



## Identification as overweight by medical professionals: Relation to eating disorder diagnosis and risk ☆☆☆★



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### ABSTRACT

**Purpose:** Discussions about weight between medical professionals and young adults may increase risk of eating disorders (EDs). Clarifying the relation between screening for overweight and ED risk is needed.

**Methods:** 548 college-age women were classified as at-risk ( $n = 441$ ) or with an ED ( $n = 107$ ), and were assessed for disordered eating attitudes, behaviors, and relevant history, including, "Has a doctor, nurse, or other medical professional ever told you that you were overweight?" Regression analyses were used to evaluate the relations between being identified as overweight and current disordered eating behaviors, attitudes, and ED diagnosis, without and with covariates (history of weight-related teasing, history of an ED, family history of being identified as overweight, and current body mass index).

**Results:** 146 (26.6%) women reported being previously identified as overweight by a medical professional. There was no relation between being previously identified as overweight and having an ED. Those identified as overweight were more likely to have weight/shape concerns above a high-risk cutoff, but showed no difference in dietary restraint, binge eating, purging behaviors, or excessive exercise compared to those not identified.

**Conclusions:** Being previously identified as overweight by a medical professional was associated with increased weight/shape concerns but not with current disordered eating behaviors or ED status. Minimizing the potential negative effects of overweight screening on weight and shape concerns by providing patients with strategies to increase healthy lifestyle behaviors and long-term support for healthy weight loss goals may have a positive impact on reducing the public health problem of overweight and obesity.

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### 1. Introduction

The pediatric and primary care settings are ideal environments through which to screen and intervene with patients who are overweight and obese and their families, as medical professionals are often the first line of contact for families and routine visits allow for monitoring and follow-up (Wilfley, Kass, & Kolko, 2011 Dec). However, medical professionals are not routinely screening for overweight and obesity among children and adults, despite recommendations for screening and intervention from the Institute of Medicine, the U.S. Preventive Services Task Force, and the Expert Committee as endorsed by the American Academy of Pediatrics (Barlow, 2007 Dec; Barton, 2010 Feb;

Institute of Medicine, 2012; Moyer, 2012 Sep). Screening and early intervention are critical, as elevated childhood body mass index (BMI) robustly predicts continued weight gain and elevated adult BMI (Nader et al., 2006 Sep; Stovitz, Pereira, Vazquez, Lytle, & Himes, 2008 Oct). Elevated BMI is problematic, as it confers increased risk for development of chronic diseases (e.g., type II diabetes mellitus, cardiovascular disease) and eating disorders if weight-related issues are not addressed (Barlow, 2007 Dec; Goldschmidt, Aspen, Sinton, Tanofsky-Kraff, & Wilfley, 2008 Feb; Wilfley et al., 2011 Dec).

Medical professionals report several barriers that preclude screening and intervention for overweight and obesity, such as lack of time in session to address weight (Klein et al., 2010 Feb; Sesselberg, Klein, O'Connor, & Johnson, 2010 May–Jun; Tham & Young, 2008), lack of referral options (Sesselberg et al., 2010 May–Jun), feelings of discomfort approaching the topic of weight status (Bardia, Holtan, Slezak, & Thompson, 2007 Aug; Jay et al., 2008 Jul; Jay et al., 2009; Sesselberg et al., 2010 May–Jun; Tham & Young, 2008), concerns of offending patients and their family members (Bardia et al., 2007 Aug; Barlow, 2007 Dec; Sesselberg et al., 2010 May–Jun), and beliefs that they have inadequate training/competency in weight loss techniques

