

Determinants of Prediction of New Mothers' Dissatisfaction with their Body Shape

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ABSTRACT

Introduction: The aim of this cross-sectional study was to examine the relative contribution of the predictors: body mass index (BMI), weight gain during pregnancy, the importance of physical appearance, positive and negative partner comments, and sociocultural attitudes towards physical appearance in explaining the construct of dissatisfaction with personal body image after the first pregnancy. Total of 250 new mothers from Serbia participated in the online survey. The average age of the participants was 29.15 ± 5.03 years.

Methods: The following questionnaires were used: Socio-demographic and Pregnancy Data Questionnaire, General Body Shape Questionnaire (BSQ), Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ), and the Partner's Verbal Commentary on Physical Appearance Scale (VCOPAS-P). The measuring instruments showed satisfactory internal consistency on the Serbian sample.

Results: The results of the conducted hierarchical regression analysis showed that the predictor variables predicted 70% of the proportion of the total variance of the criterion of dissatisfaction with individual physical appearance in the maternity population. Additionally, a statistically significant partial contribution to the dependent variable was shown by the values of the three Beta coefficients of the three moderators: negative comments, the importance of physical appearance, and sociocultural attitudes.

Conclusion: Multivariate linear regression function, at the level of significance ($p \leq .01$ or $p \leq .05$), enables the identification of relevant predictor variables in predicting self-perception of dissatisfaction with body shape among new mothers in the Serbian-speaking area.

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Introduction

The prenatal period of a child's development, or the biological period of pregnancy, is the state of a woman, which begins with the fertilization of an egg by a sperm, during which the female body, for 40 days or nine months, undergoes multiple anatomical, physiological, psychological and hormonal transformations, which ensure the development of the fetus [1]. At the same time, these changes in the body have a significant impact on the body shape. Therefore, a pregnant woman must take care of proper nutrition and physical exercise [2].

Body dissatisfaction includes cognitive, perceptual and behavioural components [3,4]. The essence of body dissatisfaction is the discrepancy between perceived and socially generated ideal physical appearance. In addition, the greater the distinction, the greater the body dissatisfaction. Since the current ideal body shape assumes a strikingly thin female body that the majority of participants cannot objectively achieve, it is obvious that a higher BMI corresponds to dissatisfaction with one's own body shape. Recently, ontogenetic pregnancy and the postnatal period have received much attention as periods of high risk for dissatisfaction with physical appearance [5]. Regardless of the fact that pregnancy

is a joyful period during which weight gain is accepted for the well-being of the child, a large number of women perceive postnatal weight loss as an internal or exogenous stimulus, with an intense intention to return to their pre-natal weight as soon as possible. According to research women who have been pregnant for several months exhibit a higher level of body dissatisfaction, poorer physical fitness, and a distance from perfect physical appearance, which results in higher body dissatisfaction [6,7].

Dissatisfaction with physical appearance assumes that women learn and direct behaviors that are attractive to them [8].

Therefore, if the media massively promotes thin bodies as flawless, women perceive thin models as attractive, and try to imitate them through differentiated behaviors, such as dieting, training, and stimulating eating disorders. Gerbner's newer cultivation theory allows us to understand the consequences of biological growth and living in an environment dominated by media (television, the Internet, social networks, and movies) [9].

It assumes that television promotes identical predispositions and tendencies through repetitive images from childhood onwards, thus broadcasting an intense message about which physical characteristics are acceptable and which are not. The ideal shape and size of a woman's body has changed over the centuries, from

obese to thin. At the beginning of the 20th century, the ideal of female beauty gradually changed, so in the second half of the 20th century it was believed that the ideal female body was one that was thinner and had fewer curves. Usually, such a body shape is observed in celebrities, contestants in various beauty pageants, ballerinas and models, beauty models, e.g. Barbie dolls that represent an unrealistic, but socially acceptable image of femininity [10].

On the other hand, recently there has been a movement for body acceptance, which is directed towards the other extreme and normalizes the phenomenon of obesity [11].

Media today, especially in Western civilization, often negatively affects body dissatisfaction because they portray celebrities and models as objective, real people, and deliberately and skillfully manipulate false interpretations to create and model these images. They emphasize the idea that everyone's body is completely changeable, and that the physical ideal can be realized with a lot of effort and sacrifice. The results of the study [12].

