

# Shape and Weight Concerns in Middle-Aged Women and the Relationship with Negative Affect and Education

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## Keywords

Shape concern · Weight concern · Depressiveness · Anxiety · Compulsiveness · Education

## Summary

**Background:** The relationship between negative affect, education, and shape and weight concerns has been well researched for young women. However, barely any studies have examined the respective factors in middle-aged women. The aim of this study was to examine whether there is a relationship between depressiveness, anxiety, compulsiveness, and shape and weight concerns in middle-aged women. Moreover, the role of level of education was investigated. **Methods:** In the framework of an online investigation into the eating behavior of women aged 40 years and over, besides socioeconomic variables, we measured the shape and weight concerns of the participants using a validated German version of the 'Eating Disorder Examination Questionnaire' (EDE-Q). Additionally, a German version of the 'Brief Symptom Inventory' (BSI) was employed. The results of 550 women aged between 40 and 65 years were included in the data analysis. **Results:** Depressiveness, anxiety and compulsiveness correlate positively with shape and weight concerns. The relationship between depressiveness and shape and weight concerns was stronger in women with a lower educational level. According to linear regression models, depressiveness and compulsiveness were the strongest predictors of shape and weight concerns for both educational levels. **Discussion:** Although the study examined healthy women in middle age, the observed relationship between negative affect, shape and weight concerns, and educational level could nevertheless be used in the prevention or early indication of eating disorders.

## Schlüsselwörter

Figurbezogene Sorgen · Gewichtsbezogene Sorgen · Depressivität · Ängstlichkeit · Zwanghaftigkeit · Bildung

## Zusammenfassung

**Hintergrund:** Der Zusammenhang zwischen negativer Affektivität, Bildung und den figur- und gewichtsbezogenen Sorgen ist für junge Frauen weitgehend erforscht. Hingegen gibt es kaum Studien, welche die entsprechenden Faktoren bei Frauen im mittleren Lebensalter untersuchen. Ziel dieser Studie war es zu prüfen, ob es einen Zusammenhang zwischen Depressivität, Ängstlichkeit, zwanghaftem Verhalten und den figur- und gewichtsbezogenen Sorgen bei Frauen im mittleren Lebensalter gibt. Zudem wurde die Rolle des Bildungsniveaus untersucht. **Methoden:** Im Rahmen einer Online-Untersuchung zum Essverhalten bei Frauen über 40 Jahren wurden, neben sozioökonomischen Variablen, die figur- und gewichtsbezogenen Sorgen der Teilnehmerinnen mittels einer validierten deutschen Version des «Eating Disorder Examination Questionnaire» (EDE-Q) erfasst. Zusätzlich wurde eine deutsche Version des «Brief Symptom Inventory» (BSI) eingesetzt. In die Datenanalyse wurden die Ergebnisse von 550 Frauen im Alter von 40–65 Jahren einbezogen. **Ergebnisse:** Depressivität, Ängstlichkeit und Zwanghaftigkeit korrelieren positiv mit figur- und gewichtsbezogenen Sorgen. Bei Frauen mit einem niedrigeren Bildungsniveau war der Zusammenhang zwischen Depressivität und figur- und gewichtsbezogenen Sorgen höher als bei Frauen mit einem höheren Bildungsniveau. Berechnungen anhand linearer Regressionsanalysen zeigten, dass Depressivität und Zwanghaftigkeit die stärksten Prädiktoren für figur- und essensbezogene Sorgen für beide Bildungsgruppen waren. **Diskussion:** Wenngleich die Ergebnisse dieser Studie bei gesunden Frauen im mittleren Lebensalter erhoben wurden, gibt der beobachtete Zusammenhang zwischen negativer Affektivität, figur- und gewichtsbezogenen Sorgen und Bildung Hinweise auf eine Frühindikation bzw. Prävention von Essstörungen.

## Background

Eating disorders are a subject that has been of great interest to the public and scientists for years, yet efforts to understand these disorders have so far mostly pertained to young women [APA, 2000]. The eating behavior of women in middle age, i.e., between ages 40 and 65 [Augustus-Horvath and Tylka, 2011; Simon et al., 2008], has so far barely been studied [Procopio et al., 2006]. Nevertheless, even in old age, eating disorders can have a severe impact [Cumella and Kally, 2008a,b].