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(Forman-Hoffman, Little, & Wahls, 2006; Jay et al., 2008 Jul; Jay et al., 2009; Klein et al., 2010 Feb; Tham & Young, 2008). Clinicians are also concerned about the iatrogenic effects of screening for overweight on risk for eating disorders (Atkinson & Nitzke, 2001 Nov 3; Berg, Buechner, & Parham, 2003 Jan–Feb; Carter & Bulik, 2008 Apr; Celio, Bryson, Killen, & Taylor, 2003 Sep; Hawks & Gast, 2000; O’Dea, 2005 Apr; Striegel-Moore, 2001 Jul), as heightened attention to weight and body shape may increase risk for disordered eating attitudes and behaviors (e.g., dietary restraint, compensatory behaviors) (Haines & Neumark-Sztainer, 2006 Dec; Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004 Jan). Moreover, given that critical comments about shape/weight from a parent, teacher, coach, or sibling are associated with disordered eating behaviors and increased eating disorder risk (Jacobi et al., 2011 Sep; Neumark-Sztainer et al., 2010 Sep), it is possible that comments about weight from other authority figures such as a medical professional may also have an adverse effect on eating disorder risk. However, to our knowledge, no studies have investigated whether identifying individuals as overweight in the primary care setting increases eating disorder risk. Clarifying the relation between overweight identification and eating disorder risk is needed, as dispelling barriers to screening may help to increase medical professionals’ likelihood of offering routine screening and intervention in the pediatric and primary care settings.

This study evaluated whether patients who were previously identified as overweight by a medical professional were more likely to have an eating disorder. In line with the exploratory notion that comments about weight from an authority figure such as a medical professional may have an adverse effect on eating disorder risk, we hypothesized that being previously identified as overweight would be associated with increased likelihood of having an eating disorder. Exploratory analyses to evaluate increased likelihood of endorsing disordered eating attitudes (i.e., high-risk weight/shape concerns) and behaviors (i.e., dietary restraint, binge eating, purging behaviors, and excessive exercise) associated with being identified as overweight were also conducted. Results from this study may help to dispel barriers to screening, thereby enhancing early detection of overweight and obesity and increasing the potential for early intervention.

## 2. Methods

### 2.1. Participants

Five hundred forty-nine college-age women, ages 18–25, were recruited for participation as part of a larger randomized controlled trial. Individuals were recruited primarily from private and public universities in the San Francisco Bay, Sacramento, and Saint Louis metropolitan areas; however, women residing in local areas who were in the age range of our sample but not currently enrolled in school were also recruited to participate. Interested participants were excluded from study participation if they were actively suicidal, did not reside in the local area of the study sites, were male, or anticipated being unavailable at the time of follow-up. One individual did not respond to the question about whether they had been previously identified as overweight by a medical professional, precluding them from being included in the present analyses; thus, the final sample comprised 548 women.

### 2.2. Procedures

Participants were recruited using flyers, e-mail, Facebook, word-of-mouth, and a research volunteer database (only at Washington University). Recruitment advertisements were broadly targeted at women concerned about their weight or shape and/or wanting to improve feelings about one’s body or mood and reduce stress. Interested participants were sent e-mails with instructions to complete an online screening questionnaire and were then invited to complete an in-person assessment. Informed consent was obtained prior to completion of the online

screen and again prior to the in-person assessment. This study was approved by the Institutional Review Boards at all participating sites.

### 2.3. Measures

#### 2.3.1. Demographics & relevant medical history

Participants reported their age, race/ethnicity, and mother or father’s highest level of education (as a proxy measure for socioeconomic status). Participants also reported whether they had a history of an eating disorder, family history of an eating disorder, or history of being teased about weight, shape, or body size by a teacher, coach, or sibling, as weight-related teasing is associated with eating disorder risk (Eddy et al., 2007 Oct; Haines, Kleinman, Rifas-Shiman, Field, & Austin, 2010 Apr; Keery, Boutelle, van den Berg, & Thompson, 2005 Aug; Libbey, Story, Neumark-Sztainer, & Boutelle, 2008 Nov; Neumark-Sztainer et al., 2002 Jan). Relevant medical history and previous identification as overweight were determined by the following question: “Has a doctor, nurse, or other medical professional ever told you that you were overweight?” Given the high rates of overweight within families (Martin, 2008; Whitaker, Wright, Pepe, Seidel, & Dietz, 1997 Sep 25) and the possibility that having a family member identified as overweight may increase the likelihood of the participant being identified, we also assessed family history of being identified as overweight using the following question: “Has a doctor, nurse, or other medical professional ever told a member of your immediate family that he/she was overweight?” Both questions were answered with yes or no response options.