Show that women who have a higher level of recognition and adoption of social criteria for perfect body shape manifest a higher degree of dissatisfaction with their own bodies. At the same time, research findings suggest that there is media pressure on women to achieve a minimum gestational body weight and return to their pre-birth body weight as quickly as possible, and such pressures contribute to dissatisfaction with their own body composition after childbirth. Additionally, the media has initiated the so-called "rapid recovery", where women share photos of increased weight loss, which increases self-consciousness and focus on own bodies even among those who have never been pregnant [13].

Although the media is a relevant generator of sociocultural pressures, we should not lose sight of the contribution of interpersonal relationships, e.g. family, peers and partners, which, due to their emotional saturation, can have an important influence on a woman after childbirth [14].

According to the Tripartite Theoretical Model, the generator of the emergence and development of body dissatisfaction and eating disorders consists of three basic sociocultural variables: media, peers, and parents [15].

The findings of study showed that the Tripartite Model is relevant for interpreting the generators of dissatisfaction with one's own body shape in women who have given birth, i.e., increased dissatisfaction with one's own body was identified with the contribution of sociocultural dimensions in the postpartum period. Also, predictor variables (negative comments and criticism from an intimate partner) can be damaging to a woman's body image [16].

Perceived pressure from a partner to be attractive is correlated with low self-esteem and increased anxiety in mothers related to their physical appearance [17].

Finally, when examining the phenomenon of dissatisfaction with physical appearance, the function of relevance that a person attaches to their body shape should not be neglected. Research findings have shown that the importance of body shape is an important factor in identifying body dissatisfaction and eating disorders [18].

Namely, if a person does not pay attention to their physical appearance, even if they believe they do not have an ideal body, it is minimally likely that this will contribute to their body satisfaction. Given that the relationships of the predictor variables: BMI, importance of physical appearance, negative and positive comments from partners, sociocultural attitudes and body dissatisfaction have not been examined in a Serbian pregnant sample, the aim of this cross-sectional study was to examine the relative contribution of the independent variables: BMI, body mass gain during pregnancy, importance of physical appearance, as well as sociocultural and interpersonal factors in explaining the variance of personal body dissatisfaction among new mothers in the Serbian-speaking area. Given the findings of previous studies, an alternative hypothesis (H) was tested: it is assumed that new mothers who have a higher BMI after childbirth, a higher frequency of negative comments from their partners, and attach greater importance to physical appearance and sociocultural attitudes towards physical appearance will manifest a relevant partial effect on individual dissatisfaction with their body shape.

Method

Participants and Procedure

A total of (N = 250) new mothers from the territory of the Republic of Serbia participated in this online survey. The age range of the participants ranged from 18 to 40 years, with an average age of 29.15 ± 5.03 . The criteria for selecting candidates were age over 18 years and use of social networks.

The sample was pertinent, and after giving informed consent, the participants were asked to forward the participation invitation with the measuring instruments, via the platform (Google forms), to other people from different districts of Serbia. Electronic participation in the research via the "snowball" method was voluntary, without financial compensation. The completed online questionnaires could not be correlated with the identity of the participants, who filled them in, because instead of names and e-mail addresses, they entered their passwords using all available characters. At the beginning of the research, the participants were given a short explanation about how to answer, whereby they could quit the survey at any time without any consequences. Filling in the measuring instruments took between 20 and 25 minutes. The research was conducted during December 2024, and was approved by the Ethics Committee of the Serbian Academy of Innovation Sciences in Belgrade.

Measuring Instruments

Socio-Demographic and Pregnancy Data Questionnaire

The questionnaire was constructed for the purposes of this research. It contains questions on general socio-demographic data (age and completed level of education), objective indicators of physical appearance (body mass gain, body mass index), and the time period after childbirth.

Body Mass Index (BMI)

The BMI instrument is calculated according to the World Health Organization by dividing body mass in kilograms by body height in m² (kg/m²) [18]. People are categorized into groups based on their BMI values: a) underweight: BMI < 18.5, b) normal weight: BMI 18.5 – 24.9, c) overweight: BMI 25 – 29.9 and d) obese: BMI > 30.

