of recovery; a relapse of a remitted disorder that occurred earlier in life; or, a late-onset presentation with no past history.^{5,7-11} The prevalence of late-onset eating disorders in clinical samples of women with eating disorders at midlife (over age 40) appears to be quite modest.^{5,11,12} However, a recent review of forty-eight case studies of eating disorders in individuals over the age of fifty reported that 69% (i.e., thirty-three studies) had late onset eating disorders.¹² A fuller understanding of these contrasting patterns of presentation necessitates further study.

Limited research has followed women with histories of eating disorders as they age. In a 20-year longitudinal study of men and women from late adolescence (age 20 ± 2 years) to mid-life (40 ± 2 years), Keel et al.¹³ reported that 75% of women who met criteria for BN and eating disorders not otherwise specified (EDNOS) in late adolescence were in remission at mid-life. Yet, the estimated point prevalence of BN and EDNOS in mid-life women was 4.5%.¹³ As a critical starting point, the expansion of this line of research will increase our knowledge of the trajectory or trajectories of eating disorders in mid-life and beyond.

Several community studies have explored disordered eating behaviors among women during mid-life.¹⁴⁻¹⁶ Of 475 Austrian women ages 60 to 70 years, 3.8% met diagnostic criteria for an eating disorder (e.g., AN, BN or EDNOS) and 4.4% endorsed a current single symptom of an eating disorder (e.g., binge eating, laxative/diuretic use, or vomiting).¹⁴ A multiethnic sample of slightly younger women ages 42 to 55 years revealed that 11% of women endorsed binge eating at least two to three times a month.¹⁵ Dieting behaviors and weight and shape concerns, such as fear of weight gain and preoccupation with food, were also reported in community samples of women during mid-life and late adulthood,^{14,15,17-19} even in women reporting a body mass index (BMI) in the healthy range.^{17,20} Mid-life women report greater disordered eating behaviors and concerns, including drive for thinness and disinhibited eating, compared with older women in the same samples suggesting either a decrease in disordered eating behaviors and concerns between mid-life and older adulthood or a cohort effect, given that these were not longitudinal investigations.^{18,20,21}

Body dissatisfaction is also a pertinent concern among mid-life women. Collectively, studies indicate that overall body dissatisfaction is somewhat stable across the lifespan,^{22,23} with mid-life and older adult women reporting body dissatisfaction similar to that of younger women.^{21,24-26} In addition, greater body dissatisfaction is associated with higher BMI in mid-life women.^{14,18,20,21,27,28} BMI increases through middle age, levels off, and then begins to decrease around age 60 years.²⁹ During this transition from mid-life to older adulthood, other physiological changes occur as well (e.g., skin changes, fat redistribution). A major limitation of the current literature on body dissatisfaction among mid-life women is the reliance on figure-rating scales and questionnaires that fail to assess dissatisfaction with features of the body associated with the aging process (e.g., skin, face, and abdomen). One small study³⁰ of 55 women found the prevalence of dissatisfaction for ten different body

parts was similar across age (young, middle, old), with the stomach, hips, and thighs rated most negatively. However, this study did not assess dissatisfaction with skin, a key feature of the body influenced by aging, and may have lacked adequate power to detect differences; thus larger studies are needed to replicate and extend these findings.

To increase knowledge of disordered eating behaviors and associated attitudes in this demographic group, the present study surveyed a large sample of adult women ages 50 and over. The aims of the study were to: 1) estimate the prevalence of current and past core eating disorder symptoms, weight control and body checking behaviors, and weight and shape concerns in a large sample of women ages 50 and above; 2) document differences on these dimensions across age and BMI categories; and 3) compare responses across three groups: women who endorse current core eating disorder symptoms (currentEDS), women who endorse a history of core eating disorder symptoms but no current symptoms (pastEDS), and women who report no history of core eating disorder symptoms (noEDS). The third aim was directed toward understanding whether eating disorder symptoms in the past were associated with persistent disordered eating behaviors and attitudes in later adulthood.

METHODS

Participants and Procedure

The study sample comprised 1,849 females, ages 50 and over, with computer access who consented to participate in an online survey entitled, “Body Image in Women 50 and Over—Tell Us What You Think and Feel.” The survey consisted of multiple choice, fill-in, and open-ended questions on body image, aging, eating, and weight loss attitudes and behaviors. The survey included questions, described in detail below, taken from a previously fielded questionnaire^{31, 32} and was modeled after a prior study investigating disordered eating behaviors in women ages 25 to 40.³³ The survey was uploaded and collected from September 22, 2010 to January 25, 2011 using an electronic survey tool, SurveyMonkey (www.surveymonkey.com). Participants were recruited via a combination of online methods, including: University of North Carolina at Chapel Hill's student and employee listservs; LinkedIn (www.linkedin.com), a professional networking site; ResearchMatch (www.researchmatch.org), a national research study recruitment registry; Craigslist (www.craigslist.com); and emails to leaders of senior and recreation centers and women's health and aging non-profit agencies and blogs. In addition, we used convenience sampling by recommending that survey respondents forward the survey link to others. The surveys were anonymous and the researchers never collected the names of or directly contacted participants of the survey.

An invitation email was sent with a brief description of the study and the online survey URL, which directed to the online consent form. The online consent form contained a detailed explanation of the study and the names and contact information of affiliated UNC research study personnel. In total, 2,020 women consented to participate in the study. One hundred and sixty-seven women were excluded for a reported age younger than 50 and four were excluded for responding with an implausible year of birth, yielding a final sample of 1,849 women. Participation in this study was voluntary and no compensation was given. Participants were prohibited from completing the survey more than once via a feature of SurveyMonkey, in which the URL can set a limit of allowing only one response per computer by placing a cookie on the individual's browser. The researchers were not able to access any identifying information provided by the participants. This study was approved by the Public Health-Nursing Institutional Review Board of the University of North Carolina at Chapel Hill.

