

# Relationship between sociocultural attitudes toward appearance and depression among patients with obesity

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## Research article

**Keywords:** obesity, depression, body image, media, sociocultural attitudes towards appearance, structural equation modeling

**Posted Date:** August 19th, 2020

**DOI:** <https://doi.org/10.21203/rs.3.rs-51854/v1>

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# Abstract

**Background:** Obesity is a significant risk factor for mental health. Depression and obesity appear to have a bi-directional relationship in which a number of mediating factors may play a role, such as body dissatisfaction. Unrealistic messages related to image may contribute to depression in individuals with excess weight through body image dissatisfaction. The aim of the present study was to investigate the role of appearance-related sociocultural attitudes in the development of two common comorbid psychological characteristics of obesity, namely, body image dissatisfaction and depression.

**Methods:** The sample of the cross-sectional survey consisted of participants in an inpatient weight loss treatment ( $n = 339$ , 19% men). The mean age was 50.2 (SD = 13.47) years, the mean BMI was 38.6 (SD = 7.58) kg/m<sup>2</sup>. Measures: self-reported anthropometric data, Sociocultural Attitudes Towards Appearance Questionnaire-3, Body Shape Questionnaire – Short form 14, CES-D Depression Scale.

**Results:** Results of path analysis revealed many weak but significant indirect paths between appearance-related sociocultural attitudes and depression through body image dissatisfaction ( $\chi^2 = 688.23$ ,  $df = 35$ ,  $p < .001$ ; CFI = .995; TLI = .973; RMSEA = .039, 90% CI: .00 – .08; SRMR = .013). The model explains 31.8% of the variance of body dissatisfaction and 23.3% of the variance of depressive symptoms.

**Conclusions:** Assessing the extent and causes of body image dissatisfaction and depression, and striving to reduce them can be a valuable addition of weight loss programs.

## Background

Overweight and obesity are a serious burden on both the individual and society, endangering health and increasing the risk of mortality, which has reached epidemic proportions in developed countries and affects around 46% of the world's population over the age of 19 (1). According to the results of the 2014 Hungarian Diet and Nutritional Status Survey, almost two-thirds of adults are overweight and 28.2% of men and 31.5% of women are obese (2). The economic burden of treating comorbidities in obesity is significant (3, 4).

Obesity is a threat on both physical and mental health. In the case of the latter, the comorbidity of obesity with depression should be highlighted. A meta-analysis of longitudinal studies in adult population (5) found that baseline depression increased the risk of developing obesity (BMI  $\geq 30$ ) by 37% (RR = 1.37; 95% CI: 1.17–1.48). The absolute risk is 2% (RD = 0.02; 95% CI: 0.01–0.03). The strength of the association proved to be similar in both sexes.

Depression is a particularly unfortunate comorbid condition of obesity because it is characterized by decreased physical activity or an atypical form that predisposes individuals to emotional eating (6). All this contributes to weight gain and the stabilization of excess weight. Negative affectivity can also be a barrier to seeking weight loss treatment (7). At the same time, improved mental well-being may contribute to the emergence of behavioral changes for weight control and the success of weight loss (8).

Depression and obesity appear to have a bi-directional relationship, i.e., obesity increases the risk of developing depression, whereas the presence of depression increases the risk of developing obesity (5, 9). The bi-directional relationship between obesity and depression can be mediated by a number of factors, such as biological, psychological, behavioral, and social mechanisms (10, 11). Exploring the mediators of the relationship between obesity and depression helps to understand the relationship and optimize interventions.

Appearance-related media messages may contribute to depression in individuals with excess weight. Exposure to unrealistic media images and messages has been identified as a risk factor for body image dissatisfaction, eating disturbances, and mental health concerns (12). The dissatisfaction with the body, which is now considered almost normative not only among women but also among men (13), is due to the fact that under the auspices of the ideal of slim and sporty physique, obesity is extremely unfavorable and stigmatization of obesity and negative discrimination against overweight people are palpable in many areas of life even in health care system (14, 15). Body image dissatisfaction is one of the most consistent psychological consequences of obesity (16), where complex causal background sociocultural explanatory theories stand out. The social exchange value of an ideal, healthy body is very high, and many industries support efforts to achieve this. Expectations of desirable forms of appearance are largely mediated by the media and everyone is voluntarily or unintentionally exposed to this. Failure to meeting perceived societal ideals resulted in a higher body image dissatisfaction; therefore overweight and obesity are associated with increased risk for depressive symptoms (12).

