

Body image satisfaction, perfectionism, and eating disorder symptoms in pregnant women

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Abstract

Background and aims: Different psychological determinants play a role in the development of disordered eating attitudes, among which are self-esteem, body image dissatisfaction, perfectionism, depressiveness, and anxiety. However, previous studies have rarely been focused on eating disorder symptoms in pregnant women whose body image changes during pregnancy. Therefore, the goal of this study was to examine the occurrence of eating disorder symptoms in pregnant women and to examine whether they could be predicted by body image satisfaction, self-esteem and perfectionism, after controlling for body mass index (BMI), gestational weight gain, depression, and anxiety symptoms.

Method: In a cross-sectional study, 285 pregnant women anonymously filled in questionnaires measuring eating disorder symptoms (Eating Attitudes Test, Adolescent Dieting Scale), perfectionism (Positive and Negative Perfectionism Scale), self-esteem (Rosenberg Self-Esteem Scale), body image satisfaction (Body Areas Satisfaction Scale), depression symptoms (Edinburgh

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Postnatal Depression Scale), and anxiety (subscale anxiety from Depression, Anxiety, and Stress Scale).

Results: Between 1-3% of the pregnant women reported extreme symptoms of eating disorders. Out of the whole sample, in 27.1% the physician prescribed a diet, mainly due to gestational diabetes. However, out of the women who were not prescribed a diet, 21.7% reported moderate to extreme dieting. A hierarchical regression analysis showed that eating disorder symptoms could be predicted by a higher body mass index, higher positive perfectionism, and anxiety. Anxiety had a differential role in predicting dieting behavior in the women who were prescribed a diet and the ones who were not.

Conclusion: To conclude, a notable proportion of the women report risky eating behaviors and attitudes which should be screened for as an integral part of standard prenatal care.

Keywords: pregnancy, eating disorders, dieting, body image satisfaction, perfectionism, anxiety

Introduction

Many young women are dissatisfied with their body shape and weight and attempt to modify their bodies by dieting and exercising. The ideal physical appearance nowadays implies a thin woman's body, while emphasizing its importance leads to dissatisfaction with the body, low self-esteem, and use of various strategies to achieve such a look (Fairbrun, 1990; Forbes et al., 2005). As many as 80% of girls are dissatisfied with the appearance and show a desire for weight loss (Trivunčić, 1998). One in two female students believes that her ideal weight is on average 3 to 4 kilograms lower than the current weight (Gladović, 1999). As a result, between 40% and 50% of high school girls and female students are dieting (Pokrajac-Bulian, Mohorić, & Đurović, 2007; Rukavina, 2002). The most extreme variations in eating attitudes, such as frequent dieting, binge eating or vomiting, were reported in as many as 7.7% of high-school girls. These negative attitudes towards eating and dieting can ultimately lead to eating disorders (Pokrajac-Bulian et al., 2007).

The lifetime prevalence of all eating disorders is approximately 5% (Hudson, Hiripi, Pope, & Kessler, 2007). Psychological factors in the development of eating disorders have been given great attention and it has been established that different psychological determinants play a role in their development, among which are body image dissatisfaction, self-esteem, perfectionism, depression, and anxiety (Novković, 2003).

The body image represents the mental image of a person's own physical appearance, its evaluation, and the impact of these perceptions and attitudes on behavior (Pokrajac-Bulian, Živčić Bećirević, Vukmanović, & Forbes, 2007). Dissatisfaction with the body can range from a slight dissatisfaction with spe-

cific parts of the body to the extreme disparaging looks (Ambrosi-Randić, 2004). Self-esteem is one of the psychological factors which may affect the formation and/or maintenance of eating disorders and is commonly used to refer to the global self-evaluation. Low self-esteem is a feature that is present in people with eating disorders. Among women with a diagnosed eating disorder, the perception of body weight and body satisfaction was more disturbed in the ones with low self-esteem than by those with high self-esteem (Ambrosi-Randić, 2004). In contrast, high self-esteem reduces pressures from the environment to achieve slimness and preoccupation with the physical appearance in students (Phan & Tylka, 2006).

Just as self-esteem, perfectionism is often examined in the context of eating disorders. Perfectionism is an aspiration for flawlessness in different aspects of own life (Flett & Hewitt, 2002). Women with eating disorders generally show a greater need to present themselves with the image of perfection and avoid revealing their imperfections to others (Vulić-Prtorić & Cifrek-Kolarić, 2011). Perfectionism is a multidimensional construct that can be manifested in both adaptive and maladaptive traits (Greblo, 2012). Terry-Short, Owens, Slade, and Dewey (1995) distinguish between the positive motivation that lies behind perfectionist behavior, which is driven by a desire to achieve success, and the negative, which is driven by a desire to avoid failure.

In women, the perception of own body changes as the phases of puberty, pregnancy, and menopause progress, due to structural, functional, and hormonal changes (Ambrosi-Randić, 2004). Pregnancy is a period in which a woman experiences profound physical, physiological, and psychosocial changes. Also, a pregnant woman experiences substantial alterations in the form and weight of her body over a short period of time. Although these changes are a natural part of pregnancy, pregnant women experience conflicts with their values and concepts of beauty and sensuality, which can affect their attitudes about their own bodies. Also, pregnant women are in conflict between personal concern for their appearance and maternal concern for the fetal health (Chang, Chao, & Kenney, 2006). Scarce literature shows that pregnant women may feel thicker and less attractive (Fox & Yamaguchi, 1997; Goodwin, Astbury, & McMeeken, 2000). The body image is quite stable during pregnancy, showing that those women who had some concerns about the appearance at the beginning of pregnancy remained concerned throughout the pregnancy (Duncombe, Wertheim, Skouteris, & Kelly, 2008). Body dissatisfaction in pregnancy is associated, among other things, with a number of factors including the importance of body image and eating restraint (Duncombe et al., 2008; Fuller-Tyszkiewicz et al., 2013).