Measures

Demographic Characteristics—All women were asked to report their racial and ethnic identity. Race included: 1) White, 2) Black or African American, 3) Asian, 4) American Indian or Alaska Native, 5) Native Hawaiian or other Pacific Islander, 6) Other, and 7) Multiracial. Hispanic/Latina ethnicity was defined as Spanish, Hispanic, or Latina group membership and all participants were coded as either Hispanic or non-Hispanic. Distinctions between race and ethnicity are complex;³⁴ therefore, we chose to follow current race and ethnicity classifications by the National Institutes of Health.³⁵ Other demographic variables obtained by self-report were age, height, and weight. BMI (kg/m^2) was calculated using self-reported height and weight.

Core Eating Disorder Symptoms—Questions relevant to the core eating disorder symptoms were taken directly from previously published studies with the Virginia Twin Registry.^{31, 32, 36} Questions were modeled after the Structured Clinical Interview for the Diagnostic and Statistics Manual of Mental Disorders, Fourth Edition (DSM-IV)³⁷ to assess current and past symptoms. Core eating disorder symptoms were assessed rather than categorical eating disorder diagnoses to obtain a more nuanced and dimensionalized profile of the sample. Algorithms captured five core eating disorder symptom profiles: 1) low BMI (kg/m^2) (BMI < 18.5 was chosen in accordance with Centers for Disease Control and Prevention (CDC) guidelines, http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html, for underweight); 2) binge eating and purging (minimum binge frequency of once per week and purging frequency of at least once in the last five years); 3) binge eating only (minimum binge frequency of once per week and no history of purging in the last five years); 4) purging in the absence of binge eating (a summary behavioral index of endorsing any type of purging behavior, including vomiting, laxative use, diuretic use, diet pill use or excessive exercise in the last 5 years as a method to control weight, while excluding those with a low BMI or current binge eating); and 5) no eating disorder symptoms (noEDS), which includes those who did not report any of the four symptom profiles. “Current” and “past” eating disorder symptoms were determined via age of last reported behavior relative to self-reported age at survey completion except for purging behaviors. Because our survey only inquired about purging behaviors in the last five years without age of last purging behavior documented, we were unable to differentiate between “past” and “current” purging. Due to the salience of this behavior, purging in the last five years was included in definitions for both “current” and “past” eating disorder symptoms (described below). Participants were classified as “current low BMI” if they had both a 1) BMI < 18.5 and 2) lowest adult weight that occurred at their current age. “Current binge eating” was defined as binge eating at least once per week that occurred at the participant's self-reported age at survey completion.

These five eating disorder symptom profile groups were then combined into three mutually exclusive groups representing a combination of temporal status with reported core eating disorder symptoms: 1) women who endorse any core current eating disorder symptoms (currentEDS), 2) women who endorse a history of any core eating disorder symptoms but no current core symptoms (pastEDS), and 3) women who report no history of any core eating disorder symptoms (noEDS). If participants reported current low BMI, current binge eating and purging, or current binge eating, they were classified as “current eating disorder symptoms (currentEDS).” Of the remaining respondents, those who report a history of low BMI, a history of binge eating and purging, or a history of binge eating and no current symptoms were classified as “past eating disorder symptoms (pastEDS).” Given our inability to distinguish between “current” and “past” purging (i.e., purging that occurred at the time of survey completion versus in the last five years), it is important to note that the “pastEDS” group may include a subset of women with purging behavior within the past five years. Lastly, of the remaining group not classified in either the current or past disordered

eating groups, respondents who did not report a low BMI and binge or purge behaviors were classified as “no eating disorder symptoms (noEDS).” These three symptom groups were used in subsequent statistical tests.

Weight Control and Checking Behaviors—Current weight loss attempts and time spent dieting in the past five years were each measured as dichotomous variables. Current weight loss status was categorized as either “Currently trying to lose weight” or “Not trying to lose weight.” The variable measuring time spent dieting in the past five years was categorized as either “About half of the time or more” or “About less than half of the time.” The frequency of body size or shape checking behaviors (e.g., looking in mirrors, pinching stomach, checking if thighs rub together) was categorized as 1) “Practically hourly or more,” “Several times a day,” or “Daily,” 2) “A few times a week,” “A few times a month,” or “Never.” The frequency of weighing oneself was categorized as 1) “Two or more times a day,” “Daily,” or “A couple times a week,” 2) “About once a week,” “About once a month,” “A couple times a year,” or “Never.” The endorsement of specific disordered eating behaviors in the past five years to control weight included: vomiting, laxatives, diuretics, diet pills, and excessive exercise.

Weight and Shape Concerns—Survey questions about attitudes towards current weight and shape were based on previous published questionnaires.^{31-33, 36} To assess weight and shape concerns, participants were asked the extent to which concerns about eating, weight, or shape negatively affected their lives and the importance of weight or body shape on their self-perception (i.e., how they feel about themselves). Weight concerns were also assessed by asking respondents the frequency of thoughts about their weight and of negative feelings associated with gaining five pounds. Overall satisfaction levels with body parts or appearance in comparison to when younger were assessed for the following: stomach (abdomen), shape, skin (elasticity, pigmentation), weight (number on the scale), arms, face (facial features, complexion), thighs, and overall appearance. Detailed descriptions of the survey questions are presented in Table 1.