Since body image dissatisfaction plays a mediating role in the relationship between excess weight and depression (10, 17, 18) and may be an obstacle to the effectiveness of cognitive-behavioral weight loss programs (19), examining the role of appearance related media messages in the relationship between BMI and depression can be of great significance.

Sociocultural explanatory theory of eating and body image disorders has often been tested using structural equation modeling (e.g., (20–22)). The use of complex, multivariate models is beneficial because it can contribute to a deeper understanding of the problem area. Highlighting some examples, a study of a sample of college women ( $n = 219$ ) Fitzsimmons-Craft et al. (20) found that the relationship between media pressure to achieve thinness and body image dissatisfaction is mediated by the internalization of the thin body ideal, while social comparison has been identified as an explanatory link in the relationship between the internalization of the thin ideal and body dissatisfaction. In a sample of young adults ( $n = 743$ ) Jeffers et al. (12) found a direct effect of BMI on media pressure, a direct effect of media pressure on depressive symptoms, and an indirect effect of BMI on depressive symptoms mediated by media pressures. Their findings indicate that higher BMI levels are associated with greater depressive symptoms when there is greater perceived media pressure on body image.

Nevertheless, studies on the subject have focused primarily on adolescents and young adults. Such studies are not available for the overweight elderly population. As older age, obesity, and depression are

all risk factors for many chronic diseases (23, 24), it is worthwhile including this segment of population in research examining the association between appearance-related sociocultural effects and mental health.

The aim of the present study was to investigate the role of appearance-related sociocultural attitudes in the development of two common comorbid psychological characteristics of obesity, namely, body image dissatisfaction and depression. In the theoretical model (Fig. 1.), we hypothesized that the subjective importance of media messages for a socioculturally defined body ideal results in greater perceived pressure to achieve these ideals. Increased perceived pressure through internalization of the body ideal leads to dissatisfaction with the body and thus to depression. In the relationship between BMI and depression, we also hypothesized an indirect pathway from pressure through internalization and physical dissatisfaction. During the path analysis gender, age, and education were adjusted.

## Methods

### Participants

We conducted a cross-sectional, questionnaire-based survey. The sample consisted of patients who participated in the inpatient weight loss treatment in the Lipidological Department of Szent Imre Hospital in Budapest, Hungary. This treatment consists of several components: complete internal medical examination and setting up treatment for abnormalities found; very low calorie diet (600–800 Kcal), exercise therapy, education by a dietitian to develop a long-term diet of 1200–1500 Kcal (25).

An a priori power analysis was conducted using G\*Power3.1 (26) using a two-tailed multiple linear regression analysis (fixed model) with 8 predictors, a medium effect size ( $f^2 = .15$ ), and an alpha of .05. Result showed that a total sample of 160 participants was required to achieve a power of .95.

The study involved 339 patients (19% [ $n = 66$ ] men). The mean age was 50.2 (SD = 13.47, range 18–85) years. Almost half of the participants (47.0%) lived in the capital. Educational level was elementary in 15%, secondary school in 42%, and university or college degree in 43% of the respondents. The mean BMI was 38.6 (SD = 7.58, range 25.1–79.3)  $\text{kg}/\text{m}^2$ . Eighty-nine percent of the participants were obese (BMI  $\geq 30.0 \text{ kg}/\text{m}^2$ ). The procedure is described in detail elsewhere (27).

### Measurement instrument

*Demographics.* The survey assessed the following demographic and anthropometric variables: age, education, place of residence, height (cm) and weight (kg). BMI was calculated using self-reported height and weight.

*Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ-3)* (28). This questionnaire assesses various sociocultural influences delivered by the media with a possible influence on body image and eating disorders. The 30-item self-report questionnaire consists of four subscales: Internalization-General, Internalization-Athlete, Pressures and Information. Items are rated on a five-point Likert-type scale from

definitely disagree (1) to definitely agree (5). The Internalization-General subscale assesses involvement and acceptance of media messages supporting the present unrealistic thin-ideals. The Internalization-Athlete subscale assesses the acceptance and internalization of an athletic body ideal. The Pressures subscale assesses the individual's rating of perceived pressures to attain the cultural ideals of physical appearance portrayed by the media and how much a person engages in potentially health-risk behaviours (e.g., dieting, exercise) to change one's physical appearance. The Information subscale measures the importance of various forms of media (television, magazines, and movies) in acquiring information about attractiveness. The higher scores on the subscales indicate a higher internalization, greater perceived pressure from the media regarding appearance and higher subjective importance of media messages. The Hungarian version of the questionnaire's internal consistency was satisfactory in a high school and university female sample. However, based on the results of the exploratory factor analysis, some items of the Internalization-Athlete subscale showed significant overlapping with the Internalization-General subscale (29).