Despite the fact that the body image of pregnant women has attracted the attention of today's researchers, there is a lack of research exploring the specific

impact of pregnancy on body image and eating disorders. Studies focusing on eating disorders during pregnancy were mainly considering this as a maternal characteristic with respect to the obstetrical and neonatal outcome, showing that women with eating disorders were at greater risk for giving birth to a newborn with lower birth weight or microcephaly, while women with bulimia nervosa were, additionally, at a higher risk of miscarriage (Koubaa, Hällström, Lindholm, & Hirschberg, 2005; Micali, Simonoff, & Treasure, 2007). On the other hand, a prospective study showed that the majority of women with eating disorders had no complications during pregnancy and childbirth. However, those women who had active symptoms of anorexia or bulimia nervosa during pregnancy had a higher rate of cesarean section and postpartum depression (Franko et al., 2001). Given that up to 5% of pregnant women have broadly defined eating disorders (Bulik et al., 2007), it is important to understand eating attitudes and risky behavior in pregnant women and their contributing factors. However, these have been rarely addressed so far. Given that anxiety and depression are quite prevalent during pregnancy, with the rate of 12-25% (Bennett, Einarson, Taddio, Koren, & Einarson, 2004; Giardinelli et al., 2012), and that anxiety and depression have been related to eating pathology (Kaye, 2008; Szmuckler, 1987), it is necessary to control them when examining predictors of eating disorder symptoms. Furthermore, given that a physician, based on medical indications, may prescribe pregnant women a diet, it is important to examine the predictors of eating disorder symptoms separately in women on a prescribed and non-prescribed diet.

Therefore, the aim of this study was twofold: 1) to examine the prevalence of eating disorder symptoms in pregnant women and 2) to examine whether eating disorder symptoms could be predicted by body image satisfaction, self-esteem, and perfectionism, after controlling for depressiveness, anxiety, BMI, and gestational weight gain, in women on a prescribed and non-prescribed diet. We could not set a specific hypothesis regarding women on a prescribed diet. However, we hypothesized that eating disorder symptoms in pregnant women who were not on a prescribed diet could be predicted, as in general population of women, by body image dissatisfaction, low self-esteem, and high perfectionism.

Method

Participants

Out of the 285 pregnant women, aged from 18 to 46 years ($M = 31.29$, $SD = 5.14$), the majority was married and had graduated from college or university. The majority was in the third trimester, with average gestation age of 32.5

weeks ($SD = 8.0$). Out of the whole sample, 27.4% were prescribed a diet by a physician/obstetrician and 23.9% had gestational diabetes. Previous psychiatric treatment was reported by 6.3% of the women, among whom three women

Table 1. *Sociodemographic and obstetric data of the sample (N=285)*

	<i>n (%)</i>
Marital status	
married	229 (80.3%)
cohabiting	47 (16.5%)
single	9 (3.2%)
Education	
graduated from elementary school	3 (1.1%)
graduated from secondary school	97 (34.0%)
graduated from college	37 (13.0%)
graduated from university	148 (51.9%)
Perceived socio-economic status	
below average	26 (9.1%)
average	169 (59.3%)
above average	90 (31.6%)
Employment status	
employed full-time	223 (78.2%)
employed part-time	20 (7.0%)
unemployed	42 (14.8%)
Place of residence	
village	44 (15.4%)
a town (up to 100 000 inhabitants)	66 (23.2 %)
a city over 100 000 inhabitants	175 (61.4%)
Previous psychiatric treatment ¹	18 (6.3 %)
Psychopharmacological treatment ¹	20 (7.0 %)
Family history of psychiatric illness ¹	55 (19.3 %)
Parity	
primiparous	158 (55.4%)
multiparous	127 (44.6 %)
Stage of pregnancy	
1 st trimester	12 (4.2%)
2 nd trimester	48 (16.8 %)
3 rd trimester	225 (78.9 %)
Diet prescribed by physician ¹	78 (27.4%)
Gestational diabetes ¹	68 (23.9%)

Note: ¹ Percentage of "yes"-responses

(1.0%) reported eating disorder. A complete description of the sample characteristics is shown in Table 1.

Instruments

The Eating Attitudes Test (EAT; Garner & Garfinkel, 1979) is a 40-item questionnaire and the most commonly used measure of eating disorder symptoms. In this study, a shorter version, EAT-26, was used (Garner, Olmsted, Bohr, & Garfinkel, 1982). Participants respond using a 6-point scale, where the most extreme answer (*always*) gets 3 points, *very often* gets 2, *often* gets 1 point, and answers *sometimes*, *rarely*, and *never* get 0. A total score is the sum of all items with a range from 0 to 78, whereby a higher score indicates pathological eating attitudes or behavior. It consists of three subscales: dieting (example item: "Feel extremely guilty after eating"), bulimia and food preoccupation (example item: "Have the impulse to vomit after meals"), and oral control (example item: "Avoid eating when I am hungry"). The EAT was validated in Croatian population with high reliability and the same three-factor structure (Ambrosi-Randić & Pokrajac Bulian, 2005). In the current study, the reliability of the internal consistency measured as Cronbach's α was .70.