Statistical Analysis

Descriptive statistics include mean and standard deviation (*SD*) for continuous and count variables and percent frequencies for categorical variables. We used Fisher's exact tests on two-by-two frequency tables to test the association between all possible pair-wise combinations of eating disorder symptom groups (currentEDS, pastEDS, noEDS) and dichotomous variables for attitudes and behaviors. A *t*-test was used to test differences in mean BMI and age across the same 21 dichotomous variables representing attitudes and behaviors.

For both the *t*-tests and Fisher's exact tests, *p*-values were adjusted using the permutation method.³⁸ This method is appropriate when there are correlated data with no means to control or adjust for non-independence as assumed exists in this type of convenience sample.³⁹ This method also requires exchangeability – a condition in which the different permutations of the data are equally likely under the null hypothesis⁴⁰—and we will assume it holds although the data are observational and comparison groups were not randomly assigned. If the exchangeability assumption is violated smaller *p*-values can still hold value indicating areas for further exploration.⁴¹ Using the permutation method, a sample of *p*-values is generated by repeatedly randomly shuffling the outcomes across the comparison groups and conducting the designated statistical test with corresponding *p*-value. This adjustment process is also considered as generating a distribution of *p*-values based on sampling without replacement. The adjusted *p*-value corresponds to the probability of exceeding the observed *p*-value using the generated distribution. For these adjustments we

used 10,000 replicates per adjusted p -value. Also, because the p -values are based on a sampling from the data set, inferences cannot be extrapolated to any sort of population outside of the one observed.

Following the p -value adjustment process, Benjamini-Hochberg false discovery rate (FDR) was used in type I error control with the group of t -tests from BMI and age outcomes treated as one family of tests and the group of exact tests as another family of tests. All analyses were performed using SAS/STAT software, Version 9.2 of the SAS System for Windows.⁴² An alpha level of $p < 0.05$ indicates statistical significance.

RESULTS

Demographics

Demographics of the 1,849 included women are presented in Table 2. The mean age was 59.1 years ($SD = 6.8$) and the mean BMI was 27.4 kg/m² ($SD = 6.5$). Using the CDC guidelines, 1.6% were underweight (< 18.5 kg/m²), 42.2% normal weight ($18.5 \text{ BMI} < 25.0$ kg/m²), 29.3% overweight ($25.0 \text{ BMI} < 30.0$ kg/m²), and 26.9% obese (> 30.0 kg/m²). The sample was 92.1% White, 4.6% Black or African American, 1.2% Other, 1.1% Multiracial, 0.8% Asian, and 3.1% Hispanic/Latina.

Prevalence of Core Eating Disorder Symptoms

The prevalence of core eating disorder symptoms is presented in Table 3. Overall, the most prevalent current symptom was binge eating (minimum binge frequency of once per week), which was endorsed by 3.5% of the total sample. Current low BMI (0.1%) and current binge eating and purging (binge frequency of once per week and endorsement of any purging within the past five years) (0.2%) were rare. Within the past five years, 7.8% of women endorsed purging in the absence of binge eating. Past core symptoms were more common with more women reporting a history of low BMI (19.5%), a history of binge eating (with no purging in the last five years) (4.6%), and a history of binge eating and purging (1.4%).

Weight Control and Checking Behaviors

Of the sample, 71.2% of women were currently trying to lose weight with 35.6% spending half of the time or more in the past five years dieting. For specific behaviors, 41.2% of women reported checking body size or shape daily or more and 40% reported weighing themselves a couple times per week or more. In the past five years, women endorsed the following extreme weight control behaviors: vomiting (1.2%), laxatives (2.2%), diuretics (2.5%), diet pills (7.5%) and excessive exercise (6.8%). Weight and shape-related behaviors for the entire sample are presented in Table 4.

Weight and Shape Concerns

Weight and shape concerns in the sample are presented in Table 5. Respondents reported that concerns with eating, weight or shape “occasionally” to “often” negatively affected their lives (61.8%) and that weight or body shape have a “moderate” to “the most important” role in their self-perception (79.1%). Weight concerns were also predominant in the sample with 63.9% of women reporting thoughts about their weight daily or more and 63.7% feeling “moderately” to “extremely” upset if they gained five pounds. Relative to their satisfaction at a younger age, women frequently endorsed being “less satisfied” or “much less satisfied” with the following: stomach (83.9%), shape (73.3%), skin (70.1%), weight (71.1%), arms (65.8%), face (54.1%), thighs (57.4%), and overall appearance (66.4%).

Associations between Age and BMI and Current Weight Control and Weight and Shape Concerns

The associations between age and current weight control and weight- and shape-related concerns are presented in Table 6 (left side). The following variables had significant inverse associations with mean age: currently trying to lose weight ($p < .02$), dieting half the time or more ($p < .004$), checking body size or shape daily or more ($p < .001$), vomiting ($p < .05$), and use of laxatives ($p < .03$), diet pills ($p < .001$), and excessive exercise ($p < .02$). In contrast, frequent weighing (weighing oneself a couple of times a week or more) ($p < .03$) was positively associated with mean age. Five items from weight and shape concerns or body part satisfaction items were inversely associated with mean age: reports that eating, weight, or shape had a negative effect on life ($p < .001$); greater importance of weight or body shape on self-perception ($p < .001$); higher frequency of thoughts about weight ($p < .001$); and dissatisfaction with weight ($p < .05$) and thighs ($p < .001$).