*Body Shape Questionnaire – Short form* (BSQ–SF14) (30). This short, fourteen-item scale measures psychopathological concern about body shape. Questions relate to the respondent's state over the past two weeks and are answered on a six-point Likert scale (1 = never to 6 = always). Higher scores on the BSQ–SF14 indicate more body weight concern and greater body weight dissatisfaction. A study of the psychometric properties of the Hungarian version has confirmed its reliability and validity (31).

*Center for Epidemiologic Studies Depression Scale* (CES-D) (32). This 20-item scale assesses the frequency of depressive symptoms, used primarily in the general population. Respondents should rate, how often they were characterized by the certain cognitive, affective, conative and interpersonal symptoms of depression during the last week. Higher scores on the CES-D indicate increased level of depression. The internal consistency of the Hungarian version of the questionnaire proved to be acceptable (33). In this study Cronbach's alpha coefficients were acceptable for all measures and are reported in Table 1.

## **Statistical analyses**

Missing data were replaced by participants' own scale averages. Up to two missing data were replaced. Cronbach's alpha coefficient was used to estimate the internal consistency of scales. Means, standard deviations and pairwise correlations between the variables were calculated. In order to compare the two gender groups, an independent sample *t*-test was applied. The robust maximum likelihood (MLR) estimation method for structural equation modeling was used to test the theoretical model. We included internalization as a latent variable identified by internalization-general and internalization-athlete. All other variables were observed variables in the model. The exogenous variables (information, gender, BMI, age, and education) were allowed to covary. In order to measure the goodness-of-fit in path model multiple criteria were applied. The chi-square test, the comparative fit index (CFI), the Tucker–Lewis Index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR) were used to assess the model fit. A  $p > .05$  for the chi-square test, a CFI and TLI  $\geq .95$ , a

RMSEA  $\leq$  .05, and a SRMR  $\leq$  .08 indicated a good model (34). Analyses were conducted using SPSS 24 and Mplus version 7.11. statistical packages.

## Results

### Descriptive statistics and bivariate associations

Descriptive statistics and pairwise correlations between the variables measured at baseline are presented in Table 1. We did not find a significant gender difference in appearance-related sociocultural attitudes. However, levels of body image dissatisfaction and depression were significantly higher in women and BMI was significantly lower than in men. Appearance-related sociocultural attitudes showed a moderate and a strong positive association with each other, and all four showed a positive, weak and moderate positive association with body image dissatisfaction, respectively. Only internalization-general correlated significantly, positively but weakly with depression. BMI showed a significant, positive, weak association with both body image dissatisfaction and depression; however, the association between depression and body image dissatisfaction was found to be moderate.

Table 1. Means, standard deviations and pairwise correlations between the variables

Variables	Male (n=59- 66)	Female (n=236- 273)	t (df)	1.	2.	3.	4.	5.	6.
	M (SD)								
1. Internalization-general	21.8 (7.21)	22.4 (7.96)	t (294) = - 0.522	(.85)					
2. Internalization-athlete	12.6 (4.33)	12.0 (4.58)	t (305) = 0.916	.74***	(.79)				
3. Pression	18.7 (6.65)	19.8 (7.13)	t (299) = - 1.059	.57***	.53***	(.87)			
4. Information	24.2 (7.76)	25.3 (8.05)	t (294) = - 0.993	.58***	.49***	.58***	(.86)		
5. Body image dissatisfaction	48.8 (12.94)	60.4 (11.77)	t (327) = - 7.036***	.34***	.29***	.30***	.23***	(.89)	
6. Depression	13.9 (7.16)	19.0 (9.89)	t (126) = - 4.732***	.18**	.09	.07	.11+	.44***	(.88)
7. BMI	41.0 (9.72)	38.0 (6.86)	t (81) = 2.348*	.07	.03	-.06	-.09	.18**	.17**

Note: n = 339, + p < .10, \* p < .05, \*\* p < .01, \*\*\* p < .001. Cronbach's alpha coefficients are displayed on the diagonal in parentheses.