#### 2.3.2. Eating Disorder Examination (EDE)

Trained research assistants administered the EDE Version 14.0, a semi-structured interview that is considered the “gold standard” measure for the assessment of eating disorder pathology (Cooper, Cooper, & Fairburn, 1989 Jun). Responses are rated from 0–6 on a Likert-type scale, with higher scores indicating greater pathology or greater frequency of a weight control behavior. The EDE was used to determine current eating disorder diagnoses; specifically, individuals were classified as having a clinical or subclinical eating disorder (i.e., anorexia nervosa, bulimia nervosa, binge eating disorder, or feeding and eating disorder not elsewhere classified) based on DSM-5 criteria (American Psychiatric Association, 2013). Episodes of objective binge eating, subjective binge eating, vomiting, laxative use, diuretic use, and excessive exercise in the past three months were also assessed. For the purposes of this study, vomiting, laxative use, and diuretic use were combined into one variable of purging behaviors, given that the small number of people who endorsed each behavior precluded separate analyses.

#### 2.3.3. Eating Disorder Examination–Questionnaire (EDE-Q)

The EDE-Q (Fairburn & Beglin, 1994 Dec) is a self-report version of the EDE, which assesses eating disorder pathology over the past 28 days. It consists of 39 items that yield four subscales (Restraint, Eating Concern, Shape Concern, and Weight Concern) and a global score. Responses are recorded on a Likert-type scale of 0–6, with higher scores indicating greater frequency or severity of pathological behavior. For the purposes of this study, only the Restraint Subscale was included in the analyses as an indicator of dietary restraint. The other subscales were not used given that the Weight Concerns Scale provided an assessment of concerns about weight and shape.

#### 2.3.4. Weight Concerns Scale (WCS)

The WCS (Killen et al., 1994 Nov) is a five-question, self-report questionnaire that assesses concerns about shape and weight, fear of weight gain, dieting frequency, importance of weight, and feelings of fatness. The total score ranges from 0 to 100. Higher scores indicate higher shape and weight pathology. A score of 47 or higher suggests increased risk for developing an eating disorder (Jacobi, Abascal, & Taylor, 2004 Nov; Taylor, Bryson, Luce, et al., 2006 Aug).

### 2.3.5. Anthropometric data

Anthropometric data were obtained by trained research assistants. Participants' height and weight were measured using a portable stadiometer and a digital stand-on scale. Participants were asked to remove their shoes and coats prior to being weighed. Measurements were taken twice; if the measures differed by more than 0.4 cm or 0.2 kg for height and weight, respectively, a third measurement was taken. The averages of these heights and weights were used to calculate participants' BMI.

### 2.4. Analytic plan

Statistical analyses were performed using SPSS version 21.0. All tests were two-tailed, and  $p$ -values  $< 0.05$  were considered statistically significant. Independent sample  $t$ -tests and chi-squared tests were performed to evaluate differences in demographic variables between those who were previously identified as overweight and those who were not. Between-group differences in history of an eating disorder, history of weight-related teasing, family history of an eating disorder, and whether an immediate family member had been previously identified as overweight by a medical professional were each assessed using chi-squared tests.

To examine the relation between being identified as overweight and our primary outcome variable, DSM-5 eating disorder diagnosis, we built a series of logistic regression models for each separate outcome. Women who did not have an eating disorder served as the reference category. First, we tested an unadjusted model (Model 1) that examined only "previously identified as overweight" as the independent variable. The second model adjusted for historical variables (i.e., history of weight-related teasing, history of an eating disorder, and family history of being identified as overweight) that were associated with eating disorder risk and diagnosis (Model 2). The final model controlled for all of the variables in Model 2, as well as the addition of current BMI.

To examine our secondary outcome variables (i.e., high-risk weight and shape concerns, dietary restraint, objective binge episodes, subjective binge episodes, purging behaviors, and excessive exercise) a series of logistic and linear regression models were developed for each separate outcome. Three models, built as specified above, were used. For analyses involving high-risk weight and shape concerns, a cut-off of 47 was used (Jacobi, Abascal, & Taylor, 2004 Nov; Taylor, Bryson, Luce, et al., 2006 Aug), as this has been associated with increased risk for developing an eating disorder. A score of less than 47 served as the reference category. For analyses involving objective binge episodes, subjective binge episodes, purging behaviors, and excessive exercise, diagnostic cut-offs based on DSM-5 criteria (American Psychiatric Association, 2013) were used to increase the relevancy of the results for medical professionals. Specifically, the outcome variables were trichotomized as "endorsed no episodes," "endorsed  $< 12$  episodes," or "endorsed  $\geq 12$  episodes" of the target behavior, as this serves as the DSM-5 cut-off for binge episodes and compensatory behaviors. "Endorsed no episodes" served as the reference category.