General Body Shape Questionnaire (BSQ)

The BSQ questionnaire consists of 34 items that examine dissatisfaction with one's own body appearance and "the feeling

of being fat" [19]. Participants rate the statements on a six-point Likert-type scale ("Do you feel fat after a large meal?", "Do you feel so bad about your appearance that you sometimes cry?") (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = very often, 6 = always). The total score is determined by adding up the estimates and ranges from 34 to 204. A higher score indicates greater body dissatisfaction. The internal consistency reliability of the Cronbach's Alpha coefficient in this study was ($\alpha = 0.89$).

The importance of physical appearance. Two items were used to examine the importance that participants attached to their own physical appearance. One statement refers to the importance they attached to their physical appearance before pregnancy, and the other to the importance they attached to it after childbirth ("How important was your physical appearance to you before pregnancy?" and "How important is your physical appearance to you after childbirth?"). They expressed their agreement on a five-point Likert-type scale (1 = completely unimportant, 2 = mostly unimportant, 3 = neither important nor unimportant, 4 = mostly important, 5 = very important).

Sociocultural Attitudes towards Appearance Questionnaire (SATAQ)

The SATAQ instrument includes 14 items distributed in two subscales: the awareness subscale and the internalization subscale [20]. The awareness subscale (statements 6, 8, 9, 10, 11, 12) assesses the identification of social criteria for ideal physical appearance ("In our society, fat people are seen as attractive."), and the internalization subscale (statements 1, 2, 3, 4, 5, 7, 13, 14) assesses the level of adoption of these standards ("I think clothes look better on thin people."). After each item is read, the participants assess the extent to which they agree with the given item on a five-point Likert-type scale (from 0 = I completely disagree to 5 = I completely agree). The results represent the sum of the scores on individual items. A higher score signals greater awareness, i.e. greater internalization of social standards related to ideal body shape. The internal consistency coefficient of this instrument is high ($\alpha = 0.90$).

Partner's Verbal Commentary on Physical Appearance Scale (VCOPAS-P)

The VCOPAS-P questionnaire measures the frequency of positive and negative opinions of the partner about the participant's physical appearance [21]. The instrument contains 26 items where the participants respond on a five-point Likert-type scale (from 1 = never to 5 = almost always). The questionnaire is two-factorial, where the first factor – "Partner's negative comments" relates to 10 items (e.g., "Don't you think you've eaten enough?") while the second factor has 11 items – "Partner's positive comments" (e.g., "I believe other girls want to look like you."). A higher score on the positive/negative interpretations scale signals a higher frequency of receiving partner's positive or negative interpretations of the body shape. The internal consistency reliability in this study for the Partner's negative comments subscale was ($\alpha = 0.89$), and for the Partner's positive comments subscale ($\alpha = 0.83$).

Statistical Analysis of Cronbach's Alpha Coefficient

In the processing of the data results, the central and dispersive

parameters were first calculated for all variables: arithmetic mean, standard deviation, skewness and kurtosis. The reliability of the used measuring instruments was tested using Cronbach's Alpha as an indicator of internal consistency. The linear relationship between the variables was determined using Pearson correlation coefficient, while multivariate hierarchical regression analysis was used to test the alternative hypothesis. The level of statistical significance was checked with the usual p-value, i.e. the probability of error of ($p \leq 0.05$ or $p \leq 0.01$). The results were processed using the IBM SPSS Statistical Package for the Social Sciences, version 21.

Results

Descriptive statistics

Table 1 shows descriptive parameters for five variables: body dissatisfaction, importance of physical appearance, sociocultural attitudes, partner's negative comments, and partner's positive comments.

Table 1: Basic Descriptive Statistics of the Distribution of Analyzed Variables

Variables	M	SD	Sk	Ku
Body dissatisfaction	108.12	29.73	0.83	0.26
The importance of physical appearance	10.06	1.53	0.37	0.94
Sociocultural attitudes	36.54	12.96	0.62	0.78
Partner's negative comments	30.01	09.85	0.45	0.69
Partner's positive comments	28.26	10.03	0.77	0.88

Legend: M – mean; SD – standard deviation; Sk – skewness; Ku – kurtosis. Standard error value (SE) of indicator Sk is 0.11, and of Ku is 0.19.