### Path analysis

The hypothesized structural equation model is presented in Fig. 1, while results are showed in Fig. 2. Fit indices suggest that the hypothesized model is a good fit to the data ( $\chi^2 = 688.23$ , df = 35,  $p < .001$ ; CFI = .995; TLI = .973; RMSEA = .039, 90% CI: .00 - .08; SRMR = .013). The results of the path analysis can be summarized below. With regard to direct paths, the greater importance given to messages from the media in relation to external appearance (i.e. information) is associated with an increased sense of pressure to achieve standards of appearance. Perceived pressure shows a positive relationship with the thin ideal internalization and body image dissatisfaction. Younger age predicts greater internalization of thin ideal. Body image dissatisfaction is higher in women than men; however, higher levels of obesity and thin ideal internalization predict increased levels of body dissatisfaction. Depression is higher in women and in those with lower (up to secondary) education, and there is

also a significant positive relationship with body dissatisfaction. The relationship between gender and depressive symptoms is partially mediated by physical dissatisfaction ( $\beta = .15$ ,  $SE = .03$ ,  $p < .001$ ).

Although there was no direct effect of information on depressive symptoms, two significant indirect paths were identified, including one path from information through pressure, internalization, and body image dissatisfaction to depression ( $\beta = .02$ ,  $SE = .01$ ,  $p = .006$ ), and one path from information through internalization and body image dissatisfaction to depression ( $\beta = .04$ ,  $SE = .02$ ,  $p = .010$ ). Although there was no direct effect of BMI on depressive symptoms, there was a significant indirect effect of BMI on depressive symptoms mediated by body image dissatisfaction ( $\beta = .09$ ,  $SE = .02$ ,  $p < .001$ ). Finally, age also contributed to the development of depressive symptoms only directly, through internalization and physical dissatisfaction ( $\beta = -.02$ ,  $SE = .01$ ,  $p = .013$ ).

The model explains 32.9% of the variance of perceived pressure, 54.7% of the variance of body ideal internalization, 31.8% of the variance of body dissatisfaction, and 23.3% of the variance of depressive symptoms.

## Discussion

The aim of the present study was to investigate the role of appearance-related sociocultural attitudes conveyed by the media in relation to the development of two common comorbid psychological features of obesity, namely, body dissatisfaction and depression, among participants of a hospital weight loss program in Hungary.

Scores above 15 points on the CES-D Depression Scale indicate significant degree of depression. In the present study the mean of CES-D was 18 points ( $SD = 9.63$ ), suggesting that the participants are characterised by increased level of depression. According to our results the depression level is higher among women, and individuals with lower education. Such relationship between depression and demographic variables are well-known from the national representative Hungarostudy research (35).

The bi-directional relationship between obesity and depression (5, 9) can be mediated by a number of factors, such as behavioral, cognitive, physiological, and social mechanisms (10). One of the cognitive factors mediating the relationship between obesity and depression is body image dissatisfaction (10, 17, 18). Results of previous studies show that exposure to unrealistic media images and messages has been identified as a risk factor for body dissatisfaction, and mental health concerns (12).

Our results showed that the importance given to appearance-related messages from the media and the perceived pressure from the media to achieve thinness did not directly contribute to the level of depressive symptoms, but led to increased body image dissatisfaction through thin ideal internalization, which in turn was strongly associated with depression. All of these support the need for psychologists and counselors to assess media consumption, body image, any ongoing depressive symptoms or potential for symptoms to develop. Providers should also emphasize how media images are often unrealistic (12).

In contrast to the correlations obtained in previous studies (12, 28), we could not detect a significant linear relationship between BMI and perceived pressures to attain the cultural ideals of physical appearance portrayed by the media. This may be due to the fact that in these studies the young age group (high school students, college students) was examined, while in the present research most of participants are middle-aged, and patients undergo a weight-loss treatment. Although body

dissatisfaction was remarkably stable across the adult life span for women, at least until they are quite elderly, the importance of body shape, weight and appearance decreased as women aged (36). Therefore, middle-aged and older women are less likely to compare their shapes with images from the media, and presumably due to this, the perceived pressure did not show a significant relationship with the increase in excess weight.