Analyses were also conducted using loss of control episodes (defined as objective plus subjective binge episodes) and compensatory behaviors (defined as purging behaviors plus excessive exercise) as outcome variables. For analyses evaluating loss of control episodes, the pattern of results obtained was identical across the three models to results evaluating subjective binge episodes. For analyses evaluating compensatory behaviors, the pattern of results obtained was identical across the three models to results evaluating purging behaviors and results evaluating excessive exercise.

## 3. Results

One hundred and forty-six (26.6%) women reported having been previously identified as overweight by a medical professional. Differences in demographic variables between those who were identified as

overweight and those who were not are presented in Table 1. There were significant between-group differences in racial/ethnic categories, with individuals who identified as Black or Hispanic having higher rates of being identified as overweight compared to individuals who identified as White or Other. Individuals identified as overweight had a significantly higher current BMI (mean = 28.71 (SD = 5.80)) compared to individuals not identified as overweight (mean = 22.97 (SD = 3.68)). There were also significant between-group differences in having a history of weight-related teasing (67.8% vs. 56.5%,  $\chi^2 = 5.7$ ,  $p = 0.018$ ) and having an immediate family member identified as overweight (65.1% vs. 37.6%,  $\chi^2 = 35.2$ ,  $p < 0.001$ ). Descriptive data on eating disorder risk/symptom status and disordered eating attitudes and behaviors between those who were identified as overweight and those who were not are presented in Table 2, and analyses evaluating between-group differences are described below.

### 3.1. Previous identification of overweight status and eating disorder diagnosis

Results from the unadjusted (Model 1) and adjusted models (Models 2 and 3) are presented in Table 3. In the unadjusted model, there were no significant differences between likelihood of being previously identified as overweight between women with and without an eating disorder diagnosis. Between-group differences remained non-significant in the full model controlling for all covariates (Models 2 and 3). These results suggest that identifying patients as overweight is not associated with eating disorder case status.

### 3.2. Previous identification of overweight status and eating disorder attitudes and behaviors

Results from the unadjusted (Model 1) and adjusted models (Models 2 and 3) are presented in Table 3. Being identified as overweight was significantly related to high-risk weight and shape concerns in the unadjusted model and remained significant in the full model controlling for all covariates (Model 3). No significant effect was found for dietary restraint in the unadjusted or the adjusted models. In the unadjusted model, women who endorsed  $\geq 12$  episodes of objective binge episodes were significantly more likely to have been identified as overweight compared to those who did not endorse objective binge eating. This effect did not remain in the model adjusting for the historical covariates (Model 2) and remained non-significant in the full model

**Table 1**  
Sample characteristics, by group.

	Identified as overweight ( $n = 146$ )	Not identified as overweight ( $n = 402$ )	$p$
	Mean (SD)	Mean (SD)	
Age (years)	20.9 (2.2)	20.5 (1.9)	0.076
Body mass index (kg/m <sup>2</sup> )	28.7 (5.8)	23.0 (3.7)	<0.001*
	$n$ (%)	$n$ (%)	
Race/ethnicity			<0.001*
White/Caucasian	71 (48.6%)	233 (58.0%)	
Black/African American	23 (15.8%)	25 (6.2%)	
Hispanic/Latino/Mexican origin	21 (14.4%)	25 (6.2%)	
Multiethnic/other	31 (21.2%)	119 (29.6%)	
Highest level of parent education			0.054
Less than high school	6 (4.1%)	5 (1.2%)	
High school degree	41 (28.1%)	107 (26.6%)	
College degree	41 (28.1%)	94 (23.4%)	
Graduate degree	57 (39.0%)	196 (48.8%)	
History of an eating disorder	13 (8.9%)	52 (12.9%)	0.233
Family history of an eating disorder	21 (14.4%)	63 (15.7%)	0.789
History of weight-related teasing	99 (67.8%)	227 (56.5%)	0.018*
Immediate family member identified as overweight	95 (65.1%)	151 (37.6%)	<0.001*

\*  $p < 0.05$ .