The Adolescent Dieting Scale (ADS; Patton et al., 1997; adapted by Ambrosi-Randić, 2001) was used to assess dieting. The 8-item scale assesses three typical dieting strategies: counting calories, reducing the amount of food, and skipping meals (example item "Do you try to leave food at meal times in order to avoid putting on weight?"). A response is rated on a 4-degree scale ranging from 0 (*rarely* or *never*) to 3 (*almost always*), and the total score range is from 0 to 24. Dieting categories can be determined, where 15 to 24 points represents extreme diet, 7 to 14 moderate, 1 to 6 minimum, and 0 points a non-diet. In the current study, Cronbach's α was .82.

The Body Areas Satisfaction Scale (BASS; Winstead & Cash, 1984; a modified version by Ambrosi-Randić, 1994) measures satisfaction with different parts of the body, including face parts, hair, lower, middle, and upper body parts, muscular tension, body weight, body height, and overall body appearance. The task of a participant is to report satisfaction on a 5-degree scale, from *very dissatisfied* (1) to *very satisfied* (5). The score ranges from 14 to 70, whereby a higher score indicates greater satisfaction with the body. In the current study, Cronbach's α was 0.92.

The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) measures global value orientation towards oneself. It consists of 10 statements, five in a positive and five in a negative direction (example item: "On the whole, I am satisfied

with myself"). The total score is determined by summing the 5-degree scale estimation scores (0 = *strongly disagree*, 4 = *strongly agree*), with the total range from 0 to 40, whereby a higher score reflects higher levels of self-esteem. The Cronbach's α ranged from .81 to .84 in the Croatian samples (Bezinović, 1988; Tkalčić, 1990). In this study, α was 0.81.

The Positive and Negative Perfectionism Scale (PNPS; Terry-Short et al., 1995) contains 40 items, whereby 20 refer to positive and 20 to negative perfectionism (example item: "I set impossibly high standards for myself"). The task of the participants was to report agreement with each statement on a 5-degree scale (from 1 = *disagree* to 5 = *completely agree*). The theoretical range of results for both subscales is from 20 to 100. The scale was translated into Croatian with high Cronbach's α of .79 and .90. for positive and negative perfectionism, respectively (Kapetanović, 2008). In this study, Cronbach's α was .89 and .90 for positive and negative perfectionism, respectively.

The Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) measures the depressive symptoms of women after childbirth and is also validated for use in pregnancy (Su et al., 2007). On a 10-item scale, participants estimate the severity of symptoms in the previous week on a scale from 0 to 3, with a total score ranging from 0 to 30, whereby a higher score indicates higher depression (example item: "I have been so unhappy that I have been crying", *yes, most of the time; yes, quite often; only occasionally; no, never*). The scale does not include somatic symptoms that could overlap with normal physical changes during pregnancy but assesses the cognitive and behavioral symptoms of depression and anxiety (Matthey, Fisher, & Rowe, 2013). The scale was translated into Croatian and validated (Nakić Radoš, Tadinac, & Herman, 2013). The Cronbach's α on this sample was .85.

The Depression, Anxiety and Stress Scale (DASS; Lovibond & Lovibond, 1995) comprises 42 items that assess the level of depression, anxiety, and stress. The DASS-21 is a shorter version, in which three subscales are described by seven items, and a higher score on each subscale indicates higher levels of symptoms. For the purpose of this research, only the anxiety subscale was used (example item: "I felt scared without any good reason"). The participant's task was to respond on a scale from 0 (*never*) to 3 (*almost always*) to the frequency of the symptoms in the previous week. In this study, Cronbach's α for anxiety subscale was .92.

The general information sheet comprised questions on sociodemographic data (age, marital status, educational level, perceived socio-economic status, place of residence, and employment status), previous psychiatric and psychopharmacological treatments, and obstetric variables (parity, gestational age,

weight and height, gestational weight gain, diet prescribed by physician, gestational diabetes). The BMI before pregnancy was calculated.

Procedure

The cross-sectional study is part of a larger study conducted at the Department of Obstetrics and Gynecology, University Hospital Centre "Sisters of Mercy" in Zagreb. The study was approved by the Ethics Committees of the Catholic University of Croatia and University Hospital Centre "Sisters of Mercy", respectively. Before signing the informed consent, the purpose of the research was explained to the participants. They completed the questionnaires anonymously while waiting for their regular prenatal check-up. The study was conducted in April and May 2017.

Results

Descriptive data of the EAT-26 and ADS score show a low occurrence of eating disorder symptoms among the pregnant women on average (Table 2). However, 2.8% of the pregnant women scored above the cut-off score on the EAT-26 and 1.1% reported extreme dieting on the ADS. Still, the majority of the women reported minimal dieting on the ADS (74.8%) and one in four women reported intermediate diet (24.4%). Furthermore, due to the fact that 27% of the women

Table 2. *Descriptive analysis of eating disorder symptoms and other psychological variables in pregnant women (N=285)*

	No of items	Score range	α	Min	Max	<i>M</i>	<i>SD</i>
Eating Attitude Test (EAT)	26	0-78	.70	2	27	7.5	4.5
Adolescent Dieting Scale (ADS)	8	0-24	.82	0	18	4.3	3.6
Body Image Satisfaction	14	14-70	.92	16	75	58.0	9.3
Self-esteem	10	0-40	.81	16	40	31.2	5.3
Positive Perfectionism	20	20-100	.89	39	98	72.9	10.2
Negative Perfectionism	20	20-100	.90	19	83	50.4	11.4
Depressiveness	10	0-30	.85	0	20	6.1	4.6
Anxiety	7	0-21	.92	0	15	3.2	3.4

reported that their physician prescribed them a diet, which was similar to the percentage of the women who were intermediate or extreme dieting, we wanted to examine the overlap between these women. Out of 207 women who were

Table 3. *Pearson's correlation coefficients between sociodemographic, obstetric, and psychological variables with the EAT-26 and ADS*

