

Self-Weighing Behavior in Individuals with Eating Disorders

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ABSTRACT

Objective: To describe the frequency of self-weighing and reactions to prescribed weekly weighing among individuals with eating disorder (ED) diagnoses, and to compare individuals weighing more or less frequently on mass index (BMI) and the Eating Disorder Examination (EDE) subscales.

Method: Baseline EDE and demographics from five studies ($N = 758$).

Results: Self-weighing was most frequent among individuals with anorexia nervosa (AN), followed by those with bulimia nervosa (BN) and binge eating disorder (BED). On average, participants reacted moderately negative to prescribed weekly weighing. No relationship between weighing frequency and BMI was evident in any sample. There was indication of greater pathology (i.e., restraint, shape concern, weight concern, global) in AN with more frequent weighing. In BN, mixed evidence emerged to sup-

port a relationship between more frequent weighing and higher shape concern, weight concern, and global score. In BED, higher restraint was found in those who weighed versus those who did not.

Discussion: Weighing frequency in each eating disorder (ED) sample was to some extent associated with greater ED severity, but not BMI. Future research should examine relationships between self-weighing, reactions to changing weighing frequency, and ED symptomatology in both ED and non-ED groups to understand the impact of self-weighing in heterogeneous populations. © 2016 Wiley Periodicals, Inc.

Keywords: self-weighing; weighing; anorexia nervosa; bulimia nervosa; binge eating disorder

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Introduction

Self-monitoring is a treatment component in eating disorders (EDs) and obesity.^{1,2} Controversy remains about appropriate frequency of self-weighing in both groups. On one hand, self-weighing is increasingly studied for weight loss, prevention of weight regain, and age-related weight gain.^{3–5} However, for some, self-weighing may be associated with negative psychological effects⁶; one nonclinical sample of women experienced

increases in anxiety and depression and a decrease in self-esteem attributable to daily weighing.⁷

Despite mixed evidence suggesting that frequent self-weighing could be psychologically harmful in non-ED populations,⁶ data are limited on self-weighing in individuals with EDs. In one study, <5% of inpatients reported self-weighing more than daily upon admission,⁸ but higher rates of self-weighing were observed in a sample of outpatients with EDs, with 57% endorsing self-weighing at least twice a

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day.⁹ The discrepancy between these studies may be due to differences in samples (i.e., inpatient vs. out-patient) and assessment measures. Because only these two studies have reported the frequency of self-weighing in ED populations and findings are inconsistent, further research is needed to clarify self-weighing frequency in a population at high risk for potentially adverse reactions.

Although self-weighing is gaining empirical support as a potentially effective weight control intervention, concerns about imposing weighing exist. Understanding the frequency of self-weighing in ED samples has the potential to establish groundwork for understanding if self-weighing is related to greater ED pathology. In evidence-based ED treatments, instructions for weighing are inconsistent, though weekly weighing is most often recommended.¹⁰ The primary objectives of this investigation were to: (1) examine the frequency of self-weighing and reaction to prescribed weekly weighing in individuals with symptoms of anorexia nervosa (AN), bulimia nervosa (BN), and binge eating disorder (BED); (2) examine differences in BMI and eating disorder psychopathology between self-weighing frequencies.¹¹

Methods

Participants

Data came from five samples. Sample 1 ($n = 137$): participants with either DSM-IV AN or eating disorder not otherwise specified (EDNOS), AN type, recruited to participate in a 2-week Ecological Momentary Assessment (EMA) study.¹² Sample 2 ($n = 93$): individuals meeting DSM-IV full/subthreshold criteria for BN recruited from community and clinical sites to participate in a psychotherapy treatment trial.¹³ Sample 3 ($n = 137$): females who met DSM-IV BN criteria recruited from the community for a 2-week EMA study.¹⁴ Sample 4 ($n = 133$): individuals meeting DSM-IV criteria for BN/EDNOS characterized by binge eating and purging and enrolled in a psychotherapy treatment trial.¹⁵ Sample 5 ($n = 258$): Overweight individuals with DSM-IV BED recruited for a psychotherapy treatment trial.¹⁶ Each study was approved by its sites' Institutional Review Board.