**Table 2**

Descriptive data on eating disorder diagnosis, disordered eating attitudes, and disordered eating behaviors, by group.

	Identified as overweight (n = 146)	Not identified as overweight (n = 402)	p
	n (%)	n (%)	
DSM-5 eating disorder diagnosis			0.182
No eating disorder	112 (76.7%)	329 (81.2%)	
Eating disorder	34 (23.3%)	73 (18.2%)	
	Mean (SD)	Mean (SD)	
Dietary restraint	2.0 (1.3)	2.0 (1.3)	0.699
	n (%)	n (%)	
Weight & shape concerns			<0.001*
<47 score	28 (19.2%)	173 (43.0%)	
≥47 score	118 (80.8%)	229 (57.0%)	
Objective binge episodes <sup>a</sup>			0.080
0 episodes	108 (74.0%)	319 (79.4%)	
<12 episodes	22 (15.1%)	61 (15.2%)	
≥12 episodes	16 (11.0%)	22 (5.5%)	
Subjective binge episodes <sup>a</sup>			<0.001*
0 episodes	70 (47.9%)	266 (66.2%)	
<12 episodes	37 (25.3%)	71 (17.7%)	
≥12 episodes	39 (26.7%)	65 (16.2%)	
Purging behaviors <sup>a</sup>			0.942
0 episodes	130 (89.0%)	357 (88.8%)	
<12 episodes	12 (8.2%)	31 (7.7%)	
≥12 episodes	4 (2.7%)	13 (3.2%)	
Excessive exercise <sup>a</sup>			0.706
0 episodes	119 (81.5%)	330 (82.1%)	
<12 episodes	5 (3.4%)	19 (4.7%)	
≥12 episodes	22 (15.1%)	53 (13.2%)	

<sup>a</sup> Assessed over previous 3 months.\*  $p < 0.05$ .

controlling for all covariates (Model 3). Individuals who endorsed sub-threshold and threshold levels of subjective binge episodes were more likely to have been identified as overweight compared to those who did not have any subjective binge episodes (Model 1). These effects did not remain in the full model controlling for all covariates (Model 3). No significant between-group differences emerged regarding the

number of episodes of purging behaviors or excessive exercise in the unadjusted or the adjusted models. These results suggest that identifying patients as overweight is associated with disordered eating attitudes [i.e., high-risk weight and shape concerns, an eating disorder risk factor (Haines & Neumark-Sztainer, 2006 Dec; Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004 Jan)], even when covariates were considered. However, in relation to eating disorder behaviors, identifying patients as overweight was not associated with binge eating when covariates were considered and was not associated with dietary restraint, purging behaviors, and excessive exercise.

#### 4. Discussion

Best practices for obesity intervention suggest that medical professionals should screen for overweight and make recommendations for healthy weight loss and weight regulation (Barlow, 2007 Dec; Barton, 2010 Feb; Institute of Medicine, 2012; Moyer, 2012 Sep). However, medical professionals are not consistently screening for overweight, in part due to concerns of increasing risk for eating disorders (Atkinson & Nitzke, 2001 Nov 3; Berg et al., 2003 Jan–Feb; Carter & Bulik, 2008 Apr; Celio et al., 2003 Sep; Hawks & Gast, 2000; O'Dea, 2005 Apr; Striegel-Moore, 2001 Jul). In contrast to our hypotheses, results indicated that being previously identified as overweight by a medical professional was not associated with increased likelihood of having a current eating disorder diagnosis. Moreover, being previously identified as overweight was not associated with increased likelihood of engaging in disordered eating behaviors (i.e., dietary restraint, binge eating, purging, or excessive exercise) when accounting for current BMI. However, participants who had been identified by a medical professional as overweight were significantly more likely to have high-risk weight and shape concerns than those not previously identified as overweight, regardless of current BMI. Given that high-risk weight and shape concerns can increase an individual's risk for developing an eating disorder, these results reflect the challenge of encouraging individuals who are overweight to lose weight without increasing eating disorder risk. As such, it is crucial for medical professionals to ensure they address weight

**Table 3**

Unadjusted and adjusted associations between being previously identified as overweight and disordered eating attitudes and behaviors.