	EAT-26	ADS
Sociodemographic		
Age	-.02	.16**
Education level ¹	.09	.08
Work status ²	.05	-.01
Perceived socioeconomic status ³	.03	.05
Marital status ⁴	.01	-.01
Place of residence ⁵	.02	.09
History of psychopathology		
Depressiveness > 2 weeks	.06	.11
Psychiatric treatment ⁷	.02	.13*
Psychopharmacological treatment ⁷	-.00	.17*
Family history of psychiatric illness ⁷	.06	.02
Obstetric		
Parity ⁶	-.01	.07
Planned pregnancy ⁷	.05	.03
Gestational diabetes ⁷	.07	.13*
Insulin intake ⁷	.04	-.01
Diet prescribed by physician ⁷	.09	.15*
Body Mass Index (kg/m ²)	-.03	.29**
Gestational Weight Gain (kg)	-.02	-.07
Psychological variables		
Body image satisfaction	.07	-.14*
Self-esteem	.01	-.03
Positive perfectionism	.34**	.26**
Negative perfectionism	.18**	.17**
Depression	.04	.11
Anxiety	.05	.16**

Note: * $p < .05$, ** $p < .01$; ¹ Educational level: 1=graduated from elementary school, 2=graduated from secondary school, 3=graduated from college, 4=graduated from university; ²Work status: 1=regularly employed, 2=partially employed, 3=unemployed; ³ Perceived socioeconomic status: 1=below average, 2=average, 3=above average; ⁴ Marital status: 1=married, 2=cohabiting, 3=single; ⁵Place of residence: 1=village, 2=a town (up to 100 000 inhabitants), 3=a city over 100 000 inhabitants; ⁶Parity: 1=primiparous, 2=multiparous; ⁷1=no, 2=yes.

not prescribed a diet by their physician, there were 45 women, or 21.7%, who reported symptoms of an eating disorder (43 women with intermediate and 2 women with extreme dieting).

Next, the correlations between sociodemographic, obstetric, and psychological variables with eating disorder symptoms were examined (Table 3). Older age, previous psychiatric or psychopharmacological treatment, higher BMI, and prescription of a diet by a physician were significantly related to dieting reported on the ADS. Of the psychological variables, higher levels of positive perfectionism, negative perfectionism and anxiety, and lower levels of body image satisfaction were related to higher levels of eating disorder symptoms.

Table 4. Results of the multiple regression analysis with the EAT-26 as the criterion in pregnant women on prescribed ($N=78$) and non-prescribed diet ($N=207$)

	Prescribed diet (<i>N</i> = 78)			Non-prescribed diet (<i>N</i> = 207)		
	<i>b</i>	<i>SE b</i>	β	<i>b</i>	<i>SE b</i>	β
Step 1						
Constant	5.77	3.43		10.62	2.20	
Body Mass Index (kg/m²)	0.11	0.12	.13	-0.17	0.09	-.13
Gestational Weight Gain (kg)	0.06	0.09	.09	-0.02	0.05	-.03
Depressiveness	-0.01	0.15	-.01	0.02	0.09	.02
Anxiety	-0.29	0.21	-.21	0.18	0.11	.14
	<i>R</i> ² = .047 <i>F</i> = 0.91; <i>p</i> = .465			<i>R</i> ² = .036 <i>F</i> = 1.86; <i>p</i> = .120		
Step 2						
Constant	-11.41	7.07		-0.62	4.64	
Body Mass Index (kg/m²)	-0.01	0.11	-.01	-0.17	0.09	-.14
Gestational Weight Gain (kg)	0.03	0.08	.05	-0.02	0.05	-.03
Depressiveness	0.02	0.14	.02	-0.02	0.09	-.02
Anxiety	-0.37	0.19	-.26	0.17	0.11	.13
Body Image Satisfaction	0.07	0.05	.15	0.02	0.04	.04
Self-esteem	0.04	0.11	.04	0.00	0.07	.00
Positive Perfectionism	0.18	0.05	.44**	0.11	0.04	.24**
Negative Perfectionism	0.04	0.06	.11	0.05	0.07	.12
	<i>ΔR</i> ² = .243 <i>F</i> = 5.88; <i>p</i> = .000 <i>R</i> ² = .290 <i>F</i> = 3.52; <i>p</i> = .002			<i>ΔR</i> ² = .091 <i>F</i> = 5.14; <i>p</i> = .001 <i>R</i> ² = .127 <i>F</i> = 3.58; <i>p</i> = .001		

Note: * $p < .05$, ** $p < .01$.

Finally, a hierarchical regression analysis was carried out to examine whether eating disorder symptoms in the pregnant women could be predicted by body image satisfaction, self-esteem, and perfectionism, after controlling for anxiety, depression, BMI, and gestational weight gain. Given that the correlational analysis showed that women who were prescribed a diet by their physician reported a higher score on dieting and that there were pregnant women who were not prescribed a diet but were dieting anyway, we performed separate regression analyses for the women on a prescribed and non-prescribed diet. Also, we repeated the analysis using the EAT-26 (Table 4) and ADS as the criterion (Table 5). Using the EAT-26 as a measure of eating disorder symptoms, it was established that higher perfectionism was a positive predictor in both groups.