Psychological factors, such as overemphasis of shape and weight affect eating behavior, form the core of most eating disorders, and have proved to be independent of body mass index (BMI) and age [Hrabosky and Grilo, 2007; Hrabosky et al., 2007; Fairburn and Harrison, 2003]. In young women, the following factors can reinforce a disturbed body image: negative affects, such as excessive stress, anxiety, feelings of shame, helplessness and inadequacy, and depressiveness [Stice et al., 2010; Ricciardelli and McCabe, 2004; Taylor and Cooper, 1992; McCarthy, 1990; Watson et al., 1988]. According to Bromberger and Lanza di Scalea [2009], it can be assumed that a negative affective state influences the eating behavior of middle-aged women just as it does that of young women. Initial studies show a relationship between negative affect and greater body dissatisfaction among middle-aged women [Dunkley et al, 2010; Hrabosky and Grilo, 2007; Midlarsky and Nitzburg, 2008]. This relationship is also found in women of this age group who have a diagnosed eating disorder [Midlarsky and Nitzburg, 2008; Cumella and Kally, 2008a,b; Forman and Davis, 2005].

One aspect of negative affect is heightened anxiety. This factor appears to be a predictor, along with depressiveness, of disordered eating behavior in both young and older women [Marcus et al, 2007; Procopio et al., 2006]. A further aspect of negative affect is a tendency towards compulsiveness. Numerous studies in young women have shown a relationship between obsessive-compulsive disorders (OCD) and eating disorders [Hsu et al., 1993; Polivy and Herman, 2002; Sansone and Sansone, 2010]. It is less certain whether this association between compulsiveness and pathological eating behavior also holds for middle-aged women. Rogers and Petrie [2001] demonstrated an association between obsessive-compulsive behavior and bulimic symptoms in middle-aged women. Both obsessive-compulsive behavior and negative affect are constructs in which worry cognitions are predominant [Gotlib and Joormann, 2010]. As an overevaluation of shape and weight is associated with eating disorders [Legenbauer et al., 2007], it is likely that these cognitions are associated with negative affect in middle age.

Socio-economic variables are repeatedly discussed in relation to mental disorders. To what extent the relationship between eating behavior and negative affect can be influenced by a higher or lower level of education has not yet been investigated. According to a study by Ahrén-Moonga et al. [2009],

young women with a higher educational level have a higher risk of developing disordered eating behavior than young women with a lower educational level. Maxwell et al. [2011] were unable to confirm this finding, however; they found that women with disordered eating behavior showed a trend toward a lower educational level than women with normal eating behavior.

Several studies have shown that higher prevalence rates of depressive disorders, which not infrequently occur in comorbidity with eating disorders, are associated with lower socioeconomic status [Everson et al., 2002]. Bjelland et al. [2008] showed that a higher level of education can be a protective factor against the development of depression throughout the lifespan.

In summary, it can be stated that the impact of negative affect on shape and weight concerns in middle-aged women has scarcely been explored. Findings regarding the relationship between education and eating disorders are not clear-cut. Negative affect and especially depressiveness appear to be associated with a lower educational level. It is likewise unclear whether the 3 constructs of shape and weight concerns, negative affect, and educational level are related among middle-aged women – and, if so, how. We therefore used an online survey to assess the extent of shape and weight concerns, negative affect, and socioeconomic characteristics of a large sample of women aged 40 and over. Based on this data set, the following hypotheses were tested: 1. Negative affect (especially depressiveness), anxiety, and compulsiveness are positively associated with shape and weight concerns. 2. The relationship between negative affect (especially depressiveness), anxiety, and compulsiveness on the one hand, and shape and weight concerns on the other, is stronger in women with a lower educational level. 3. The strongest predictor of negative affect for shape and weight concerns is depressiveness in women with a lower educational level.

## Methods

### Sample

The participants of the online survey were contacted through e-mail circulars and various advertisements on several websites of women's organizations (including [www.frauenlandsgemeinde.ch](http://www.frauenlandsgemeinde.ch)). Any interested woman aged 40 and over could participate in the study. The characteristics of the sample of participants whose data were analyzed are presented in table 1.