Nevertheless, our results suggest that body image dissatisfaction is predicted by the subjective importance of information from the media, namely through perceived pressure and through the internalization of the body ideal, and pressure is directly related to body image dissatisfaction in addition to the indirect path through thin ideal internalization. Body image dissatisfaction, in turn, partially mediates the relationship between gender and depressive symptoms, as well as the degree of obesity and depressive symptoms.

It should be also emphasized that in the case of the reciprocal relationship between obesity and depression (5, 9) a circular causal relationship can be assumed, including through health behaviors. For example, in a population-based Finnish study it was found that emotional eating and exercise-related self-efficacy play a partial mediating role between depression and obesity (37). In terms of eating behavior, it can also be said that depression affects unhealthy food choices in two ways. This is because higher levels of depression are associated not only with higher consumption of sweets, but also with lower consumption of vegetables and fruit (38).

In the present research, we did not find a meaningful association between appearance-related sociocultural attitudes and depression. Based on our results, it appears that depressive symptoms may be exacerbated in patients with overweight participating in multicomponent hospital weight loss therapy in association with other factors not examined by us. However, sociocultural attitudes related to appearance also play a significant role in the development of body dissatisfaction in the present study, which in turn is a correlate of depression. All this suggests that it is worth considering this topic for those taking weight loss treatments, as depression can be associated with behaviors that may contribute to the maintenance or exacerbation of overweight. Therefore, efforts should be made to eliminate or at least mitigate the triggers for depression.

All of this can be accomplished in everyday medical practice as follows. Assessing body dissatisfaction can be accomplished with a number of easy, quick-to-fill questionnaires, or even by visual analog scales. If body dissatisfaction is present to a significant extent, its causes should be mapped out, and if media messages about appearance and sociocultural pressure for weight loss play a significant role, education can be given. It may be proposed in this context to increase awareness and to explore of media influences regarding cultural attitudes related to "ideal" body. Cognitive ways to reduce body dissatisfaction are presented in several therapeutic manuals (e.g., (19, 39)). The first step is to educate patients about the essential differences between body image and appearance, the consequences of a negative body image during everyday life and the pursuit of weight control, and finally that of successful long-term weight management. The improvement of the body image is facilitated by the reduction of

social pressure, the increase of the personal significance of other areas of self-esteem and the reduction of the behavioral expression of the negative body image. An example of the latter is the examination of the body in a mirror, or the cognitive restructuring of negative automatic thoughts about the body (19). Since depressive symptoms go hand in hand with body dissatisfaction, increasing body satisfaction can help alleviate those symptoms. However, in the case of low and moderate or even severe depression, the use of low-intensity psychological interventions could be useful as part of a stepped care model (40).

Several limitations of the present study should be mentioned. We do not have any data about those people who refused participation in the study, thus we are not aware of the nature of the potential selection bias. Generalizability of our results is limited to a non-invasive, professional inpatient weight loss treatment program for people with excess weight. Future studies should include a wider variety of groups and wider segments of the population. There was no objective measure of anthropometric data, therefore, the BMI scores should be interpreted carefully. The cross-sectional study design does not permit causal conclusions; in addition, alternative models are conceivable. The SATAQ-3 measure does not include more current forms of media, such as the Internet (e.g., YouTube, online magazines, fashion blogs), and future studies should examine media consumption and perceived pressures related to body image as it pertains to Internet media.

Strengths of this study include the use of structural equation modeling to test the hypothesized model when the potential background variables (gender, age, education) were controlled. The data collection was carried out in a well-defined large sample derived from a clinical population. To our knowledge, this is also the first study that has examined the sociocultural determinants of depressive symptoms among participants of a hospital weight loss program.

## **Conclusion**

Despite of the above mentioned limitations, our results contribute to better understanding of predictors of body dissatisfaction and depression in clinical population of patients with excess weight. Increased body dissatisfaction can be a barrier to weight loss efforts, and can also play a role in the development of depression in individuals with excess weight. Therefore, assessing the extent and causes of body image dissatisfaction and depression and striving to reduce them can be a valuable addition to weight loss programs, thus supporting patients' efforts of long-term weight control.