Table 5. Results of the multiple regression analysis with the ADS as the criterion in pregnant women on prescribed (N=78) and non-prescribed diet (N=207)

	Prescribed diet (N=78)			Non-prescribed diet (N=207)		
	<i>b</i>	<i>SE b</i>	β	<i>b</i>	<i>SE b</i>	β
Step 1						
Constant	-2.70	2.60		-1.09	1.70	
Body Mass Index (kg/m ²)	0.32	0.09	.44**	0.19	0.07	.19**
Gestational Weight Gain (kg)	0.06	0.07	.11	-0.00	0.04	-.01
Depressiveness	0.10	0.11	.12	-0.02	0.07	-.03
Anxiety	-0.32	0.16	-.27	0.27	0.09	.26**
	$R^2 = .186$ $F = 4.17; p = .004$			$R^2 = .105$ $F = 5.92; p = .000$		
Step 2						
Constant	-11.88	5.87		-5.50	3.64	
Body Mass Index (kg/m ²)	0.28	0.09	.38**	0.17	0.07	.16*
Gestational Weight Gain (kg)	0.06	0.07	.11	-0.00	0.04	-.00
Depressiveness	0.08	0.12	.10	-0.05	0.07	-.07
Anxiety	-0.38	0.16	-.33*	0.26	0.09	.25**
Body Image Satisfaction	-0.01	0.04	-.03	-0.05	0.03	-.12
Self-esteem	0.08	0.09	.12	0.04	0.06	.07
Positive Perfectionism	0.07	0.04	.20	0.07	0.03	.19*
Negative Perfectionism	0.06	0.05	.19	0.02	0.03	.07
	$\Delta R^2 = .086$ $F = 2.03; p = .099$ $R^2 = .272$ $F = 3.22; p = .004$			$\Delta R^2 = .061$ $F = 3.60; p = .007$ $R^2 = .166$ $F = 4.91; p = .000$		

Note: * $p < .05$, ** $p < .01$.

However, an interesting pattern was observed when the ADS was used as a measure of eating disorder symptoms. In both groups, the symptoms could be predicted by higher BMI and anxiety. However, anxiety had a differential role in prediction for the prescribed and non-prescribed diet group. Namely, in the non-prescribed diet group, higher levels of anxiety predicted more dieting. On the other hand, in the prescribed diet group, lower levels of anxiety predicted more dieting. These predictors accounted for the significant amount of eating disorder symptoms variance, with the somewhat lower percentage of variance explained in the non-prescribed diet group (12.7%-16.6%) than in the prescribed diet group (27.2%-29.0%).

Discussion

Given that the previous research has given very little attention to eating disorders symptoms during pregnancy, the aim of this study was to examine their occurrence and predictors. Owing to the lack of research exploring the disordered eating attitudes in pregnant women, we could not predict the occurrence of these attitudes and behaviors in this specific situation. However, the results showed a low occurrence of extreme eating disorder symptoms among the pregnant women (1-3%), with the majority of the women reporting minimal dieting. One in four women were prescribed a diet by their physician or obstetrician, mainly as a way of controlling gestational diabetes. However, a result which should raise a concern was that 22% of the women who were not prescribed a diet by a physician were dieting anyway. This result emphasizes the importance of nutritional and psychological assessment of women during pregnancy when screening for eating disorder symptoms should be applied. Dieting during pregnancy is sometimes necessary and considered a desirable health behavior for the neonatal outcome. On the other hand, when dieting is not under expert control and when women themselves engage in different dieting behaviors, it can have detrimental effects, being a risk factor for neural tube defect, miscarriage, lower birth weight, and cesarean section (Carmichael, Shaw, Schaffer, Laurent, & Selvin, 2003; Franko et al., 2001; Koubaa et al., 2005; Micali et al., 2007).

Furthermore, based on the literature in general, we hypothesized that body image dissatisfaction, low self-esteem, and high perfectionism would be significant predictors of disordered eating attitudes in pregnant women (Novković, 2003). This hypothesis was partially supported by the results. Namely, lower body image satisfaction was related to higher levels of dieting. However, after controlling for BMI and anxiety, it was no longer a significant predictor, nor was self-esteem. On the other hand, in line with the expectations, perfectionism was

a significant predictor of dieting. There are a number of studies that indicate the association between perfectionism and eating disorders, showing that both dimensions of perfectionism, the adaptive and non-adaptive, were positively associated with eating disorders (Davis, 1997). However, in this study, positive perfectionism, but not the negative perfectionism, was a significant predictor of eating disorder symptoms. Although positive and negative perfectionism are in low positive association (Lauri Korajlija, 2005; Terry-Short et al., 1995), these traits can act independently (Molnar, 2006). Also, it is important to emphasize that, in this study, positive perfectionism was a significant predictor of eating disorder symptoms in both women who have been prescribed diet and women who have not. Positive perfectionism has, in its core, a positive motivation as striving for success (Therry-Short et al., 1995) and can be seen as a preferred feature in the healthcare setting. Namely, these women could find it easier to maintain a diet, which is beneficial when a diet is a part of prescribed prenatal care. However, dieting in the group of women who have not been prescribed a diet was also predicted by positive perfectionism, which is in line with the notion that both positive and negative perfectionism can be maladaptive in the context of eating disorders (Bardone-Cone et al., 2007).

An interesting result of this study was the importance of anxiety role in the dieting behavior during pregnancy. Considering that eating pathology has the purpose of emotion regulation, it was justified to examine the role of anxiety in eating disorder symptoms (Heatherton & Baumeister, 1991). Namely, in our study anxiety predicted dieting both in the women on a prescribed and non-prescribed diet, but with a different direction. In the women on a prescribed diet, lower levels of anxiety predicted higher adherence to dieting, while in the women on a non-prescribed diet, higher levels of anxiety predicted higher levels of dieting. Although the cross-sectional design cannot explain the cause-effect relationship, we may speculate that the women with a diet prescription who exhibited more dieting felt less anxious because they followed their obstetrician's advice and promoted good prenatal health behavior. On the other hand, the women without the necessity to follow a medical diet during pregnancy were driven by higher levels of anxiety in their dieting behavior. This is consistent with previous studies showing a relationship between eating disorder and anxiety. One in two women with anorexia nervosa also have co-morbid at least one anxiety disorder, which mostly has the onset before anorexia (Kaye, 2008). Similarly to this, in patients with bulimia nervosa, there is also a history of anxiety disorders where in most cases anxiety disorders preceded the bulimia (Bulik et al., 1996).