The associations between current weight control and weight and shape concerns and BMI are presented in Table 6 (right side). Participants reporting currently trying to lose weight ($p < .001$), dieting half the time or more ($p < .001$), and using diuretics ($p < .001$) and diet pills ($p < .001$) had significantly higher BMI. In contrast, women reporting frequent weighing (weighing oneself a couple of times a week or more) ($p < .002$) had lower mean BMI. Women reporting the following weight and shape concerns had a higher mean BMI: eating, weight, or shape affecting life negatively ($p < .001$), higher frequency of thoughts about weight ($p < .001$), and feeling upset by a five-pound weight gain ($p < .002$). Lastly, women reporting dissatisfaction with appearance compared with youth for the following items had higher mean BMI: stomach, ($p < .001$), shape ($p < .001$), weight ($p < .001$), arms ($p < .001$), thighs ($p < .001$), and overall appearance ($p < .001$). In contrast, the group reporting greater dissatisfaction with skin ($p < .001$) had a lower mean BMI.

Comparison of CurrentEDS, PastEDS, and NoEDS Groups

According to our definitions, the majority of women reported no history of core eating disorder symptoms (59.0%), but a meaningful percentage of women endorsed current (13.3%) or past (27.7%) core eating disorder symptoms.

As would be expected, compared with the noEDS and the pastEDS groups, the currentEDS group reported significantly more weight loss attempts ($p < .03$ and $p < .001$), time spent dieting ($p < .001$ and $p < .001$), and use of laxatives ($p < .001$ and $p < .01$), diuretics ($p < .001$ and $p < .001$), diet pills ($p < .001$ and $p < .001$), and excessive exercise ($p < .001$ and $p < .001$) in the last 5 years, and greater body checking ($p < .001$) and vomiting ($p < .001$) behaviors when compared to the noEDS group only. Furthermore, relative to the other two groups, a significantly greater portion of women in the currentEDS group reported eating, weight, or shape negatively affected their lives ($p < .001$ and $p < .001$), more frequent thoughts about weight ($p < .001$ and $p < .004$), and greater importance of weight or shape on self-perception ($p < .006$) and feeling upset with a five-pound weight gain ($p < .003$) in comparison to the noEDS group. The currentEDS group also had greater dissatisfaction with their thighs ($p < .001$ and $p < .006$) relative to both the noEDS and pastEDS groups, and greater dissatisfaction with their weight ($p < .001$) and less dissatisfaction with skin ($p < .02$) compared with the pastEDS group only.

Finally, differences did emerge between the pastEDS group and the noEDS group. The pastEDS group was more likely to report use of vomiting ($p < .02$), laxatives ($p < .005$), diet pills ($p < .001$), excessive exercise ($p < .001$) for weight control in the last five years, and dissatisfaction with skin ($p < .001$) and face ($p < .04$) compared with the noEDS group.

DISCUSSION

Results of our detailed survey on core eating disorder symptoms, weight control behaviors, and weight and shape concerns in women over age 50 years suggest that disordered eating occurs well into mid-life and older adulthood. About 13% of our sample endorsed some form of core current eating disorder symptom. The most commonly endorsed symptoms were current binge eating (3.5%) and purging in the absence of binge eating in the past five years (7.8%). Diet pill use and excessive exercise were the most commonly reported weight control behaviors. Our results mirror other studies that found evidence of disordered eating in samples of women during mid-life to older adulthood.¹⁴⁻¹⁶ Although most women did not endorse current core symptoms (defined in our study as binge eating, purging, or low BMI), dieting behaviors were frequently endorsed with 71.2% currently trying to lose weight and 35.6% spending more than half of the time in the past five years dieting. Weight and shape concerns were also very common: 79.1% of women responded that weight or shape plays a “moderate” to “the most important” role in their self-perception; 61.8% responded that concerns about eating, weight or shape “occasionally” to “often” negatively affected their lives; and over 70% reported dissatisfaction with their current weight and shape compared to when younger, with a high prevalence of dissatisfaction with the stomach (83.9%).

A hierarchy of current weight and shape concerns and current use of maladaptive weight control behaviors emerged as a function of eating disorder symptom history. As expected, current concerns and maladaptive weight control behaviors were most common among women who reported current core eating disorder symptoms and least common (although still present) among women with no history of core eating disorder symptoms. Women with histories of eating disorder symptoms also reported greater current weight and shape concerns and current use of maladaptive weight control behaviors than women with no history of eating disorder symptoms. Overall, negative eating- and body-related attitudes were endorsed in all three groups of women and results suggest a lingering negative impact of eating disorder symptoms on weight and shape concerns, even in women who are no longer symptomatic. This study reveals that weight and shape concerns and maladaptive weight control behaviors exist well into older adulthood. In order to develop a comprehensive understanding of these issues in mid-life and beyond, researchers need to broaden the focus of inquiry rather than simply focusing on women who currently meet diagnostic criteria for an eating disorder.

As our sample spanned a large age range, we were able to explore differences in symptoms, behaviors, and attitudes across the age spectrum. Our cross-sectional design precluded any clear conclusions about whether these differences indicate changes with age or cohort effects; nonetheless, we were able to replicate and extend previous investigations^{18, 21} revealing that younger mean age was associated with more eating disorder symptoms, dieting behaviors, and weight and shape concerns. Several possible explanations exist for the age differences present in our sample. First, discrepancies in symptoms and attitudes between women in mid-life and older adulthood may represent a cohort effect. For example, women in mid-life may have been exposed to a greater degree of sociocultural pressures, such as idealization of thinness, than women in older adulthood.⁴³⁻⁴⁵ Secondly, as women age, physical appearance may become less important while health and body functionality become more salient.^{26, 46, 47} Lastly, for the younger women in the sample (i.e., early fifties), experiences with menopausal symptoms such as changes in hormone levels, increase in body fat, fat redistribution from the legs to the trunk, and decreased metabolism^{48, 49} may increase risk for disordered eating behaviors and concerns.⁵⁰