A total of 1,101 women accessed the survey's web page. Of these, 445 participants did not complete the questionnaire. 113 participants were not considered in the data analysis for the following reasons: current pregnancy ( $n = 4$ ), younger than 40 years ( $n = 7$ ), older than 65 years ( $n = 14$ ), incomplete responses to some questions ( $n = 35$ ), current affective disorders, anxiety disorders, eating disorders, or personality disorders according to information provided by the participant herself ( $n = 12$ ), giving the answer 'other' to the question regarding educational status ( $n = 16$ ). The data analysis was performed on the remaining sample of  $n = 550$ . The total sample was divided into 2 sub-samples. 236 participants reported that they had either a secondary general school, vocational school, or baccalaureate diploma, and were allocated to the 'secondary education'

**Table 1.** Sample description

	Secondary education (n = 236)	Tertiary education (N = 314)	Group differences t test/Chi <sup>2</sup>
Age, years	M = 50.86; SD = 6.17	M = 49.40; SD = 5.93	T = 2.81; p = 0.005
BMI, kg/m <sup>2</sup>	M = 24.23; SD = 4.67	M = 22.96; SD = 3.65	T = 3.56; p = 0.001
Relationship status			
Married/in a relationship/ single/separated/divorced	N = 196 (83.1%) N = 40 (16.9%)	N = 239 (76.1%) N = 75 (23.9%)	$\chi^2 = 6.92$ ; p = 0.074
Employment status			
76–100%	N = 77 (32.6%)	N = 164 (52.2%)	
Not employed/up to 75%	N = 159 (67.4%)	N = 150 (47.8%)	$\chi^2 = 38.86$ ; p = < 0.001
EDE-Q <sub>shape</sub>	M = 1.86; SD = 1.62	M = 1.51; SD = 1.31	T = 2.77; p = 0.006
EDE-Q <sub>weight</sub>	M = 1.44; SD = 1.44	M = 1.18; SD = 1.55	T = 2.34; p = 0.020
BSI <sub>depression</sub>	M = 1.91; SD = 2.93	M = 1.69; SD = 2.34	T = 1.22; p = 0.222
BSI <sub>anxiety</sub>	M = 1.91; SD = 2.43	M = 1.68; SD = 2.01	T = 1.14; p = 0.257
BSI <sub>obsessive-compulsive</sub>	M = 3.14; SD = 2.99	M = 2.91; SD = 2.46	T = 0.98; p = 0.324
M = mean; SD = standard deviation; EDE-Q <sub>shape</sub> = subscale 'shape concerns' of the EDE-Q; EDE-Q <sub>weight</sub> subscale = 'weight concerns' of the EDE-Q; BSI <sub>depression</sub> = subscale 'depression' of the BSI; BSI <sub>anxiety</sub> = subscale 'anxiety' of the BSI; BSI <sub>obsessive-compulsive</sub> = subscale 'obsessive-compulsive' of the BSI; secondary education = vocational training as the highest educational achievement; tertiary education = college or university as the highest educational achievement.			

group. 314 participants selected the answers technical university, college degree, or doctorate and were thus classified into the 'tertiary education' group. This division corresponds to the Swiss educational system, which is organized into preschool, primary, secondary I, secondary II, tertiary, and stage four, as well as medical and special education. Primary school and secondary I are compulsory. Secondary education includes vocational training (e.g., apprenticeship) and general education courses (e.g., academic high school). The tertiary level includes higher vocational education and colleges or universities.

#### Method

The subjects received an e-mail with the link to the web page of the online survey on 'Unipark' ([www.unipark.info/1-0-home.htm](http://www.unipark.info/1-0-home.htm)). On the web page, the potential participants were first of all provided with information about the study. They then provided their consent to the terms of participation. Next, sociodemographic information was collected, such as age, BMI, relationship status, employment status, and educational status, followed by, in randomized order, the eating disorder questionnaire (EDE-Q, see below), and the brief symptom inventory (BSI, see below). It took approximately 15 min to answer all of the questions. The study was performed in accordance with the Declaration of Helsinki.