Several limitations of the study should be addressed. First of all, this was a cross-sectional study with self-evaluation questionnaires and a diagnostic in-

terview was not administered, which should be included in order to establish the presence of an eating disorder based on diagnostic criteria. Furthermore, the sample was not equally represented in all trimesters and the majority was in the third trimester of the pregnancy. Since a previous study showed that body image dissatisfaction is more pronounced in the first and the second trimesters of the pregnancy (Skouteris, Carr, Wertheim, Paxton, & Duncombe, 2005), future studies should follow women prospectively throughout the pregnancy. Finally, the timing of the study could have affected the results. Namely, the study was conducted in April and May, preceding the summer, a period when women pay somewhat more attention to their body and dieting. Also, future studies should investigate whether the increased dieting during pregnancy is a normative behavior with a goal of providing healthy food and adequate nutrition for the own and fetal health or if it presents the risk of a newly-onset eating disorder during pregnancy.

To conclude, the majority of the pregnant women do not report disordered eating attitudes nor engage in the extreme dieting. However, a small proportion of the women (1-3%) report risky eating attitudes and behaviors which can be predicted by positive perfectionism, body mass index, and anxiety. What is worrying is that about 20% of the pregnant women who were not prescribed a diet by their physician engage in dieting and risky behavior. Bulik et al. (2007) point out that pregnancy is an opportunity for women with eating disorders to confront their problems and decrease their bulimic behavior, just as women in pregnancy quit smoking or cut down on alcohol intake. However, for other women, it is a time of vulnerability, especially the time for binge eating, driven by the interplay of neurobiological and psychological factors. Also, Davies and Wardle (1994) showed that, although pregnant women had fewer dietary restraints than non-pregnant women, they retained the same body size ideals as non-pregnant women. Therefore, screening for risky eating habits and dieting should be a part of the standard prenatal care. Pregnant women should be offered nutritional advice and psychological support in order to detect and prevent psychopathology, with the view to ensure optimal maternal and child health (Meireles, Neves, Carvalho, & Ferreira, 2017). Standard prenatal care should be accompanied by education and counseling about a healthy lifestyle during pregnancy and postpartum focused on achieving the desired body image rather than the desired weight.

References

- Ambrosi-Randić, N. (1994). Validation of body image construct in 19-year-old men. (Unpublished master thesis). Zagreb: University of Zagreb.

- Ambrosi-Randić, N. (2001). Učestalost i korelati provođenja dijetе u adolescenciji [Frequency and correlates of dieting in adolescence]. *Društvena istraživanja*, 10(1), 415-430.
- Ambrosi-Randić, N. (2004). *Razvoj poremećaja hranjenja* [Development of eating disorders]. Jastrebarsko: Naklada Slap.
- Ambrosi-Randić, N., & Pokrajac-Bulian, A. (2005). Psychometric properties of the eating attitudes test and children's eating attitudes test in Croatia. *Eating and Weight Disorders*, 10, e76–e82. doi:10.1007/BF03327495
- Bennett, H. A., Einarson, A., Taddio, A., Koren, G., & Einarson, T. R. (2004). Prevalence of depression during pregnancy: systematic review. *Obstetrics & Gynecology*, 103(4), 698-709. doi:10.1097/01.AOG.0000116689.75396.5f
- Bezinović, P. (1988). *Samopercepcija osobne kompetentnosti kao dimenzija vrednovanja vlastitog ja* [Self-perception of personal competency as a dimension of self-evaluation]. (Unpublished doctoral dissertation). Zagreb: Faculty of Humanities and Social Sciences.
- Bardone-Cone, A. M., Wonderlich, S. A., Frost, R. O., Bulik, C. M., Mitchell, J. E., Uppala, S., & Simonich, H. (2007). Perfectionism and eating disorders: Current status and future directions. *Clinical Psychology Review*, 27(3), 384-405. doi:10.1016/j.cpr.2006.12.005
- Bulik, C.M., Sullivan, P.F., & Joyce, P.R. (1996). The significance of a history of childhood sexual abuse in bulimia nervosa. *Journal of Clinical and Forensic Medicine*, 3, 187.
- Bulik, C. M., Von Holle, A., Hamer, R., Berg, C. K., Torgersen, L., Magnus, P., ... & Reichborn-Kjennerud, T. (2007). Patterns of remission, continuation and incidence of broadly defined eating disorders during early pregnancy in the Norwegian Mother and Child Cohort Study (MoBa). *Psychological Medicine*, 37(8), 1109-1118. doi:10.1017/S0033291707000724
- Carmichael, S. L., Shaw, G. M., Schaffer, D. M., Laurent, C., & Selvin, S. (2003). Dieting behaviors and risk of neural tube defects. *American Journal of Epidemiology*, 158(12), 1127-1131. doi: 10.1093/aje/kwg286
- Chang, S.-R., Chao, Y.-M., & Kenney, N. J. (2006). I am a woman and I'm pregnant: Body image of women in Taiwan during the third trimester of pregnancy. *Birth*, 33(2), 147–153. doi:10.1111/j.0730-7659.2006.00087.x
- Cox, J. L., Holden, J. M., & Sagovsky, R. (1987). Detection of postnatal depression. Development of the 10-item Edinburgh postnatal depression scale. *British Journal of Psychiatry*, 150, 782-786. doi:10.1192/bjp.150.6.782
- Davies, K., & Wardle, J. (1994). Body image and dieting in pregnancy. *Journal of Psychosomatic Research*, 38(8), 787-799. doi:10.1016/0022-3999(94)90067-1
- Davis, C. (1997). Normal and neurotic perfectionism in eating disorders: An interactive model. *International Journal of Eating Disorders*, 22, 421–426. doi:10.1002/(SICI)1098-108X(199712)22:4<3C421::AID-EAT7%3E3.0.CO;2-O
- Duncombe, D., Wertheim, E. H., Skouteris, H., Paxton, S.J., & Kelly, L. (2008). How well do women adapt to changes in their body size and shape across the course of pregnancy. *Journal of Health Psychology*, 13(4), 503-515. doi:10.1177/1359105308088521

