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Risk factors and the prevalence of anorexia nervosa among female students in Serbia

Faktori rizika i prevalencija anoreksije nervoze među studentkinjama u Srbiji

Jovana Lazarević*, Borjanka Batinić*†, Tatjana Vukosavljević-Gvozden*

***Department of Psychology, Faculty of Philosophy, University of Belgrade, Serbia;**
†Clinic of Psychiatry, Clinical Center of Serbia, Belgrade, Serbia

Abstract

Background/Aim. The widespread symptoms of anorexia nervosa (AN) in young women require to draw professional attention to this problem in Serbia. In previous research on AN, insecure attachment styles, perfectionism and concerns about body shape were identified as notable risk factors. The aim of this study was to identify the prevalence of AN among female students and assess the importance of these factors in its development. **Methods.** The Eating Attitudes Test (EAT-40), the Experiences in Close Relationships Scale (ECR), the Frost Multidimensional Perfectionism Scale (FMPS) and the Body Shape Questionnaire (BSQ) were applied to a sample of 500 randomly selected female students of the University of Belgrade, the mean age of 22.44 years (min 18, max 35). In addition, Body Mass Index (BMI) was also calculated. **Results.** Although 38 (7.6%) female students displayed symptoms of AN (EAT > 30) and 13 (2.6%) had BMI indicating anorexia nervosa syndrome (BMI ≤ 17.50 kg/m^2), only 1 (0.2%) student fulfilled both criteria. The majority of female students (60.4%) had some type of insecure attachment style. There is a significant influence of attachment styles on symptoms of AN: female students with insecure attachment styles have a significantly higher mean score on the EAT compared to those with secure attachment style ($F = 7.873$; $p < 0.01$). There was a positive correlation between scores on the EAT and FMPS ($r = 0.217$; $p < 0.01$), and scores on the EAT and BSQ ($r = 0.388$; $p < 0.01$). **Conclusions.** The obtained results show the prevalence of AN of 0.2% among female students and indicate the importance of insecure attachment styles, perfectionism and concern about body shape as risk factors. Activities for the prevention of AN in this subpopulation should include internet-based therapy and special counseling services with specific programs focusing on emotion-regulation skills through mindfulness, acceptance and commitment techniques, as well as specific cognitive-behavioral techniques.

Key words:
anorexia nervosa; risk factors; prevalence; students; women; serbia.

Apstrakt

Uvod/Cilj. Rasprostranjenost simptoma anoreksije nervoze (AN) među mladim ženama zahteva skretanje pažnje stručnjaka na ovaj problem u Srbiji. U prethodnim istraživanjima anoreksije nervoze, nesigurni stilovi afektivnog vezivanja, perfekcionizam i zabrinutost povodom oblika tela, identifikovani su kao značajni faktori rizika. Cilj ovog istraživanja bio je da se identifikuje prevalencija AN među studentkinjama i ispita značaj navedenih faktora za razvoj AN. **Metode.** Upitnik stavova o ishrani (*Eating Attitudes* Test – EAT-40), Skala iskustava u bliskim emocionalnim odnosima (*Experiences in Close Relationships Scale* –ECR), Multidimenzionalna skala perfekcionizma (*Frost Multidimensional Perfectionism Scale* – FMPS) i Upitnik doživljaja oblika tela (*Body Shape Questionnaire* – BSQ), primenjeni su na grupi od 500 studentkinja Univerziteta u Beogradu, izabranih metodom slučajnog izbora, prosečnog uzrasta 22,44 godine (min 18, max 35). Takođe, računat je i indeks telesne mase (*Body mass index* – BMI). **Rezultati.** Premda je 38 (7,6%) studentkinja ispoljavalo simptome anoreksije nervoze (EAT > 30), a 13 (2,6%) imalo indeks telesne mase koji upozorava na sindrom poremećaja (BMI ≤ 17,50 kg/m^2), samo je jedna (0,2%) studentkinja ispunjavala oba kriterijuma (EAT > 30, BMI = 15,64 kg/m^2). Većina studentkinja (60,4%) imala je neki od nesigurnih stilova afektivnog vezivanja. Postoji značajan efekat stilova afektivnog vezivanja na izraženost simptoma anoreksije nervoze: studentkinje koje imaju neki od nesigurnih stilova afektivnog vezivanja imaju značajno veći prosečni skor na upitniku EAT u poređenju sa onima sa sigurnim stilom ($F = 7,873$; $p < 0,01$). Postoji pozitivna korelacija između skorova na upitnicima EAT i FMPS ($r = 0,217$; $p < 0,01$), i EAT i BSQ ($r = 0,388$; $p < 0,01$). **Zaključak.** Prevalencija AN među studentkinjama iznosi 0,2%. Rezultati ukazuju na značaj nesigurnih stilova afektivnog vezivanja, perfekcionizma i zabrinutosti povodom oblika tela kao faktora rizika. Prevencija AN u ovoj subpopulaciji treba da se usmeri na izradu internet terapije i specijalizovanih savetovališta sa specifičnim programima usmerenim na veštine regulacije emocija tehnikama pune svesnosti, prihvatanja i posvećenosti, kao i specifičnih kognitivno-bihejvioralnih tehnika.