		Model 1 <sup>a</sup>		Model 2 <sup>b</sup>		Model 3 <sup>c</sup>		
<b>Logistic regression</b>								
<b>Outcome</b>	<b>% (n)</b>	<b>OR (95% CI)</b>	<b>p</b>	<b>OR (95% CI)</b>	<b>p</b>	<b>OR (95% CI)</b>	<b>p</b>	
No eating disorder diagnosis	80.5% (441)	1.00		1.00		1.00		
DSM-5 eating disorder	19.5% (107)	1.37 (0.86, 2.17)	0.182	1.32 (0.81, 2.13)	0.264	1.22 (0.71, 2.10)	0.476	
<b>Linear regression</b>								
<b>Outcome</b>		<b>B (95% CI)</b>	<b>p</b>	<b>B (95% CI)</b>	<b>p</b>	<b>B (95% CI)</b>	<b>p</b>	
Dietary restraint		0.05 (−0.20, 0.29)	0.699	−0.01 (−0.27, 0.24)	0.922	0.19 (−0.09, 0.48)	0.186	
<b>Logistic regression</b>								
<b>Outcome</b>	<b>Categories</b>	<b>% (n)</b>	<b>OR (95% CI)</b>	<b>p</b>	<b>OR (95% CI)</b>	<b>p</b>	<b>OR (95% CI)</b>	<b>p</b>
Weight & shape concerns	<47 score	36.7% (201)	1.00		1.00		1.00	
	≥47 score	63.3% (347)	3.18 (2.02, 5.03)	<0.001*	2.81 (1.74, 4.54)	<0.001*	2.21 (1.29, 3.77)	0.004*
Objective binge episodes <sup>d</sup>	0 episodes	77.9% (427)	1.00		1.00		1.00	
	<12 episodes	15.1% (83)	1.07 (0.62, 1.82)	0.816	0.96 (0.55, 1.67)	0.875	0.65 (0.34, 1.22)	0.180
	≥12 episodes	6.9% (38)	2.15 (1.09, 4.24)	0.028*	1.95 (0.94, 4.04)	0.074	1.56 (0.68, 3.59)	0.294
Subjective binge episodes <sup>d</sup>	0 episodes	61.3% (336)	1.00		1.00		1.00	
	<12 episodes	19.7% (108)	1.98 (1.23, 3.19)	0.005*	1.97 (1.20, 3.25)	0.008*	1.53 (0.87, 2.69)	0.138
	≥12 episodes	18.9% (104)	2.28 (1.42, 3.67)	0.001*	2.08 (1.26, 3.44)	0.004*	1.71 (0.97, 3.02)	0.065
Purging behaviors <sup>d</sup>	0 episodes	89.0% (487)	1.00		1.00		1.00	
	<12 episodes	7.8% (43)	1.06 (0.53, 2.13)	0.863	1.21 (0.56, 2.60)	0.628	1.85 (0.78, 4.43)	0.166
	≥12 episodes	3.1% (17)	0.85 (0.27, 2.64)	0.772	0.79 (0.24, 2.56)	0.689	1.68 (0.45, 6.29)	0.444
Excessive exercise <sup>d</sup>	0 episodes	81.9% (449)	1.00		1.00		1.00	
	<12 episodes	4.4% (24)	0.73 (0.27, 2.00)	0.540	0.78 (0.27, 2.22)	0.641	1.68 (0.52, 5.42)	0.385
	≥12 episodes	13.7% (75)	1.15 (0.67, 1.97)	0.609	1.15 (0.65, 2.02)	0.630	1.10 (0.58, 2.08)	0.770

<sup>a</sup> Model 1: unadjusted.<sup>b</sup> Model 2: adjusted for history of weight-related teasing, history of an eating disorder, and family history of being identified as overweight.<sup>c</sup> Model 3: adjusted for Model 2 covariates, plus current body mass index (kg/m<sup>2</sup>).<sup>d</sup> Assessed over previous 3 months.\*  $p < 0.05$ .

issues in a productive manner that both motivates and facilitates weight loss while remaining sensitive to eating disorder risk.