- Fairburn, C. G., & Welch, S. L. (1990). The impact of pregnancy on eating habits and attitudes to shape and weight. *International Journal of Eating Disorders*, 9(2), 153-160. doi:10.1002/1098-108X(199003)9:2%3C153::AID-EAT2260090204%3E3.0.CO;2-8
- Flett, G. L., & Hewitt, P. L. (2002). *Perfectionism: Theory, research, and treatment*. Washington: American Psychological Association.
- Forbes, G. B., Adam-Curtis, L., Jobe, R. L., White, K. B., Revak, J., Živčić-Bećirević, I., Pokrajac-Bulian, A. (2005). Body dissatisfaction in college women and their mothers: Cohort effects, developmental effects, and the influences of body size, sexism, and the thin body ideal. *Sex Roles*, 53, 281-298. doi:10.1007/s11199-005-5686-2
- Fox, P., & Yamaguchi, C. (1997). Body image change in pregnancy: A comparison of normal weight and overweight primigravidas. *Birth*, 24(1), 35-40. doi:10.1111/j.1523-536X.1997.00035.pp.x
- Franko, D. L., Blais, M. A., Becker, A. E., Delinsky, S. S., Greenwood, D. N., Flores, A. T., ... & Herzog, D. B. (2001). Pregnancy complications and neonatal outcomes in women with eating disorders. *American Journal of Psychiatry*, 158(9), 1461-1466. doi:10.1176/appi.ajp.158.9.1461
- Fuller-Tyszkiewicz, M., Skouteris, H., Watson, B.E., & Hill, B. (2013). Body dissatisfaction during pregnancy: a systematic review of cross-sectional and prospective correlates. *Journal of Health Psychology*, 18(11), 1411-1421. doi:10.1177/1359105312462437
- Garner, D. M., & Garfinkel, P. E. (1979). The Eating Attitudes Test: An index of the symptoms of anorexia nervosa. *Psychological Medicine*, 9, 273-279. doi:10.1017/S0033291700030762
- Garner, D. M., Olmsted, M. P., Bohr, Y., & Garfinkel, P. E. (1982). The Eating Attitudes Test: Psychometric features and clinical correlates. *Psychological Medicine*, 12, 871-878. doi: 10.1017/S0033291700049163
- Giardinelli, L., Innocenti, A., Benni, L., Stefanini, M. C., Lino, G., Lunardi, C., Svelto, V., Afshar, S., Bovani, R., Castellini, G., & Faravelli, C. (2012). Depression and anxiety in perinatal period: prevalence and risk factors in an Italian sample. *Archives of Women's Mental Health*, 15, 21-30. doi:10.1007/s00737-011-0249-8
- Gladović, B. (1999). *Nezadovoljstvo vlastitim tjelesnim izgledom kod studenata i studentica [Body image dissatisfaction in male and female students]*. (Unpublished diploma thesis). Rijeka: University of Rijeka.
- Goodwin, A., Astbury, J., & McMeeken, J. (2000). Body image and psychological well-being in pregnancy: A comparison of exercisers and non-exercisers. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 40(4), 442-447. doi:10.1111/j.1479-828X.2000.tb01178.x
- Greblo, Z. (2012). Što se skriva iza pojma "perfekcionizam"? Povijest proučavanja i pregled različitih konceptualizacija perfekcionizma [What is hidden behind the term "perfectionism"? History of different conceptualisation of perfectionism]. *Psihologijske teme*, 21(1), 195-212.
- Heatherton, T. F., Baumeister, R. F. (1991). Binge eating as an escape from self-awareness. *Psychological Bulletin*, 110, 86-108.