Ključne reči:
anoreksija nervoza; faktori rizika; prevalenca; studenti; žene; srbija.

Correspondence to: Jovana Lazarević, Velizara Stankovića 4/40, 11 000 Belgrade, Serbia. Phone: +381 11 405 8175.
E-mail: jocal88@yahoo.com

Introduction

Over the recent years, an increasing number of women have been involved in intense exercise and various forms of strict diets. It is estimated that 8–17% of young women show some symptoms of eating disorders [1]. Among undergraduate female students the prevalence of symptoms of eating disorder is 13.5% [2]. Twenty percent of female students at some time in their life have eating disorder, 75% avoid or skip meals while dieting, while 55% know at least one person with eating disorder [3].

Anorexia nervosa (AN) is one of the most common psychiatric disorders among female students [4]. Around the world the prevalence of AN among women is 0.5–1.0% (APA, 2000) [5]. The prevalence of this disorder is 0.5% in the Hungarian sample and 0.2% in the Romanian sample of young women. For subclinical symptoms of AN, the rate in the Hungarian female sample was 1.1 %, and in the Romanian female sample 3.0% [6]. For an explanation of the development of AN, a multidimensional biopsychosocial model that emphasizes the importance of a large number of factors is generally used [7].

A connection between risk factors and symptoms of AN among women who do not have the diagnosis but who express some symptoms of the disorder have been studied in many countries, finding a positive correlation between symptoms of AN and insecure attachment styles, perfectionism and body shape concerns.

Insecure attachment styles represent a general risk factor for the development of AN [8]. There is a positive correlation between insecure attachment styles and AN [9–11]. Generally, patients with AN have a significantly higher prevalence of preoccupied and dismissing attachment styles [11, 12], and significantly lower prevalence of secure attachment styles [13], compared with the control group. In women from non-clinical populations, insecure attachment styles are correlated with higher weight occupancy, body dissatisfaction and attitudes characteristic of eating disorders [14]. While secure attachment style correlates negatively, preoccupied and dismissing attachment styles correlate positively with symptoms of AN in female students [15].

Perfectionism has been identified as a potential risk factor for developing AN, too [16, 17] and represents a discriminative characteristic of the disorder. Patients with AN have significantly higher levels of perfectionism than healthy individuals [18]. They usually have unrealistic standards on physical attractiveness and thinness [19] and interpret normal drawbacks as too upsetting or normal body and body parts characteristics as a sign of imperfection [20]. There is a statistically significant correlation between the different dimensions of perfectionism and symptoms of dysfunctional eating attitudes and behaviour, especially in female students who are preoccupied with exercise and dieting [20, 21].