BMI was also a relevant factor in this study with women endorsing eating disorder symptoms, behaviors, and attitudes having a higher mean BMI than those who did not

endorse eating disorder symptoms. In particular, women reporting overall body dissatisfaction and diet pill/diuretic use had a higher mean BMI than the referent group. Our results confirm findings of several past studies of mid-life to older adulthood women that found higher BMI is associated with more disordered eating symptomology^{15, 18, 28} and increased body dissatisfaction,^{14, 21, 28, 51} dieting behaviors,¹⁸ preoccupation with food,¹⁸ and drive for thinness.²¹ On the contrary, women who reported being dissatisfied with their skin had a lower mean BMI, which concurs with research reporting a negative correlation between BMI and skin wrinkling⁵² and perceived facial age⁵³ in two samples of women ages 70 and over.

The positive association of disordered eating behaviors and symptoms with mean BMI should be viewed in context of the negative health impact of obesity on mid-life women. Numerous studies associate obesity with a variety of comorbidities, many of which have been validated in meta-analyses and population studies, including various cancers,⁵⁴⁻⁵⁷ cardiovascular disease,^{54, 55, 58, 59} osteoarthritis,^{54, 57, 59, 60} and type II diabetes mellitus.^{54, 55, 59, 61} Obesity is also associated with increased cancer- and cardiovascular disease-related mortality.⁶² In this context, some weight and shape concerns and behaviors identified among participants in this study, of whom over 50% were overweight or obese, may not necessarily be maladaptive but rather constitute realistic and appropriate concerns about excess weight. For example, over 70% of women reported currently trying to lose weight, which for some, could be a medically indicated goal. However, regardless of BMI, excessive concern with dieting, weight, and body shape and overall body dissatisfaction can have negative consequences on women's self esteem, self-efficacy, and quality of life, and may increase risk for developing a full-blown DSM-IV eating disorder.^{63, 64} Disordered eating symptomology¹⁸ and body dissatisfaction⁶⁵ are also negatively associated with older women's perceived physical health. Maladaptive weight control behaviors, some of which (e.g., diuretic and diet pill use) were associated with higher BMI in our sample, can also have severe physical consequences, highlighting the salience of these findings.⁶⁶⁻⁶⁹

A key question remains: are overweight and obese women engaging in maladaptive weight control behaviors due to their awareness of the negative impact of excess weight on their health? If the answer is yes, then greater public health attention must be drawn towards effective strategies to achieve health rather than desperate and ultimately ineffective attempts at weight loss (e.g., diuretics, diet pills)—which create more medical problems than they solve. Given that 68.6% of women ages 60 and over in the United States are overweight or obese (BMI ≥ 25 kg/m²) with 33.6% of these women being obese (BMI ≥ 30.0 kg/m²),⁷⁰ it is imperative that future research concentrate on eating disorder symptoms, behaviors, and weight and shape concerns and their potential influence on the health of overweight and obese women in mid-life to older adulthood.

Several limitations should be considered when interpreting our results. Foremost, some factors limit the generalizability of our findings to women over 50 living in the United States; these include: 1) use of a non-probability sampling method, 2) absence of geographic or socioeconomic data due to our efforts to maintain respondent anonymity, 3) under-representation of racial and ethnic minority women despite attempts to increase minority participation, and 4) reliance on the Internet for data collection possibly resulting in selection bias. Although recent census data indicate that over 76 million men and women (ages 45-64) and 41 million (ages 65 and over) use the Internet,⁷¹ we were unable to sample individuals who are not Internet users. As recent census statistics demonstrate a trend of reduced Internet usage by those with a lower household income,⁷¹ a lack of Internet access may be a proxy for low SES, in which case our sample may be skewed to more affluent participants.

In addition to these factors, our study was limited to self-report data which may have led to either under or over reporting on survey responses; we did not provide a definition of excessive exercise to participants, thus we cannot validate their responses; and, we did not inquire about women's menopausal status, which limited our ability to disambiguate age- and menopause-related differences in our outcome variables. We also acknowledge that the time frame being different for the purging behaviors (i.e., last five years) from the time frame of other behaviors (i.e., age of last reported behavior relative to self-reported age at survey completion) is not optimal from a design perspective. Additionally, we were unable to incorporate information about surgeries or medical conditions that may have influenced their current BMI or body appearance into the analyses. The absence of this information limits one facet of our understanding of the current weight control behaviors and weight and shape concerns in this sample. Finally, our question about low BMI did not include adequate follow-up to determine cause of low BMI; therefore, we cannot distinguish low BMI secondary to an eating disorder from other cited causes of low BMI, such as cancer,⁷² depression,^{73, 74} HIV/AIDS,⁷⁵ medication effects,⁷⁶ alcohol abuse,⁷⁷ or decreased food intake associated with aging.^{78, 79}

In conclusion, the presence of eating disorder symptoms, maladaptive weight control behaviors, and weight and shape concerns in our sample provides a glimpse into the current struggles of women ages 50 and above, but more research is needed to focus on the unique experiences of women in this age group. High endorsement of dieting behaviors and body dissatisfaction demonstrates women continue to experience body image and weight loss pressures well into later adulthood. Clinicians should be aware of and screen appropriately for symptoms, behaviors, and concerns that may adversely influence older women's physical and psychological health. Future research focusing on the underlying factors influencing disordered eating and weight and shape concerns of women in this age group is essential for the development of tailored interventions for those women in need of support. The ultimate aim of our research was to bring to light the concerns that women over 50 have for their bodies, appearance, and weight both to give appropriate attention to, and to encourage more research on, an often neglected yet influential segment of our population.