Measures

The Eating Disorder Examination (EDE) is a semi-structured interview assessing eating behaviors and cognitions that has demonstrated adequate validity and reliability.^{17,18} Recent versions include a question about self-weighing frequency in the past 28 days (this item will be referred to as "WEIGHING"). Participant's reaction to having a prescribed schedule of weekly weighing is assessed

TABLE 1. Descriptive characteristics of samples and presence of data (Total N = 758)

Sample	N ^a	Type of Sample	Primary Diagnosis	% Subthreshold or EDNOS	EDE version	WEIGHING ^b	REACTION ^c	BMI	% Female	% Caucasian	% Some College	Age	EDE Restraint	EDE Eating Concern	EDE Shape Concern	EDE Weight Concern	EDE Global
1	137	Community	AN	50%	12	X	X	17.1 ± 1.1	100	93.1	88.5	25.5 ± 8.5	2.7 ± 1.6	2.0 ± 1.4	3.0 ± 1.6	3.0 ± 1.6	2.7 ± 1.3
2	93	Treatment	BN	27.50%	16	X	X	23.6 ± 5.3	90.2	85.9	92.4	27.2 ± 9.2	2.9 ± 1.5	2.7 ± 1.4	4.0 ± 1.7	3.9 ± 1.2	3.4 ± 1.1
3	137	Community	BN	0%	14	X	X	23.9 ± 5.2	100	97.0	81.8	25.4 ± 7.6	3.1 ± 1.6	2.3 ± 1.4	3.8 ± 1.4	4.0 ± 1.4	3.3 ± 1.2
4 ^d	133	Community	BN	55.5%	12	missing	X	23.8 ± 5.1	98.3	95.8	79.7	29.0 ± 10.7	3.5 ± 1.3	1.9 ± 1.4	3.6 ± 1.4	3.4 ± 1.3	3.1 ± 1.1
5	258	Treatment	BED	0%	12	X	X	38.4 ± 7.9	87.2	96.1	83.0	46.7 ± 10.7	4.8 ± 1.6	1.9 ± 1.3	3.6 ± 1.0	3.4 ± 1.1	2.6 ± 0.9

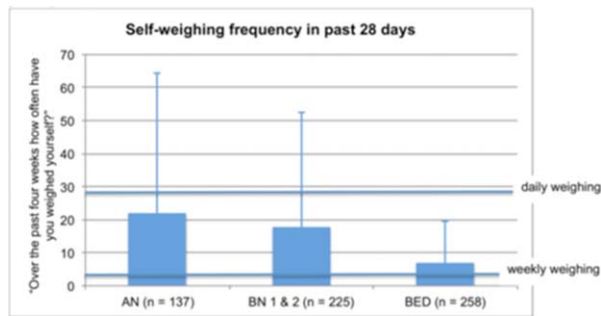
^aN accounts for the number of participants answering the WEIGHING or REACTION TO PRESCRIBED WEIGHING items of the EDE. If a different number of participants answered each item, N corresponds to the item where the most responses were available.

^bWEIGHING = The WEIGHING item in the EDE states "Over the past four weeks how often have you weighed yourself?"¹⁸

^cREACTION = The REACTION item asks "How would you feel if you were asked to weigh yourself once each week for the next 4 weeks?" in EDE v12¹⁹ and in v16, "Over the past four weeks how would you have felt if you had been asked to weigh yourself once each week for the subsequent four weeks . . . just once a week; no more often and no less often?"¹⁸

^dThis sample used the EDE v12 and had data on REACTION TO PRESCRIBED WEIGHING but not WEIGHING.

FIGURE 1. Self-weighing frequency by sample. Note: Bars are mean reported number of times individual self-weighed within the past 28 days as reported by the EDE. Whiskers are one standard deviation above the mean. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]



(REACTION TO PRESCRIBED WEIGHING, this item will be referred to as “REACTION”). Table 1 shows the EDE version used by sample and the presence or absence of the WEIGHING and REACTION items. Four out of five samples included WEIGHING, and all five samples included REACTION. The EDE, demographic data, height, and weight were collected at baseline.

The WEIGHING item states “Over the past four weeks how often have you weighed yourself?”¹⁸ WEIGHING does not contribute to EDE subscales or global score.