#### Negative Affect

Negative affect was assessed using the German version of the BSI [Derogatis, 1993; Franke, 2000]. The BSI comprises 53 items and is an instrument for assessing the impairment of subjective well-being due to physical and psychological symptoms. The inventory consists of 9 subscales: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. 3 global values also provide information about the response to all of the questions on the BSI. Each question in this instrument can be answered on a 5-point Likert scale. To answer the questions of this study, only the subscales for depression, anxiety, and obsessive-compulsive were used. Cronbach's alpha for these scales was acceptable (BSI<sub>depression</sub> = 0.827; BSI<sub>anxiety</sub> = 0.712; BSI<sub>obsessive-compulsive</sub> = 0.742).

#### Shape and Weight Concerns

Shape and weight concerns were recorded using the German version of the EDE-Q [Fairburn and Beglin, 1994; Hilbert et al., 2007]. The EDE-Q is a survey instrument with 36 items, with questions referring to eating behavior over the past 28 days. The questionnaire contains 4 subscales, which depict the extent of dietary restraint and concerns about eating, weight, and shape. The subscales 'restrained eating behavior' and 'eating concerns' are used to assess behavioral aspects of disordered eating behavior. Additionally, a total score can be generated from all of the subscales. All items are answered on a 7-point Likert scale, with higher scores representing more severe eating problems. The frequency of weight-reducing measures, such as vomiting, is also assessed. Cronbach's alpha for the subscales investigated was acceptable (EDE-Q<sub>weight</sub> = 0.77; EDE-Q<sub>shape</sub> = 0.89).

#### Data Analysis

To check for associations between negative affect and shape and weight concerns, bivariate correlations depending on level of education were calculated. We also checked whether the strength of the correlations differed significantly from each other. Finally, for the 2 education groups and the variables of shape and weight concerns, we performed a stepwise multiple regression analysis in order to determine the best predictor of the respective dependent variable.

## Results

### The Relationship Between Negative Affect and Shape and Weight Concerns

The correlations between depressiveness, anxiety, and compulsiveness on the one hand, and shape and weight concerns on the other, were all positively significant. The correlations that were determined separately for the groups with secondary or tertiary education showed the same result. Table 2

**Table 2.** Correlation matrix of all variables

	1	2	3	4	5	M	SD	Range
<b>Secondary education</b>								
1 EDE-Q <sub>shape</sub>						1.85	1.61	0–6
2 EDE-Q <sub>weight</sub>	0.92					1.44	1.43	0–6
3 BSI <sub>depression</sub>	0.48	0.48				1.91	2.92	0–18
4 BSI <sub>anxiety</sub>	0.34	0.34	0.55			1.91	2.42	0–18
5 BSI <sub>obsessive-compulsive</sub>	0.44	0.41	0.61	0.61		3.14	2.99	0–18
<b>Tertiary education</b>								
1 EDE-Q <sub>shape</sub>						1.51	1.31	0–5.25
2 EDE-Q <sub>weight</sub>	0.90					1.18	1.15	0–5.50
3 BSI <sub>depression</sub>	0.32	0.25				1.63	2.35	0–14
4 BSI <sub>anxiety</sub>	0.28	0.19	0.54			1.68	2.01	0–13
5 BSI <sub>obsessive-compulsive</sub>	0.35	0.28	0.54	0.59		2.91	2.46	0–13

Unless otherwise indicated, all coefficients were significant at the level of  $P = 0.001$ .

M = mean; SD = standard deviation; EDE-Q<sub>shape</sub> = subscale ‘shape concerns’ of the EDE-Q; EDE-Q<sub>weight</sub> subscale = ‘weight concerns’ of the EDE-Q; BSI<sub>depressiveness</sub> = subscale ‘depression’ of the BSI; BSI<sub>anxiety</sub> = subscale ‘anxiety’ of the BSI; BSI<sub>obsessive-compulsive</sub> = subscale ‘obsessive-compulsive’ of the BSI; secondary education = vocational training as the highest educational achievement; tertiary education = college or university as the highest educational achievement.