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Table 1

Weight and Shape Concern Questions and Response Options

Weight and Shape Concern Questions	
Negative Response Options	Neutral or Positive Response Options
Impact of eating, weight or shape concerns on life	
<ul style="list-style-type: none"> • Somewhat; I have concerns about eating, weight, or shape and occasionally these concerns negatively affect or interfere with my life. • A lot; I have concerns about eating, weight or shape and these concerns often negatively impact my life. 	<ul style="list-style-type: none"> • Almost never • Not at all; I don't have concerns about eating, weight, or shape.
Importance of weight or body shape on self-perception	
<ul style="list-style-type: none"> • Moderate part • Significant part • The most important thing that affects how I feel about myself 	<ul style="list-style-type: none"> • Small part • Not at all important to how I feel about myself
Frequency of thoughts about weight	
<ul style="list-style-type: none"> • Often (daily) • Very often (several times a day) • Always (it's constantly on my mind) 	<ul style="list-style-type: none"> • Occasionally (a few times a week) • Rarely (a few times a month) • Never
Weight gain concerns on gaining five pounds	
<ul style="list-style-type: none"> • Moderately upset • Extremely upset 	<ul style="list-style-type: none"> • Slightly upset • Not upset at all
Satisfaction of current body/appearance in comparison to youth: Weight (number on a scale); Shape; Stomach (abdomen); Arms; Thighs; Face (facial features, complexion); Skin (elasticity, pigmentation); Overall Appearance	
<ul style="list-style-type: none"> • Less satisfied • Much less satisfied 	<ul style="list-style-type: none"> • Neither more nor less satisfied • More satisfied • Much more satisfied

Table 2

Demographic characteristics of the entire sample.

Category	Age Groups No. (%), unless otherwise noted					Total (N = 1849)
	50-54 (N = 555)	55-64 (N = 947)	65-74 (N = 290)	75-84 (N = 52)	85+ (N = 5)	
<i>Age at year of interview</i>						
Mean (SD)	52.2 (1.3)	59.0 (2.8)	68.4 (2.7)	77.9 (2.9)	86.0 (1.7)	59.1 (6.8)
<i>Race</i>						
White	493 (89.6)	868 (92.6)	271 (94.4)	49 (94.2)	5 (100.0)	1686 (92.1)
Black or African American	28 (5.1)	47 (5.0)	8 (2.8)	1 (1.9)	0 (0.0)	84 (4.6)
Asian	7 (1.3)	7 (0.7)	1 (0.3)	0 (0.0)	0 (0.0)	15 (0.8)
American Indian or Alaska Native	0 (0.0)	1 (0.1)	1 (0.3)	0 (0.0)	0 (0.0)	2 (0.1)
Native Hawaiian or Pacific Islander	0 (0.0)	1 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.1)
Other	10 (1.8)	8 (0.9)	2 (0.7)	2 (3.8)	0 (0.0)	22 (1.2)
Multiracial	12 (2.2)	5 (0.5)	4 (1.4)	0 (0.0)	0 (0.0)	21 (1.1)
<i>Ethnicity</i>						
Hispanic/Latina	20 (3.6)	27 (2.9)	7 (2.5)	3 (5.8)	0 (0.0)	57 (3.1)
Non-Hispanic/Latina	528 (96.4)	905 (97.1)	275 (97.5)	49 (94.2)	5 (100.0)	1762 (96.9)
<i>BMI (kg/m²)</i>						
Underweight	8 (1.5)	16 (1.9)	2 (0.8)	0 (0.0)	0 (0.0)	26 (1.6)
Normal	221 (42.7)	355 (42.0)	95 (39.6)	21 (58.3)	1 (33.3)	693 (42.2)
Overweight	128 (24.8)	247 (29.2)	94 (39.2)	10 (27.8)	2 (66.7)	481 (29.3)
Obese	160 (30.9)	228 (27.0)	49 (20.4)	5 (13.9)	0 (0.0)	442 (26.9)
Mean (SD)	27.8 (7.0)	27.5 (6.6)	26.8 (5.2)	26.0 (6.4)	26.6 (2.6)	27.4 (6.5)

Columns 100% due to missing data.

Table 3

Frequencies of core eating disorder symptoms in entire sample by age

Category	Age Groups No. (%), unless otherwise noted						Total (N = 1849)
	50-54 (N = 555)	55-64 (N = 947)	65-74 (N = 290)	75-84 (N = 52)	85+ (N = 5)		
Current Behaviors							
Low BMI	1 (0.2)	1 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.1)	
Binge eating	30 (7.1)	19 (2.5)	2 (0.8)	1 (2.3)	0 (0.0)	52 (3.5)	
Binge eating and purging	2 (0.5)	0 (0.0)	1 (0.4)	0 (0.0)	0 (0.0)	3 (0.2)	
Behaviors Within the Past Five Years							
Purging in the absence of binge eating	39 (8.1)	64 (7.9)	17 (7.5)	2 (5.9)	0 (0.0)	122 (7.8)	
Past Behaviors							
Low BMI	91 (18.2)	168 (20.6)	43 (18.7)	7 (20.0)	0 (0.0)	309 (19.5)	
Binge eating	26 (6.2)	33 (4.4)	8 (3.2)	1 (2.3)	0 (0.0)	68 (4.6)	
Binge eating and purging	9 (2.1)	11 (1.5)	1 (0.4)	0 (0.0)	0 (0.0)	21 (1.4)	

Columns 100% due to missing data.