Analysis of descriptive statistical parameters shows that the participants achieve on average moderate to higher scores, which suggests that the majority of pregnant women are dissatisfied with their own physical appearance. Another measure of central tendency – standard deviation shows a significant dispersion of the participants' scores – from minimal theoretical results (39) to results that draw attention to striking dissatisfaction with body shape (178). The obtained coefficients of skewness and kurtosis vary within the optimal dispersion interval of two standard deviations ± 2 from the normal distribution, which is a prerequisite for conducting further statistical parametric analyses [22].

Correlation between Predictor and Criterion Variables

In order to define a statistically significant linear quantitative agreement between all pairs of variables included in the analysis, Pearson correlation coefficients were calculated that statistically significantly correlate with body dissatisfaction (Table 2).

Table 2: Intercorrelations between the Investigated Variables

Variables	1	2	3	4	5	6	7
1. BMI after childbirth	–						
2. Weight gain during pregnancy	0.09	–					
3. The importance of physical appearance	-0.20*	0.16*	–				
4. Negative comments	0.46**	0.21*	0.05	–			
5. Positive comments	-0.19*	-0.14*	0.01	-0.28**	–		
6. Sociocultural attitudes	0.05	0.17*	0.44**	0.14*	-0.30**	–	
7. Body dissatisfaction	0.49**	0.32**	0.19*	0.50**	-0.29**	0.72**	–

r – Pearson correlation coefficient; **p** – statistical significance * $p \leq 0.05$. ** $p \leq 0.01$.

Looking at the correlation matrix, it is observed that the values of the linear correlation coefficients of the measured variables mostly range between low or moderate intensity, from 0.15 to 0.62. Dissatisfaction with one's own physical appearance represents the criterion variable, and the other examined variables are predictors. Correlation analysis showed that there is no high intensity of cohesion among the predictor variables used. Predictor variables: higher weight gain during pregnancy, importance of physical appearance, more frequent negative partner comments, higher level of acceptance of sociocultural attitudes towards constitution are in a positive linear correlation with higher dissatisfaction with personal constitution, while the predictor – more frequent positive partner comments – negatively interacts with a higher degree of dissatisfaction with one's own body shape.

Table 3: Hierarchical Regression Analysis of Dissatisfaction with Physical Appearance

Predictor variables	Model I		Model II		Model III	
	β	SE	β	SE	β	SE
BMI after childbirth	0.410**	0.82	0.371**	0.56	0.342**	0.24
Weight gain during pregnancy	0.36**	0.65	0.125	-0.06	0.027	0.10
The importance of physical appearance	0.321**	0.34	0.182*	-0.03	0.115	0.09
Partner's positive comments			-0.132	-0.01	-0.092	0.20
Partner's negative comments			-0.201**	0.33	0.190*	0.49
Sociocultural attitudes R^2					0.300**	0.26
Corrected $R \Delta R^2$	0.400		0.480		0.700	

Legend: β = standardized regression coefficient; SE – standard error of the coefficient; R^2 = coefficient of multiple determination; ΔR^2 = change in the proportion of the explained variance after introducing a new block of variables; ** $p \leq 0.01$. * $p \leq 0.05$.

In the 1st step of the regression model, the following variables were included: BMI after childbirth, weight gain during pregnancy and the importance of physical appearance, in the 2nd step, the variables of the frequency of receiving positive and negative comments from the partner were added, while in the 3rd step, sociocultural variables⁵ were included because maximum correlations with the criterion variable – body dissatisfaction, on the basis of which a larger proportion of the variance of that predictor with the criterion was assumed compared to the other previously added predictors.