shows the correlation matrix of all of the variables. The correlation differences between depressiveness and shape concerns are significant between the group with secondary education and that with tertiary education ( $Z = 2.21$ ;  $p = 0.027$ ). Similarly, the correlations between depressiveness and weight concerns in the 2 groups differ significantly ( $Z = 3.09$ ;  $p = 0.002$ ). The correlations between anxiety and shape concerns shows no significant differences ( $Z = 0.076$ ;  $p = 0.0443$ ). The correlations also do not differ between anxiety and weight concerns in the 2 groups ( $Z = 1.86$ ;  $p = 0.062$ ). Finally, no significant difference was detected between the correlations of compulsiveness and shape concerns ( $Z = 1.232$ ;  $p = 0.218$ ), or compulsiveness and weight concerns between the 2 levels of education ( $Z = 1.71$ ;  $p = 0.088$ ).

#### *Predictors of Shape and Weight Concerns*

The independent variables of depressiveness, anxiety, and compulsiveness were tested as predictors in a stepwise multiple regression model for each educational group. We found the following results for the group of women with a secondary education: The stepwise multiple regression analysis with the independent variables depressiveness, anxiety, and compulsiveness, and the dependent variable weight concerns showed that the 3 variables together accounted for a total of 25.5% of the variance, with depressiveness being the best predictor. The stepwise multiple regression analysis with the dependent variable shape concerns showed that the above-mentioned independent variables accounted for 25.6% of the variance, with depressiveness and compulsiveness proving to be the best predictors.

The evaluation of the group with a tertiary education provided the following results: The independent variables explained a total of 9.4% of the dependent variable weight concerns, with depressiveness and compulsiveness being the best predictors. The explained variance for shape concerns amounted to a total of 15.0%, and depressiveness and compulsiveness were again the best predictors. The results of the multiple regression analyses are presented in table 3.

Data on collinearity diagnosis were gathered for all linear regression models. The collinearity statistics of the linear regression analysis with the predictors depressiveness, compulsiveness, and anxiety, and the dependent variable shape concerns had Variance Inflation Factor (VIF) values of 2.031–2.253. The collinearity statistics of the linear regression analysis for the predictors of depressiveness, compulsiveness, and anxiety, and the dependent variable weight concerns show comparable VIF values. Since the VIF values do not exceed the critical level of 10, it can be assumed that there is no multicollinearity.

## **Discussion**

The results of our survey show that depressiveness, anxiety, and compulsiveness in middle-aged women are significantly associated with shape and weight concerns. The relationship between depressiveness and shape and weight concerns, however, is more common among women with a lower level of education than among those with a higher level. Furthermore, it was apparent that of all of the dimensions of negative affect we studied, the extent of depressiveness and compulsiveness are the strongest predictors of shape and weight concerns, independent of educational level.

**Table 3.** Regression analysis data concerning the influence of negative affect on shape and weight concerns

	R	R2	B	$\beta$	p
EDE-Q <sub>shape</sub>					
Secondary education					
BSI <sub>depression</sub>	0.233	0.230	0.187	0.339	0.000 <sup>c</sup>
BSI <sub>anxiety</sub>	0.241	0.235	0.014	0.021	0.779
BSI <sub>obsessive-compulsive</sub>	0.266	0.256	0.117	0.217	0.006 <sup>b</sup>
Tertiary education					
BSI <sub>depression</sub>	0.318	0.101	0.089	0.160	0.016 <sup>a</sup>
BSI <sub>anxiety</sub>	0.342	0.117	0.032	0.049	0.474
BSI <sub>obsessive-compulsive</sub>	0.387	0.150	0.126	0.239	0.001 <sup>b</sup>
EDE-Q <sub>weight</sub>					
Secondary education					
BSI <sub>depression</sub>	0.486	0.236	0.181	0.369	0 <sup>c</sup>
BSI <sub>anxiety</sub>	0.494	0.244	0.029	0.048	0.519
BSI <sub>obsessive-compulsive</sub>	0.505	0.255	0.071	0.148	0.061
Tertiary education					
BSI <sub>depression</sub>	0.252	0.064	0.071	0.144	0.036 <sup>a</sup>
BSI <sub>anxiety</sub>	0.260	0.068	-0.009	-0.016	0.821
BSI <sub>obsessive-compulsive</sub>	0.307	0.094	0.100	0.214	0.003 <sup>b</sup>
R = correlation coefficient R2 = coefficient of determination; B = regression coefficient; $\beta$ = standardized regression coefficient EDE-Q <sub>shape</sub> = subscale 'shape concerns' of the EDE-Q; secondary education = vocational training as the highest educational achievement; BSI <sub>depression</sub> = subscale 'depressiveness' of the BSI; BSI <sub>anxiety</sub> = subscale 'anxiety' of the BSI; BSI <sub>obsessive-compulsive</sub> = subscale 'obsessive-compulsive' of the BSI; tertiary education = college or university as the highest educational achievement; EDE-Q <sub>weight</sub> subscale = 'weight concerns' of the EDE-Q <sup>a</sup> p <0,05; <sup>b</sup> p <0,01; <sup>c</sup> p <0,001.					