Table 4

Frequencies of weight control and checking behaviors in entire sample by age

Category	Age Groups No. (%), unless otherwise noted					Total (N = 1849)
	50-54 (N = 555)	55-64 (N = 947)	65-74 (N = 290)	75-84 (N = 52)	85+ (N = 5)	
<i>Weight control and checking behaviors</i>						
Current weight loss attempt	399 (74.3)	651 (70.6)	203 (71.2)	26 (53.1)	2 (40.0)	1281 (71.2)
Time spent dieting ^a	221 (4.5)	310 (33.7)	91 (32.3)	13 (26.5)	2 (40.0)	637 (35.6)
Body checking ^b	248 (46.1)	396 (42.9)	81 (28.5)	15 (30.6)	1 (20.0)	741 (41.2)
Frequent weighing ^c	193 (35.9)	374 (40.6)	128 (44.9)	22 (44.9)	3 (60.0)	720 (40.0)
<i>Other maladaptive weight control behaviors</i>						
Vomiting	13 (2.3)	7 (0.7)	3 (1.0)	0 (0.0)	0 (0.0)	23 (1.2)
Laxatives	21 (3.8)	17 (1.8)	1 (0.3)	1 (1.9)	0 (0.0)	40 (2.2)
Diuretics	16 (2.9)	25 (2.6)	6 (2.1)	0 (0.0)	0 (0.0)	47 (2.5)
Diet Pills	60 (10.8)	63 (6.7)	15 (5.2)	0 (0.0)	0 (0.0)	138 (7.5)
Excessive exercise	46 (8.3)	63 (6.7)	15 (5.2)	2 (3.8)	0 (0.0)	126 (6.8)

Columns 100% due to missing data.

^a half the time or more^b daily or more^c couple of times a week or more

Table 5

Frequencies of weight and shape concerns for entire sample by age

Category	Age Groups No. (%), unless otherwise noted					Total (N = 1849)
	50-54 (N = 555)	55-64 (N = 947)	65-74 (N = 290)	75-84 (N = 52)	85+ (N = 5)	
<i>Weight and Shape Concerns</i>						
Impact of weight/shape on life ^a	361 (67.6)	567 (61.7)	150 (53.4)	22 (45.8)	4 (80.0)	1104 (61.8)
Weight/shape on self-perception ^b	443 (82.2)	736 (80.0)	201 (71.0)	36 (73.5)	4 (80.0)	1420 (79.1)
Thoughts of weight ^c	365 (67.8)	596 (64.5)	165 (58.1)	19 (41.3)	4 (80.0)	1149 (63.9)
Upset to gain five pounds ^d	337 (62.5)	589 (63.9)	185 (65.6)	28 (57.1)	5 (100.0)	1144 (63.7)
<i>Less Satisfied in Comparison to Youth</i>						
Stomach	445 (85.1)	759 (83.4)	238 (85.3)	35 (71.4)	5 (100.0)	1482 (83.9)
Shape	388 (73.8)	671 (73.7)	206 (73.8)	27 (55.1)	5 (100.0)	1297 (73.3)
Skin	357 (68.4)	641 (71.1)	195 (70.1)	33 (68.8)	4 (80.0)	1230 (70.1)
Weight	389 (73.8)	642 (70.5)	199 (70.8)	26 (53.1)	4 (80.0)	1260 (71.1)
Arms	335 (64.1)	608 (67.4)	182 (65.7)	27 (55.1)	3 (60.0)	1155 (65.8)
Face	282 (53.7)	492 (54.1)	148 (54.0)	27 (57.4)	3 (60.0)	952 (54.1)
Thighs	329 (62.8)	528 (58.1)	131 (47.5)	21 (42.9)	3 (60.0)	1012 (57.4)
Overall appearance	344 (67.6)	588 (67.4)	174 (63.7)	23 (52.3)	3 (60.0)	1132 (66.4)

Columns 100% due to missing data.

^aConcerns negatively impact life occasionally or often^bweight or body shape is moderate to the most important thing that affects how I feel about myself^cdaily or more^dmoderate to extremely upset

Table 6

Mean age and BMI of individuals who endorsed/did not endorse weight control and weight and shape concerns

Variable	Age Mean Years (SD)		BMI Mean kg/m ² (SD)			
	No	Yes	No	Yes		
Weight control and checking behaviors						
Current weight loss attempt	59.8 (7.3)	58.8 (6.5)	0.015	25.0 (6.6)	28.4 (6.3)	<.001
Time spent dieting ^a	59.5 (6.8)	58.4 (6.5)	0.003	26.4 (6.3)	29.3 (6.6)	<.001
Body checking ^b	59.8 (7.1)	58.0 (6.1)	<.001	27.4 (6.7)	27.5 (6.4)	0.973
Frequent weighing ^c	58.7 (6.6)	59.6 (6.9)	0.020	27.9 (7.0)	26.7 (5.7)	0.001
Other maladaptive weight control behaviors						
Vomiting	59.1 (6.8)	55.7 (5.2)	0.048	27.4 (6.5)	29.1 (8.6)	0.551
Laxatives	59.1 (6.8)	56.1 (5.1)	0.020	27.4 (6.5)	29.2 (6.7)	0.227
Diuretics	59.1 (6.8)	57.4 (5.6)	0.244	27.3 (6.5)	31.4 (6.6)	<.001
Diet Pills	59.3 (6.8)	56.5 (5.3)	<.001	27.2 (6.5)	30.5 (6.5)	<.001
Excessive exercise	59.2 (6.8)	57.4 (6.0)	0.015	27.4 (6.6)	27.8 (6.4)	0.817
Weight and shape concerns						
Impact of weight/shape on life ^d	60.1 (7.0)	58.4 (6.4)	<.001	25.1 (5.2)	28.9 (6.9)	<.001
Weight/shape on self-perception ^e	60.3 (7.1)	58.7 (6.6)	<.001	27.6 (6.5)	27.4 (6.6)	0.945
Thoughts of weight ^f	60.0 (7.2)	58.5 (6.4)	<.001	25.6 (6.0)	28.5 (6.6)	<.001
Upset to gain five pounds ^g	59.0 (6.8)	59.1 (6.7)	0.952	26.7 (7.0)	27.9 (6.3)	0.001
Less satisfied in comparison to youth						
Stomach	59.5 (7.1)	59.0 (6.6)	0.498	24.5 (5.6)	28.0 (6.6)	<.001
Shape	59.5 (7.2)	58.9 (6.6)	0.377	24.5 (5.6)	28.5 (6.5)	<.001
Skin	58.9 (6.9)	59.1 (6.7)	0.793	28.4 (6.6)	27.0 (6.5)	<.001
Weight	59.7 (7.1)	58.8 (6.6)	0.048	23.7 (5.3)	29.0 (6.4)	<.001
Arms	59.2 (7.2)	59.0 (6.5)	0.793	25.3 (5.4)	28.6 (6.8)	<.001
Face	58.9 (6.7)	59.1 (6.7)	0.793	27.8 (6.7)	27.2 (6.5)	0.194
Thighs	60.0 (7.1)	58.4 (6.4)	<.001	25.3 (5.2)	29.0 (7.0)	<.001