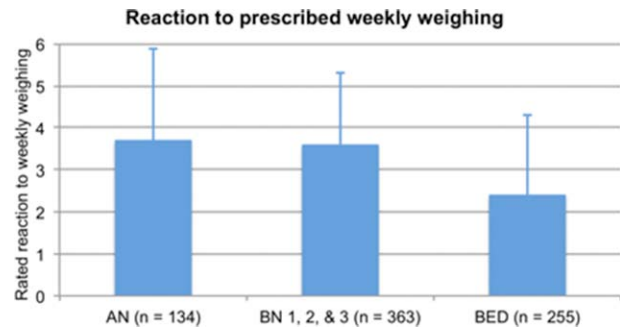
The REACTION item asks “How would you feel if you were asked to weigh yourself once each week for the next 4 weeks?” in EDE v12¹⁹ and in v16, “Over the past four weeks how would you have felt if you had been asked to weigh yourself once each week for the subsequent four weeks . . . just once a week; no more often and no less often?”¹⁸ Ratings range from 0 (no reaction) to 6 (marked reaction). REACTION contributes to the weight concern subscale. In sample 1, the inter-rater reliability for REACTION was relatively high (ICC = 0.883).

Data Analyses

Analyses were conducted using SPSS v20. Alpha = 0.05. Descriptive statistics were run for WEIGHING and REACTION; means and standard deviations describe self-weighing frequency. * Stratifying by sample, the Independent-Samples Kruskal-Wallis test was used to assess differences for BMI (height/weight²) and EDE subscales based on the following self-weighing categories: daily or greater, a few times per week, weekly or less, or none. Individuals avoiding weighing were removed from analyses. Pairwise post-hoc comparisons were made using the Mann-Whitney U.

*Reported frequency of self-weighing 700 times in 28 days in Sample 3, z scores = 10.2.

FIGURE 2. Reaction to prescribed weekly weighing by sample. Note: Bars are mean reaction to prescribed weekly weighing as reported by the EDE. 0—no reaction; 2—slight reaction; 4—moderate reaction (definite reaction, but manageable), 6—marked reaction (pronounced reaction which would affect other aspects of the participants’ life). Whiskers are one standard deviation above the mean. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]



Results

Objective 1: Frequency of Self-Weighing and Reaction to Weekly Weighing

Table 1 displays data availability and descriptive characteristics. The two BN samples with the WEIGHING item were combined for WEIGHING analyses because the difference between mean weighing frequency was not significant ($t = 0.03$; $df = 223$; $P = 0.97$). **Figure 1** shows means \pm standard deviation for reported self-weighing in the past 28 days: AN = 22.1 ± 42.3 ; BN = 17.8 ± 34.6 ; BED = 7.1 ± 12.5 . There was no significant difference between means for REACTION in the three BN samples ($F = 0.096$; $df = 362$; $P = 0.91$); these groups were combined for REACTION. Average reaction to prescribed weekly weighing was 3.6 ± 2.2 in the AN sample, indicating a moderately negative but manageable reaction. In the BN samples, reaction to prescribed weighing was 3.6 ± 1.7 , and in the BED sample, reaction to prescribed weighing was 2.4 ± 1.9 . **Figure 2** displays these descriptive statistics.

Objective 2: Comparisons by Weighing Frequency

Table 2 shows results comparing individuals who weighed daily or more, a few times per week, weekly or less, or not at all by sample.

In the AN sample, restraint was significantly higher in the daily or more group (3.6 ± 1.4) compared with the few times per week (2.3 ± 1.4) and none (2.4 ± 1.6 ; $P < 0.05$) groups, but not the weekly or less group. Shape concern, weight concern and global scores were significantly higher in the daily or more group compared with each other group ($P < 0.05$).

TABLE 2. Frequency of weighing by sample; Means \pm standard deviations for BMI and EDE subscales according to weighing frequency