Incorporating eating disorder prevention with obesity intervention is useful for encouraging healthful and non-harmful weight regulation practices (Austin, 2011 Jun; Austin et al., 2012). Towards this end, medical professionals can employ several strategies for addressing weight in a healthful, non-harmful manner. For example, conversations between parents and children that focus on healthy eating and activity, versus conversations that focus solely on weight, are less likely to result in unhealthy weight control practices (Berge et al., 2013 Aug 1). Medical professionals can employ a similar approach by assessing patients' overall health and providing patients with behavioral strategies that increase healthy lifestyle behaviors while minimizing risk for eating disorder pathology. Specifically, in addition to diagnosing weight status, providers are encouraged to evaluate and talk with patients about their overall health and wellness (e.g., diet, physical activity, disturbed eating behaviors, comorbid medical conditions, sleep, mood). It is important for providers to remain aware that BMI is not a direct indication of healthy behaviors or lack thereof (e.g., it is possible for someone with a BMI  $\geq 25$  to have healthy lifestyle patterns, whereas it is also possible for someone with a BMI  $< 25$  to have unhealthy lifestyle patterns), and thus discussion of healthy behaviors is encouraged for patients across the BMI spectrum. Patients and families aiming to improve their weight regulation efforts in consultation with their provider can be offered behavioral strategies in session, such as self-monitoring, goal-setting, stimulus control, and appetite awareness (Wilfley et al., 2011 Dec). Given that health care professionals may perceive that they have inadequate training/competency in weight loss techniques (Forman-Hoffman et al., 2006; Jay et al., 2008 Jul; Jay et al., 2009; Klein et al., 2010 Feb; Tham & Young, 2008), opportunities to increase health care professionals' awareness of resources for healthy weight regulation may increase their likelihood of offering referrals to patients who would like further follow-up. Providers can make patients aware that evidence-based interventions exist and direct them to appropriate resources, thereby ensuring patients screened as overweight are provided with comprehensive services relevant to their health needs. Over time, providers can monitor weight, eating and activity behaviors, and unhealthy weight control practices, engage patients in dialogue about their progress, and seek feedback from patients on their reactions to in-session counseling for healthy behavior change.

It is important for medical professionals to remain attuned to the potential to increase weight/shape concerns and, as such, eating disorder risk. It is advantageous for providers to approach conversations about overweight in a non-shameful manner and maintain rapport, given that (a) overt stigma can impede weight loss outcomes, (b) physicians may build less emotional rapport with overweight or obese patients and patients have reduced trust when they feel judged about their weight by a provider, and (c) feelings of shame may prevent patients from seeking provider counseling in the future (Gudzune, Beach, Roter, & Cooper, 2013 Oct; Gudzune, Bennett, Cooper, & Bleich, 2014 Oct; Puhl, Peterson, & Luedicke, 2011 Oct; Puhl, Peterson, & Luedicke, 2013 Apr; Wadden et al., 2000 Sep–Oct; Ward, Gray, & Paranjape, 2009 May; Wott & Carels, 2010 May). Addressing barriers that may lead to the early discontinuation of behavior change goals can also be helpful, as individuals with a history of weight loss attempts may be more likely to engage in disordered eating behaviors (Haines & Neumark-Sztainer, 2006 Dec; Vannucci et al., 2014 May). Establishing realistic expectations about weight loss goals may offset patients' concerns about their amount or rate of weight change, which might otherwise increase feelings of dissatisfaction (Fabricatore et al., 2007 Nov). When working with families, medical professionals can also empower parents to engage in non-stigmatizing weight-related communication with their youth, model healthy attitudes about weight/shape, discourage teasing in the home and during get-togethers with family and friends, and establish an environment in which youth feel comfortable disclosing concerns to them about weight/shape (Haines & Neumark-

Sztainer, 2006 Dec; Neumark-Sztainer et al., 2010 Sep; Taylor, Bryson, Celio Doyle, et al., 2006 Aug).

Despite the potential to increase weight/shape concerns, not addressing overweight could also result in potential harm. For example, it is possible that being previously identified as overweight served as a protective factor against excess weight gain. More specifically, although the individuals in this study who were previously identified as overweight had a mean current BMI in the overweight range, it is possible that this subset of individuals would have had a mean current BMI in the obese range had their weight status not been addressed by a medical professional, which would have put them at heightened risk for the serious medical and psychosocial consequences, debilitating health care costs, and reduced quality of life associated with obesity (Barlow, 2007 Dec; Wilfley et al., 2011 Dec). Thus, opportunities to engage in routine conversations with patients about their weight status, healthy lifestyle behaviors, and weight/shape concerns may offset the development of disordered eating behaviors. Medical professionals are ideally positioned for this purpose, as they are often a first line of contact for patients (Wilfley et al., 2011 Dec) and can be efficacious in helping adolescents to increase healthy lifestyle behaviors (Pollak et al., 2009 Aug). Opportunities to increase provider training and knowledge on how to appropriately and healthfully engage patients in weight-related conversations may help to reduce barriers to overweight screening and intervention.