## **List Of Abbreviations**

BSQ-SF14: Body Shape Questionnaire – Short form

CES-D: Center for Epidemiologic Studies Depression Scale

CFI: comparative fit index

CI: confidence interval

M: mean

RMSEA: root mean square error of approximation

SATAQ-3: Sociocultural Attitudes Towards Appearance Questionnaire

SD: standard deviation

SRMR: standardized root mean square residual

TLI: Tucker–Lewis Index

## **Declarations**

### **Ethics approval and consent to participate**

Ethical approval for this study was obtained from the Research Ethics Committee of the Faculty of Education and Psychology at Eötvös Loránd University (Budapest, Hungary). Participation was voluntary, written informed consent was obtained from all participants. No compensation was offered to participants.

### **Consent for publication**

Not applicable.

### **Availability of data and materials**

Data sharing not applicable to this article.

### **Competing interests**

The author declares that she has no competing interests.

### **Funding**

The financial background of the research was partly provided by ELTE PK 2008 strategic resource tender.

### **Acknowledgements**

Not applicable.

### **Author's information**

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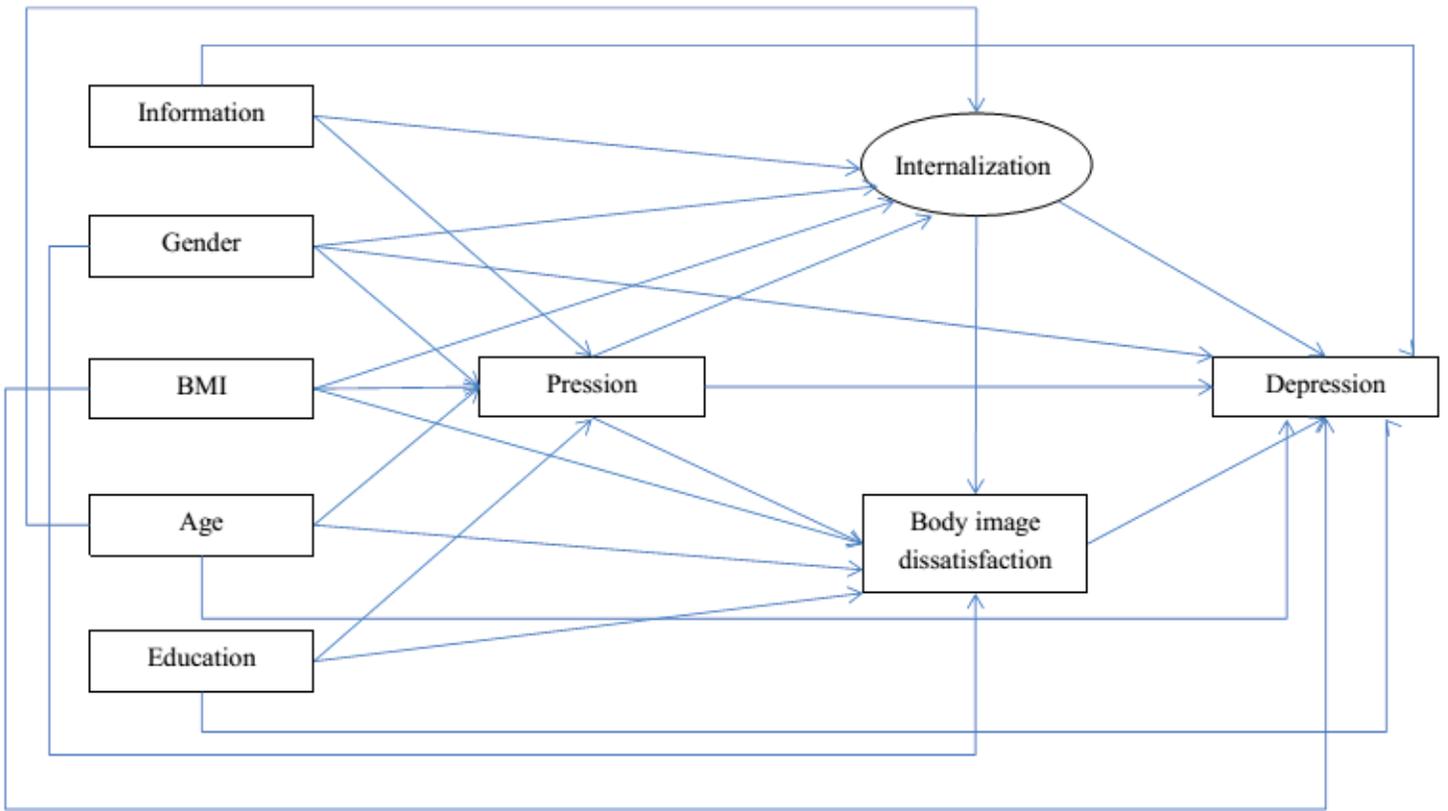
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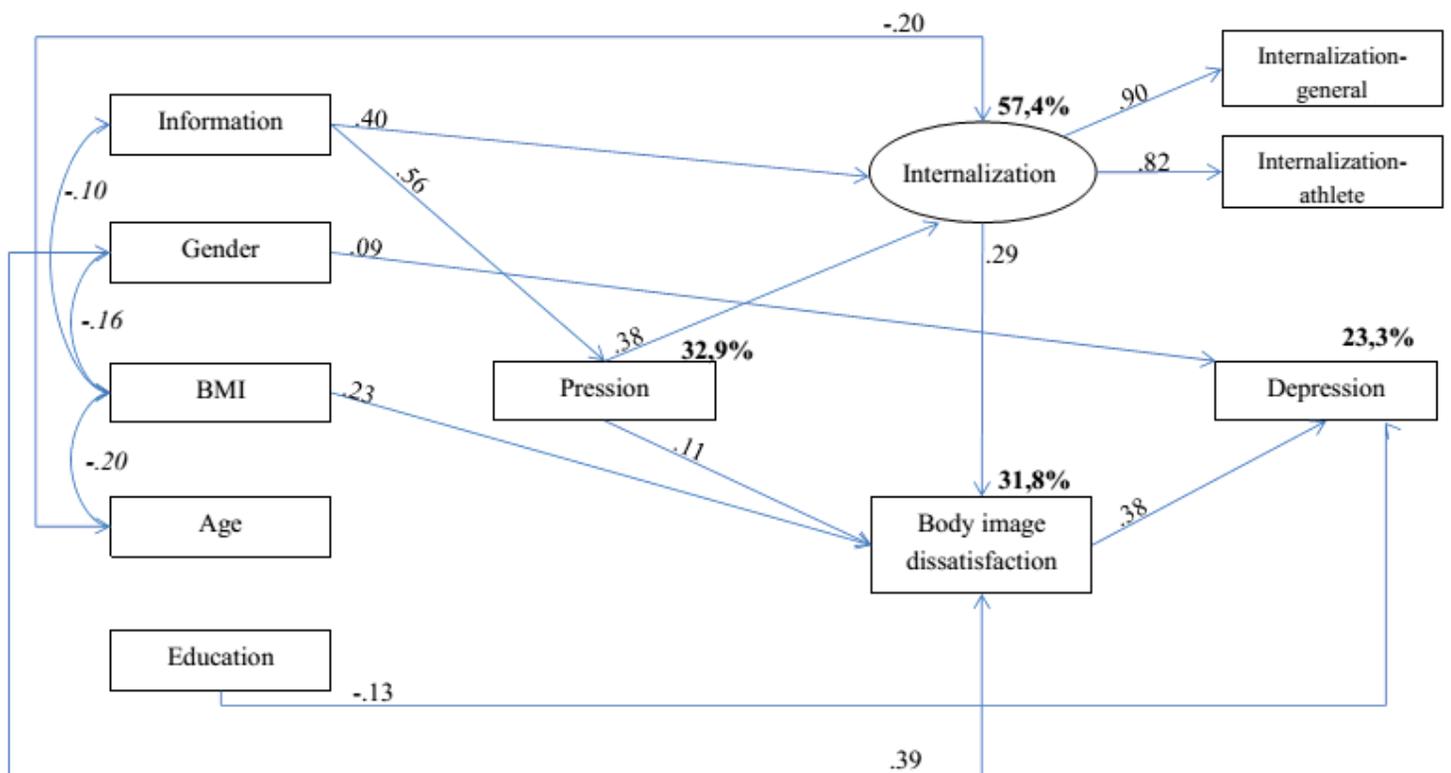
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## Figures



**Figure 1**

The tested path model which describes the associations between predictor, mediating and outcome variables



**Figure 2**

Results for the structural equation model which contains only significant ( $p < .05$ ) standardized regression/correlational coefficients ( $\chi^2 (35) = 688.23, p < .001; CFI = .995; TLI = .973; RMSEA = .039; SRMR = .013$ ).

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [STROBEchecklistcrosssectionalCzegledi2020.08.04.doc](#)
- [Questionnaire.docx](#)