Variable	Age Mean Years (SD)		BMI Mean kg/m ² (SD)	
	No	Yes	No	Yes
Overall appearance	59.6 (7.2)	58.8 (6.4)	25.0 (5.2)	28.7 (6.8)
		FDR-p-value		FDR-p-value
		0.054		<.001

Columns 100% due to missing data. Each row indicates a separate test. P-value is a permutation-adjusted p-value and the group of p-values are FDR adjusted by outcome

^a half time or more

^b daily or more

^c couple of times a week or more

^d Concerns negatively impact life occasionally or often

^e weight or body is moderate to most important thing that affects how I feel about myself

^f daily or more

^g moderate to extremely upset

Table 7
Comparison of eating disorder symptom groups on current weight control behaviors and weight and shape concerns

Variable	CurrentEDS N (%)	PastEDS N (%)	NoEDS N (%)	CurrentEDS vs. NoEDS, FDR-p-value	CurrentEDS vs. PastEDS, FDR-p-value	PastEDS vs. NoEDS, FDR-p-value
Weight control and checking behaviors						
Weight loss attempts ^a	148 (82.7)	239 (64.6)	555 (70.3)	0.028	<.001	0.850
Time spent dieting ^b	105 (58.7)	117 (31.6)	228 (28.9)	<.001	<.001	>.0999
Body checking ^c	99 (55.6)	159 (42.9)	282 (35.7)	<.001	0.166	0.412
Weighing frequency ^d	76 (42.5)	146 (39.6)	308 (38.9)	>.0999	>.0999	>.0999
Other maladaptive weight control behaviors						
Vomiting	9 (5.0)	7 (1.9)	0 (0.0)	<.001	0.856	0.010
Laxatives	17 (9.5)	8 (2.2)	0 (0.0)	<.001	0.009	0.004
Diuretics	29 (16.2)	2 (0.5)	0 (0.0)	<.001	<.001	>.0999
Diet Pills	78 (43.6)	17 (4.6)	0 (0.0)	<.001	<.001	<.001
Excessive exercise	56 (31.3)	25 (6.7)	0 (0.0)	<.001	<.001	<.001
Weight and shape concerns						
Impact of weight/shape ^e	152 (85.9)	222 (60.5)	426 (53.8)	<.001	<.001	0.637
Weight/shape on self perception ^f	156 (87.2)	304 (82.2)	586 (74.1)	0.005	>.0999	0.065
Thoughts on weight ^g	139 (77.7)	224 (60.5)	465 (58.9)	<.001	0.003	>.0999
Upset to gain five pounds ^h	134 (75.3)	229 (61.9)	467 (59.1)	0.002	0.063	>.0999
Less satisfied in comparison to youth						
Stomach	157 (87.7)	301 (82.5)	647 (83.1)	>.0999	>.0999	>.0999
Shape	142 (79.3)	249 (68.6)	567 (72.3)	0.863	0.248	>.0999
Skin	115 (65.0)	288 (79.8)	509 (65.7)	>.0999	0.011	<.001
Weight	146 (81.6)	229 (62.6)	554 (70.6)	0.087	<.001	0.198
Arms	130 (73.4)	228 (63.2)	490 (62.8)	0.226	0.412	>.0999
Face	97 (54.2)	219 (60.7)	392 (50.2)	>.0999	>.0999	0.035
Thighs	128 (72.7)	200 (55.2)	422 (53.8)	<.001	0.005	>.0999
Overall appearance	133 (75.1)	231 (66.2)	474 (62.7)	0.051	0.657	>.0999

Columns 100% due to missing data. Each row indicates a separate test. P-value is a permutation-adjusted p-value and the group of p-values are FDR adjusted by outcome. Some respondents in the past group (i.e., no current symptoms) did positively endorse the item assessing purging in the past five years (vomiting, laxatives, diuretics, diet pills, excessive exercise).

^a currently trying to lose weight

^b half time or more

^c daily or more

^d couple of times a week or more

^e Concerns negatively impact life occasionally or often

^f weight or body shape is moderate to the most important thing that affects how I feel about myself

^g daily or more

^h moderate to extremely upset