In the study sample, African-American and Hispanic women were more likely to be identified as overweight by medical professionals than Caucasian women. African-American and Hispanic individuals are more likely to be overweight than Caucasian individuals (Ogden, Carroll, Kit, & Flegal, 2014 Feb 26), and thus, opportunities for increased screening and intervention are warranted. However, because African-American and/or Hispanic individuals endorse greater concerns about weight and shape (Franko et al., 2012 Apr), evidence greater odds of engaging in disordered weight control behaviors (Austin et al., 2011 Jan), and are likely to have large weight gain associated with dieting (Field et al., 2007 Feb), medical professionals are encouraged to remain particularly attentive to employing strategies aimed to promote healthful, non-harmful approaches to weight regulation with these populations so as not to increase risk for eating disorders.

Strengths of this study include the use of a semi-structured interview to assess current eating disorder case status, use of objective measurement of current height and weight to calculate BMI, and use of a population at elevated risk for weight gain and eating disorders (i.e., college-age women). Additionally, this is the first study to our knowledge to examine the subjective experience of recall for being identified as overweight by a medical professional and its impact on eating disorder risk and disordered eating attitudes and behaviors. Limitations of this study should be noted as well. First, these data are based on retrospective report, measured using one item; individuals' objective weight status at the time when they were identified as overweight is unknown. It is possible that medical professionals used visual assessment and not evidence-based practices of calculating BMI or BMI percentile to make an overweight diagnosis (Barlow, 2007 Dec). As a result, individuals previously identified as overweight may or may not have been above the BMI criterion. Second, given the potential for recall bias, it is also possible that additional individuals were identified as overweight but did not remember the occurrence and thus did not endorse this question in the current study. Third, these data are cross-sectional, precluding our ability to identify a causal relationship between being identified as overweight and high-risk weight and shape concerns. It should also be noted that this study only assessed current disordered eating attitudes and behaviors and did not assess whether individuals had previously engaged in disordered eating attitudes and behaviors.

#### 4.1. Conclusion

In closing, screening for overweight and obesity is critical for addressing the obesity epidemic (Barlow, 2007 Dec; Barton, 2010 Feb;

Institute of Medicine, 2012; Moyer, 2012 Sep). In this study, being identified as overweight by a medical professional was not associated with increased likelihood of having an eating disorder with or without covariates or with disordered eating behaviors (i.e., dietary restraint, binge eating, purging behaviors, excessive exercise) when accounting for individuals' current BMI. However, being identified as overweight was associated with high-risk weight and shape concerns, a risk factor associated with the development of eating disorders. Minimizing the potential negative effects of overweight screening on weight and shape concerns by providing patients with strategies to increase healthy lifestyle behaviors and long-term support for healthy weight loss goals may have a positive impact on reducing the pressing public health problem of overweight and obesity.

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#### Contributors

All authors contributed to and have approved the final manuscript. Andrea E. Kass oversaw the completion of this manuscript, including the study design, literature review, data collection and analysis, interpretation of results, and manuscript preparation. Annie Z. Wang contributed to study design, literature review, data analysis, and manuscript preparation. Rachel P. Kolko contributed to literature review, interpretation of results, and manuscript preparation. Jodi C. Holland contributed to data analysis, interpretation of results, and manuscript preparation. Myra Altman contributed to data collection, interpretation of results, and manuscript preparation. Mickey Trockel contributed to data collection, data analysis, interpretation of results, and manuscript preparation. C. Barr Taylor contributed to study design, data collection, interpretation of results, and manuscript preparation. Denise E. Wilfley contributed to study design, literature review, data collection, interpretation of results, and manuscript preparation.

#### Conflict of interest

All authors declare that they have no conflicts of interest.

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