Weight and appearance concerns, body dissatisfaction, negative self-image and dieting represent significant predictors of eating disorders [22–24]. Body shape is an important feature of body image and body dissatisfaction [25]. Numerous studies have shown a strong correlation between eating disorders and anxiety and preoccupation with body shape [26]. There is a positive correlation between concerns about body shape and pathological eating attitudes and behaviors in female students [25, 27, 28]. Up to 90% of female students are dissatisfied with their appearance and concerned about body shape [29]. There is also a positive correlation ($r = 0.393$) between perfectionism and concerns about body shape ($p < 0.01$) among 45 Serbian female students with dysfunctional eating attitudes and behavior [30].

Eating disorder symptoms may develop in vulnerable young women as a response to life stressors or traumatic events, serving as strategies for coping with overwhelming emotions or circumstances. The problems of a country-in-transition could affect the family through a family discord which can be associated with insecure attachment styles. Then, during their student life, young women in Serbia may experience high levels of stress, primarily due to financial uncertainty and academic competence. They are exposed to parents' high expectations and set themselves high standards, which are sometimes perfectionistic. They also may experience feelings of isolation and intense peer pressure, fear of teasing and mistakes, and of negative assessment by others. Further, they are exposed to unrealistic media images and cultural pressure that women should be slim and good-looking. Therefore, concern about body shape is common.

The aim of this study was to examine the prevalence of the symptoms of AN among female students in Serbia, as well as the relationship between the symptoms of AN and attachment styles, perfectionism and concerns about body shape. These factors, among others, can contribute to the development of the symptoms and syndrome of AN among the population of female students.

Methods

Participants and procedure

A total of 500 randomly selected female students (n = 500) of the University of Belgrade participated in this study. A sample consisted of female students from different faculties, all undertaking undergraduate and postgraduate studies. All fully completed questionnaires were included in the study, regardless the age of the female students. The mean age of the students was 22.44 years (min 18, max 35). The majority (92.8%) of female students were aged between 20 and 25. Testing was conducted at the faculties and in the campus of the University in New Belgrade. Research was conducted with the approval of competent institutions. The participants were given information about research topic and purpose, and their participation was voluntary. They were given a package of 4 questionnaires, and after completion collected. The average time for completing questionnaires was 30 minutes.

Instruments

Eating Attitude Test – EAT [31]. This questionnaire evaluates attitudes, behaviors and traits characteristic of AN and disturbed and extreme eating patterns in the non-clinical population. It is a useful instrument to identify current or initial

cases of anorexia nervosa in the population without diagnosis. It consists of 40 Likert-type statements where respondents indicate their level of agreement with each statement expressed on a 6-point scale: 1 = always, 2 = very often, 3 = often, 4 = sometimes, 5 = rarely, 6 = never. The total score can range from 0 to 120 – a score greater than 30 indicates a preoccupation with food and weight and an increased risk of developing anorexia nervosa. The average score for the control sample of healthy women was 15.6, and for the anorexic patients 58.9. The EAT, applied on our sample, had good internal consistency ($\alpha = 0.83$).

The female students also indicated their height and weight for calculation of body mass index (BMI), an indicator of nutritional status, but also warning of anorexia nervosa syndrome if BMI ≤ 17.5 kg/m^2.

Experiences with the Close Relationships Scale – ECR [32]. This questionnaire examines patterns of emotional ties in adult intimate relationships and is based on a two-dimensional model of individual differences in adult affective bonding – anxiety and avoidance dimensions. Anxiety scale assesses preoccupation and fear of abandonment, and avoidance scale assesses fear of intimacy and discomfort in close relationships with others. These two dimensions thus give four attachment styles: secure, dismissing, preoccupied and fearful. The questionnaire consists of 36 Likert-type statements where respondents indicate their level of agreement with each statement expressed on a 7-point scale: 1 = strongly disagree, 2 = disagree, 3 = partially disagree, 4 = not sure, 5 = partially agree, 6 = agree, 7 = strongly agree. The ECR, applied on our sample, had good internal consistency ($\alpha = 0.89$), with scores on the subscales ranging from 0.84 to 0.89.