- Hudson, J. I., Hiripi, E., Pope, H. G., & Kessler, R. C. (2007). The prevalence and correlates of eating disorders in the National Comorbidity Survey Replication. *Biological psychiatry*, 61(3), 348-358. doi:10.1016/j.biopsych.2006.03.040
- Kapetanović, A. (2008). *Samopoštovanje i perfekcionizam kod srednjoškolki i studentica [Self-esteem and perfectionism in female and male high-school students]*. (Unpublished diploma thesis). Zagreb: University of Zagreb.
- Kaye, W. (2008). Neurobiology of anorexia and bulimia nervosa. *Physiology and Behavior*, 94, 121-135. doi:10.1016/j.physbeh.2007.11.037
- Kouba, S., Hällström, T., Lindholm, C., & Hirschberg, A. L. (2005). Pregnancy and neonatal outcomes in women with eating disorders. *Obstetrics & Gynecology*, 105(2), 255-260. doi:10.1097/01.AOG.0000148265.90984.c3
- Lauri Korajlija, A. (2005). *Povezanost perfekcionizma i atribucijskog stila s depresivnošću i anksioznošću [Relationship between perfectionism and negative attributional style with depression and anxiety]*. (Unpublished master thesis). Zagreb: University of Zagreb.
- Leight, K. L., Fitelson, E. M., Weston, C. A., & Wisner, K. L. (2010). Childbirth and mental disorders. *International Review of Psychiatry*, 22, 453-471. doi:10.3109/09540261.2010.514600
- Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the Depression Anxiety Stress Scales*. (2nd. Ed.). Sydney: Psychology Foundation.
- Matthey, S., Fisher, J., & Rowe, H. (2013). Using the Edinburgh postnatal depression scale to screen for anxiety disorders: Conceptual and methodological considerations. *Journal of Affective Disorders*, 146(2), 224-230. doi:10.1016/j.jad.2012.09.009
- Meireles, J. F. F., Neves, C. M., Carvalho, P. H. B., & Ferreira, M. E. C. (2017). Body image, eating attitudes, depressive symptoms, self-esteem and anxiety in pregnant women of Juiz de Fora, Minas Gerais, Brazil. *Ciencia & Saúde Coletiva*, 22(2), 437-445. doi:10.1590/1413-81232017222.23182015
- Micali, N., Simonoff, E., & Treasure, J. (2007). Risk of major adverse perinatal outcomes in women with eating disorders. *The British Journal of Psychiatry*, 190(3), 255-259. doi:10.1192/bjp.bp.106.020768
- Molnar, M. (2006). *Povezanost perfekcionizma sa samopoštovanjem i zadovoljstvom kvalitetom života [Relationship between perfectionism, self-esteem, and satisfaction with life]*. (Unpublished diploma thesis). Zagreb: University of Zagreb.
- Nakić Radoš, S., Tadinac, M., & Herman, R. (2013b). Validation study of the Croatian version of the Edinburgh Postnatal Depression Scale (EPDS). *Suvremena psihologija*, 16(2), 203-218.
- Novković, G. (2003). *Odrednice provođenja dijete kod adolescentica [Determinants of dieting in adolescents]*. (Unpublished diploma thesis). Zagreb: University of Zagreb
- Patton, G. C., Carlin, J. B., & Shao, Q. (1997). Adolescent dieting: Healthy weight control or borderline eating disorder? *Journal of Child Psychology and Psychiatry*, 38, 299-306. doi:10.1111/j.1469-7610.1997.tb01514.x

- Phan, T., & Tylka, T. L. (2006). Exploring a model and moderators of disordered eating with Asian American college women. *Journal of Counseling Psychology*, 53(1), 36-47. doi:10.1037/0022-0167.53.1.36
- Pokrajac-Bulian, A., Mohorić, T., & Đurović, D. (2007). Odstupajuće navike hranjenja, nezadovoljstvo tijelom i učestalost provođenja dijeta kod hrvatskih srednjoškolaca [Disturbed eating habits, body dissatisfaction, and dieting frequency in Croatian secondary school students]. *Psihologijske teme*, 16, 27-46.
- Pokrajac-Bulian, A., Živčić-Bećirević, I., Vukmanović, S., & Forbes, G. (2005). Nezadovoljstvo tjelesnim izgledom i navike hranjenja kod studentica i njihovih majki [Body dissatisfaction and eating habits in college student and their mothers]. *Psihologijske teme*, 14(1), 57-70.
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Rukavina, T. (2002). *Internalizacija ideala tjelesnoga izgleda, nezadovoljstvo tijelom i simptomi poremećaja hranjenja kod adolescenata* [Thin-ideal internalization, body dissatisfaction and symptoms of eating disorders in adolescents]. (Unpublished diploma thesis). Rijeka: University of Rijeka.
- Skouteris, H., Carr, R., Wertheim, E. H., Paxton, S. J., & Duncombe, D. (2005). A prospective study of factors that lead to body dissatisfaction during pregnancy. *Body Image*, 2, 347-361. doi:10.1016/j.bodyim.2005.09.002
- Su, K.-P., Chiu, T.-H., Huang, C.-L., Ho, M., Lee, C.-C., Wu, P.-L., . . . Pariente, C. M. (2007). Different cut-off points for different trimesters? The use of Edinburgh postnatal depression scale and Beck depression inventory to screen for depression in pregnant Taiwanese women. *General Hospital Psychiatry*, 29(5), 436-441. doi:10.1016/j.eurpsy.2007.01.1074
- Szmuckler, G. (1987). Some comments on the link between anorexia nervosa and affective disorder. *International Journal of Eating Disorders*, 6, 181-189.
- Terry-Short, L. A., Owens, R. G., Slade, P. D. and Dewey, M. E. (1995). Positive and negative Perfectionism. *Personality and Individual Differences*, 18(5), 663-668. doi:10.1016/0191-8869(94)00192-U
- Tkalčić, M. (1998). *Psihoneuroimunološki aspekti bolesti alopecia areata* [Psychoneurobiological aspects of alopecia areata disease]. (Unpublished doctoral dissertation). Zagreb: Faculty of Humanities and Social Sciences, University of Zagreb.
- Trivunčić, S. (1998). *Validacija inventara poremećaja hranjenja i Skale stavova prema hranjenju* [Validation of Eating Disorder Inventory and Eating Attitude Test]. (Unpublished diploma thesis). Rijeka: University of Rijeka.
- Vulić-Prtorić, A., & Cifrek-Kolarić, M. (2011). *Istraživanja u razvojnoj psihopatologiji* [Research in developmental psychopathology]. Jastrebarsko: Naklada Slap.
- Winstead, B. A., & Cash, T. F. (1984). *Reliability and validity of the Body-Self Relations Questionnaire: A new measure of body image*. New Orleans: Southeastern Psychological Association Convention.