Sample (n; primary diagnosis)	% avoid ^{a, b} (n)	% (n) Weighing daily or greater	% (n) a few times a week	% (n) weighing weekly or less	% not weighing	P values
1 (137; AN)	3.6 (5)	28.8 (38)	21.2 (28)	31 (23.5)	25.5 (35)	
BMI kg/m ² (n)		17.3 \pm 0.9 (n = 37)	16.8 \pm 1.3 (n = 27)	17.1 \pm 1.2 (n = 30)	17.2 \pm 1.1 (n = 35)	0.349
Restraint (n)		3.6* \pm 1.4 (n = 38)	2.3[†] \pm 1.4 (n = 28)	2.8*[‡] \pm 1.8 (n = 31)	2.4^{†,‡} \pm 1.6 (n = 35)	0.004
Eating concern (n)		2.4 \pm 1.2 (n = 38)	2.0 \pm 1.5 (n = 28)	1.9 \pm 1.5 (n = 31)	1.6 \pm 1.2 (n = 35)	0.056
Shape concern (n)		3.8* \pm 1.5 (n = 38)	2.5[†] \pm 1.7 (n = 28)	2.9[†] \pm 1.7 (n = 31)	2.8[†] \pm 1.3 (n = 35)	0.012
Weight concern (n)		4.1* \pm 1.4 (n = 38)	2.7[†] \pm 1.4 (n = 28)	2.5[†] \pm 1.7 (n = 31)	2.8[†] \pm 1.7 (n = 35)	<0.001
Global (n)		3.5* \pm 1.1 (n = 38)	2.4[†] \pm 1.3 (n = 28)	2.5[†] \pm 1.4 (n = 31)	2.4[†] \pm 1.2 (n = 35)	0.001
2 (91; BN)	5.5 (5)	26.7 (23)	29.1 (25)	23.3 (20)	20.9 (18)	
BMI kg/m ² (n)		22.8 \pm 2.8 (n = 21)	23.0 \pm 5.2 (n = 22)	25.0 \pm 5.8 (n = 18)	22.3 \pm 2.7 (n = 18)	0.324
Restraint (n)		3.2 \pm 1.4 (n = 23)	3.1 \pm 1.5 (n = 25)	2.8 \pm 1.5 (n = 20)	2.7 \pm 1.6 (n = 18)	0.642
Eating concern (n)		3.1 \pm 1.7 (n = 23)	3.1 \pm 1.3 (n = 25)	2.5 \pm 1.3 (n = 20)	2.2 \pm 1.2 (n = 18)	0.086
Shape concern (n)		4.1 \pm 1.0 (n = 23)	4.2 \pm 1.1 (n = 25)	4.2 \pm 1.0 (n = 20)	3.5 \pm 1.3 (n = 18)	0.295
Weight concern (n)		4.6* \pm 1.0 (n = 23)	3.8[†] \pm 0.8 (n = 25)	3.7[†] \pm 1.2 (n = 20)	3.3[†] \pm 1.5 (n = 18)	0.020
Global (n)		3.7 \pm 1.0 (n = 23)	3.5 \pm 1.0 (n = 25)	3.3 \pm 1.0 (n = 20)	2.9 \pm 1.2 (n = 18)	0.214
Sample (n; primary diagnosis)	% avoid ^{a, b} (n)	% (n) weighing daily or greater	% (n) a few times a week	% (n) weighing weekly or less	% not weighing	P values
3 (134; BN)	8.2 (11)	27.6 (34)	23.6 (29)	32.5 (40)	16.3 (20)	
BMI kg/m ² (n)		23.6 \pm 3.9 (n = 34)	23.6 \pm 5.1 (n = 29)	23.5 \pm 5.7 (n = 40)	24.9 \pm 6.7 (n = 20)	0.815
Restraint (n)		3.0 \pm 1.5 (n = 34)	3.7 \pm 1.4 (n = 29)	3.0 \pm 1.7 (n = 40)	2.3 \pm 1.6 (n = 20)	0.051
Eating concern (n)		3.1 \pm 1.7 (n = 34)	2.4 \pm 1.2 (n = 29)	1.9 \pm 1.3 (n = 40)	1.9 \pm 1.5 (n = 20)	0.144
Shape concern (n)		4.2* \pm 1.0 (n = 34)	4.1* \pm 1.2 (n = 29)	3.3[†] \pm 1.5 (n = 40)	3.3*[†] \pm 1.6 (n = 20)	0.034
Weight concern (n)		4.8* \pm 0.9 (n = 34)	4.3[†] \pm 1.1 (n = 29)	3.5[†] \pm 1.4 (n = 40)	3.5[†] \pm 1.8 (n = 20)	<0.001
Global (n)		3.6* \pm 0.8 (n = 34)	3.6* \pm 0.9 (n = 29)	2.9[†] \pm 1.2 (n = 40)	2.8[†] \pm 1.5 (n = 20)	0.015
5 (258; BED)	4.3 (11)	9.3 (23)	22.7 (56)	36.0 (89)	32.0 (79)	
BMI kg/m ² (n)		40.7 \pm 9.4 (n = 20)	40.3 \pm 8.7 (n = 51)	37.6 \pm 7.5 (n = 80)	36.9 \pm 6.7 (n = 71)	0.093
Restraint (n)		1.9* \pm 1.3 (n = 23)	1.8* \pm 1.3 (n = 56)	1.6* \pm 1.2 (n = 89)	1.3[†] \pm 1.4 (n = 79)	0.047
Eating concern (n)		1.8 \pm 1.1 (n = 23)	2.0 \pm 1.2 (n = 56)	2.1 \pm 1.3 (n = 89)	1.6 \pm 1.3 (n = 79)	0.054
Shape concern (n)		3.5 \pm 0.8 (n = 23)	3.6 \pm 1.2 (n = 56)	3.6 \pm 1.0 (n = 89)	3.5 \pm 1.1 (n = 79)	0.840
Weight concern (n)		3.7 \pm 0.9 (n = 23)	3.4 \pm 0.9 (n = 56)	3.3 \pm 1.0 (n = 89)	3.3 \pm 1.3 (n = 79)	0.322
Global (n)		2.7 \pm 0.7 (n = 23)	2.7 \pm 0.9 (n = 56)	2.7 \pm 0.8 (n = 89)	2.5 \pm 1.0 (n = 79)	0.143