The variables included in the 1st step of the multivariate regression explained 40% of the variance in self-perceived dissatisfaction with physical appearance ($p = 0.001$), with the BMI variable having the maximum partial contribution ($\beta = .41$; $p < .01$). In the 2nd step, by including the variables of the frequency of

negative and positive partner comments, an additional 8% of the variance was explained ($p = 0.001$), with only the frequency of negative partner comments ($\beta = 0.40$; $p = 0.01$) showing to be a significant determinant of personal dissatisfaction with the body, while on the contrary, the frequency of positive partner comments in explaining dissatisfaction with body shape is redundant because it is statistically significantly different from zero. Additionally, in step 2 of the regression model, the moderator of body weight gain during pregnancy ceased to have a significant contribution to the prediction of body dissatisfaction. Finally, by including the variable of acceptance of sociocultural attitudes towards physical appearance in the 3rd step of the predictive model, a total of 70% of the variance of the criteria was explained, where the predictor acceptance of sociocultural attitudes towards physical appearance had a significant contribution to the self-perception of dissatisfaction with body shape. By including new predictors

in the 3rd step of the regression equation, the variable importance of physical appearance lost its relevant contribution in predicting the body dissatisfaction construct. Therefore, the significant determinants of the criterion – dissatisfaction with physical appearance were the beta weights of postpartum body mass, the frequency of negative partner comments, and the acceptance of individual sociocultural attitudes of pregnant women towards physical appearance. Finally, the obtained standardized regression coefficients in the analyzed multivariate predictive models confirmed the tested alternative hypothesis (H).

Discussion

This cross-sectional study examined the role of predictor variables: postpartum body mass index, weight gain during pregnancy, importance of physical appearance, positive partner comments, negative partner comments, and sociocultural attitudes in explaining personal dissatisfaction of pregnant women with own body shape. The results of the assessment of the psychometric properties of the used measuring instruments indicate their satisfactory reliability and internal consistency. Descriptive statistical parameters in this study showed that the majority of pregnant women are dissatisfied with their body shape, which is congruent with findings [23-25]. Such findings require focus and further research on the basis of which prevention programs will be constructed to prevent depression, eating disorders in pregnant women, and fetal health due to dissatisfaction with one's own body shape.

The calculated Pearson correlation coefficients between the variables examined in this study showed that dissatisfaction with one's own physical appearance in new mothers is in a statistically significant interaction with greater body weight gain, higher postpartum BMI, higher personal importance of physical appearance, more frequent negative comments from partners, infrequent positive comments from partners, as well as higher acceptance of sociocultural attitudes towards personal body shape. The obtained results are in accordance with the findings in studies [26-29].

The conducted hierarchical regression analysis of this empirical study included predictors that were significantly associated with the criterion variable body dissatisfaction. In the first step of the regression model, three predictors were introduced: postpartum body mass index, weight gain during pregnancy, and the importance of physical appearance, explaining 40% of the proportion of variability in the criterion of dissatisfaction with the physical appearance of the participants at the significance level ($p \leq 0.01$). In the second step of the regression equation, predictors of the frequency of the partner's positive and negative comments were included. The only relevant determinant of these psychological mechanisms was the frequency of negative comments from the partner, while the frequency of positive comments from the partner did not have a significant impact on the interpretation of dissatisfaction with the body shape, and body weight gain during pregnancy lost its relevant contribution in predicting personal dissatisfaction with personal body shape.

The obtained significant associations shown in the correlation matrix between the moderators: frequency of partner's positive comments and of negative comments, as well as weight gain, draw attention to the fact that the relationship between weight gain and frequency of partner's negative comments with dissatisfaction with physical appearance is a mediator of the frequency of partner's negative comments, i.e. a predictor of partner's negative comments. Therefore, the analyzed predictive model shows that if new mothers often receive negative comments

from their partners, they are more dissatisfied with their own body shape, regardless of the low body weight gain during pregnancy. Finally, by including predictors of sociocultural attitudes towards physical appearance in the third step of multivariate regression, the function of the significance of physical appearance in predicting personal body dissatisfaction ceased. However, the correlation matrix also showed a statistically significant interaction between the importance of physical appearance and acceptance of sociocultural attitudes towards physical appearance ($r = 0.44$, $p \leq 0.01$). Therefore, the sociological mechanism – acceptance of sociocultural attitudes towards physical appearance – may be a mediator between the importance of physical appearance and body dissatisfaction. New mothers who accept sociocultural attitudes towards physical appearance at a high level are more dissatisfied with their own physical appearance, although they do not attach great importance to body shape. The findings found in a sample of Serbian participants are consistent with the results of foreign research [30-33].