The results suggest that negative affect not only influences young women's disordered eating behavior [Stice et al., 2010; McCarthy, 1990; Taylor and Cooper, 1992], but that this relationship also holds for middle-aged women. Due to the cross-sectional nature of the present study, however, the causal relationship between negative affect, body dissatisfaction, and disordered eating behavior could not be clarified.

This study further showed that the relationship between depressiveness and shape and weight concerns is more pronounced in women with a lower level of education than in women with a higher level. This finding is consistent with the literature, which establishes an association between depressiveness and lower educational levels [Chazelle et al., 2011].

Depressiveness and compulsiveness seem to be clear predictors of shape and weight concerns in middle-aged women. Studies have repeatedly shown a high comorbidity between affective disorders and eating disorders in women [Lewinsohn et al., 2000; Santos et al., 2007; Zaider et al., 2000]. In addition, a recent study showed that depressive disorders and bulimia nervosa exist in a reciprocal relationship [Presnell et al., 2009]. Our conclusion is in line with the findings reported in the previous literature. The results could be interpreted such that, in the treatment of abnormal to more disordered eating behavior, psychological problems should not be set

aside, but should also be treated [Bushnell et al., 1994; Sloan et al., 2005; Burton et al., 2007].

A similar interpretation also seems appropriate for the relationship between compulsiveness and abnormal eating behavior. OCD and disordered eating behavior show a similar pathogenesis – i.e., one disorder may be a risk factor for the development of the other [Shankman and Altman, 2009]. In this context, perfectionism has been described as a characteristic common to both groups of disorders, which might mediate the relationship between OCD and eating disorders [Wade et al., 2008]. As obsessive-compulsive behavior satisfies the desire for control [Shankman and Altman, 2009] and disordered eating behavior includes, among other things, the loss of control over eating [Legenbauer et al., 2007], it seems likely that these 2 constructs are closely intertwined.

Anxiety does not seem to be a main predictor of shape and weight concerns. One reason for this might be that depressive disorders and obsessive-compulsive illnesses are more frequently found to be comorbid with eating disorders than are anxiety disorders [APA, 2000].

In interpreting these results, the limitations of the current study should be taken into account. An online survey has several advantages, such as the possibility of reaching a large number of women, although not all of the women who ex-

press interest complete the questionnaire. In our study, the dropout rate was 45%. Our dropout rate is roughly comparable to that reported by Musch and Reips [2000] and Reips [2002] for online studies (approximately 35%). However, the following drawbacks to this approach should be considered: The generalization of our results to the total population of middle-aged women is limited, because our sample's interest in the topic could be particularly great in terms of participants' knowledge about the body, eating behavior, and even eating disorders. Furthermore, use of the internet is a prerequisite.

Finally, the women who took part in our study claimed to have good mental health. The mean values in the scales for shape and weight concerns correspond to a healthy, non-eating-disordered population [Hilbert and Tuschen-Caffier, 2006]. Thus, no general conclusions can be drawn about disordered eating behavior or eating disorders in this age group.

Rather, our study shows that shape and weight concerns in healthy middle-aged women are associated with negative affect, and also that this relationship is influenced by level of education. This and subsequent studies could therefore determine specific risk groups for disordered eating behavior. Awareness of risk groups could be useful in the early detection and/or prevention of eating disorders.

## Disclosure Statement

The authors have no financial or professional obligations that could result in a conflict of interest.

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