^aThe difference between % of participants avoiding weighing by sample was not statistically significant ($\chi^2 = 3.6$; $df = 3$; $P = 0.31$).

^bThose who reported avoidance of weighing were excluded from analyses.

^c**Bolded** values indicate weighing groups are significantly different at $P < 0.05$ as indicated by an Independent-Samples Kruskal-Wallis test.

*,[†],[‡] different symbols indicate a significant difference between groups at $P < 0.05$ as indicated by an Independent-Samples Mann-Whitney U test.

In both BN samples, weight concern was significantly higher in those weighing daily or more (Sample 2 = 4.6 ± 1.0 ; Sample 3 = 4.8 ± 0.9) compared with each other group (Sample 2 means range 3.3–3.8; Sample 3 means range 3.5–4.3).

In the BED sample, restraint was significantly higher in all groups that weighed daily or more (1.9 ± 1.3), a few times per week (1.8 ± 1.3), or weekly or less 1.6 ± 1.2 compared with the group that did not weigh (1.3 ± 1.4).

No statistically significant BMI differences were found between weighing groups for any sample.

Discussion

Self-weighing was most frequent among individuals with AN, followed by those with BN and BED. No sample weighed daily on average, but the mean for all samples weighed was greater than weekly. ED participants exhibited a moderately negative reac-

tion to being directed to weigh weekly. In comparing BMI and EDE subscales between those weighing daily or more, a few times a week, weekly or less, or not at all, BMI was not significantly different in any sample. Restraint was higher in those who weighed more frequently in AN and BED. Additionally, those weighing more frequently in the AN group exhibited greater shape concern, weight concern, and global scores. A relationship was evident in BN between greater weighing and weight concern.

Although weekly weighing is often advised in ED treatments (e.g. CBT-Enhanced),¹⁰ data are limited on frequency of self-weighing prior to treatment and psychological correlates of frequent self-weighing. Findings from the present study indicate that individuals with EDs report greater than weekly self-weighing regardless of diagnosis and that the weekly self-weighing that is recommended in most treatments would prompt a moderately negative reaction.

Limitations of this study include the number of statistical comparisons and heterogeneity of the samples. Samples differed on a number of characteristics; thus, comparisons between ED diagnoses were not made due to potential confounding factors. The small number of participants reporting avoidance of weighing did not allow for comparisons between those who never weigh but do not mind being weighed and those who actively avoid weighing. Others have noted that self-weighing is the most commonly avoided checking behavior.^{9,20} The cross sectional nature of these data does not allow for causal inference; the directionality of the relationship between self-weighing and ED psychopathology remains unclear. However, descriptive data presented here lay the groundwork for future work in this area. Future studies may provide insight into the role of self-weighing within ED symptomatology by comparing individuals who do not weigh with those who avoid self-weighing.

There is evidence that self-weighing is an effective strategy for adult weight management.^{1,3,4} Although some research has investigated potential harmful correlates of weighing, those with EDs have largely been ignored. Results from this study suggest that greater baseline weighing frequency is associated with increased ED psychopathology and this may differ by diagnostic category. Future work is needed to determine the role of self-weighing in EDs and whether weighing is a contributor to adverse outcomes, a symptom of pathology, or both.

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