Pregnancy is a remarkably sensitive period for women, as numerous physical, hormonal, and psychological transformations occur in a relatively short period of time [33].

However, although body changes and weight gain are considered normal during pregnancy, the consequences of such sudden physical transformations after childbirth can generate dissatisfaction with one's own body, which should be examined due to the consequences for the mother and the child's well-being. In fact, dissatisfaction with one's body after childbirth is directly correlated with poor nutrition and postpartum depression [34].

The fact is that the media have a relevant function in current civilization and that citizens spend a significant part of their time under the influence of various media content. While accepting information from the media as objective truth, women repeatedly compare themselves to these often-unrealistic goals and perceive disappointment if they do not achieve their desired body shape. This results in a decline in the level of self-confidence and personal dissatisfaction with body shape [35].

The optimal method of counteracting negative media influences is media education, which refers to the training of a reasonable and critical user of media content [36].

The media mediate the reduction of sociocultural pressures towards a physical ideal of unattainable thinness and educate users to critically evaluate media messages in terms of reducing dissatisfaction with physical appearance. In fact, they motivate the development of a positive image of one's own body shape and self-esteem, at the risk of manifesting harmful physical and emotional implications [37-39].

Overall, this empirical study points to the importance of normal partner relationships as a protective factor for body dissatisfaction. The results of the study showed that due to social support and a specific form of intimacy that explains the connection, partner support is usually one of the protective dimensions for women's physical and mental health [40].

Namely, partners can be a critical generator of support after childbirth, and they need to be made aware of the importance of their role.

The research conducted also has certain methodological limitations. First, its online design can influence response bias and

the provision of socially desirable responses. Also, the predictor variable BMI – an indicator of below-average or above-average body mass – is not always an exact measure of obesity because it defines the proportion of body mass and body height, without taking into account the person's body structure and the segment of fat and muscle tissue. In addition, since BMI in this study was defined solely on the basis of the participants' perceptions of their personal body mass and height, it is likely not interpreted precisely. In fact, the participants could have provided incorrect data on body mass and height due to ignorance of their exact anthropometric measurements or due to embarrassment and shame. Therefore, in future longitudinal studies, body height and body mass should be measured during the direct conduct of the study in order to eliminate the aforementioned methodological limitations. Furthermore, in the Partner's Verbal Commentary on Physical Appearance Scale, all items that include negative partner comments only include aspects of physical appearance in correlation with body mass and obesity. However, the statements that included positive comments from partners referred to aspects of physical appearance (body weight, complexion, smile, hair, clothing). Therefore, since in the Partner's Verbal Commentary on Physical Appearance Scale all items refer exclusively to dissatisfaction with one's own appearance through the aspect of body weight and obesity, it is possible that this difference in the subscales of the Partner's Verbal Commentary on Physical Appearance Scale could have directed the interaction between the aforementioned variables.

Conclusion

This cross-sectional empirical study examined predictors of individual body dissatisfaction in a sample of Serbian new mothers. The average age of the participants was ($M_{age} = 29.15$, $SD_{age} = 5.03$). From a psychometric perspective, Cronbach's alpha coefficients show satisfactory reliability of the measuring instruments used, so they can be applied to the Serbian sample. The research findings showed that new mothers who are dissatisfied with the physical appearance of their own bodies have a higher BMI, a higher frequency of negative comments from their partners, a lower frequency of positive comments from their partners, and a higher acceptance of sociocultural attitudes towards their body shape. The results obtained in three extracted hierarchical regression analysis models, with 70% of the total variance explained by the criteria, suggest that the moderators: higher postpartum body mass, higher frequency of receiving negative partner comments, higher acceptance of sociocultural attitudes towards physical appearance, and negative minimal importance of physical appearance represent significant determinants of personal dissatisfaction with body shape in new mothers ($p \leq .01$ or $p \leq .05$). Based on these findings of multivariate regression, it is recommended that new mothers focus more on psychological-social mechanisms (negative comments from partners and sociocultural attitudes towards physical appearance), and less on the importance of self-perceived body shape after pregnancy. Definitely, the correlation-regression results of the analyzed predictive model have important theoretical and practical implications for the prevention of the construct of body dissatisfaction in the population of Serbian new mothers.

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