Frost Multidimensional Perfectionism Scale – FMPS [33]. This questionnaire assesses the severity of perfectionism. It includes six dimensions of perfectionism: Concern over Mistakes (CM) – negative reactions to mistakes that are considered to be a failure; Personal Standards (PS) – set extremely high standards as criteria of self-evaluation; Parental Expectations (PE) – the belief that parents set high standards and have high expectations; Parental Criticism (PC) – perception of parents as being too condemnatory-minded; Doubts about actions (D) – doubt their abilities and performance; Organization (O) – over-emphasizing the importance of order and tidiness. The questionnaire consists of 35 Likert-type statements and respondents indicate their level of agreement with each statement expressed on a 5-point scale: 1 = completely false, 2 = false, 3 = neither true nor false, 4 = true, 5 = completely true. The total score is the sum of all points and is in the range from 35 to 175. FMPS, applied to our sample, had good internal consistency ($\alpha = 0.88$).

Body Shape Questionnaire – BSQ [34]. This questionnaire measures concern about body shape, especially the experience of the phenomenon of "feeling fat", and refers to the condition of the respondents in the previous four weeks. It consists of 34 Likert-type statements, and respondents indicate their level of agreement with each statement expressed on a 6-point scale: 1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = very often, 6 = always. The total score is the sum of points obtained in all claims to the test and is in the range of between 34 and 204. Scores can be classified in 4 categories: not worried about body shape < 81, slightly worried = 81–110, moderately worried = 111–140, extremely worried > 140. The average score for the non-clinical population is 71.9, and for people with eating disorders 136.9. The BSQ has not been used before in Serbia, so a pilot study was conducted on a sample of 50 students of the Faculty of Philosophy, showing good internal consistency ($\alpha = 0.96$). The use of the questionnaire was granted by permission of Prof. Peter Cooper.

Statistical analysis of the data

The collected data were statistically analyzed using SPSS. Descriptive statistics of the obtained data was conducted for all instruments (EAT, ECR, FMPS, BSQ) applied in this study and for the obtained BMI. In order to determine if there was a significant difference in the mean BMI between the female students with symptoms of AN and those who did not display the symptoms, we used the Student *t*-test. The correlations between the symptoms of AN and BMI was examined using correlation analysis. The χ^2-test was used in order to determine if there is a significant difference in the frequency of attachment styles between female students with symptoms of AN and those who do not display such symptoms. A correlation between symptoms of anorexia nervosa and attachment styles was examined using univariate analysis of variance. The correlations between symptoms of AN and perfectionism and body shape concerns were examined using correlation analysis. Multiple regression analysis was used to determine whether we could predict symptoms of AN by the subscales of anxiety and avoidance, perfectionism and concerns about body shape.

Results

Descriptive statistic (Table 1) showed that 38 (7.6%) female students had symptoms of AN according to the cut-off score on EAT (EAT > 30).

According to the BSQ score [34], 358 (71.6%) female students could be considered as not worried about body shape, 87 (17.4%) as slightly worried, 43 (8.6%) as moderately worried and 12 (2.4%) as extremely worried.

Table 2 shows descriptive statistics of BMI for the entire sample (n = 500) and for the subsample of female students with symptoms of AN (n = 38). In the entire sample and in the subsample of female students with symptoms of AN, minimal calculated weight belongs to the category of underweight, while mean weights belong to the category of optimal weight. For the entire sample, the maximum calculated weight belongs to the category of obese class III, while in the subsample with symptoms of AN the maximum calculated weight belongs to the category of overweight.

Based on scores on the EAT and BMI, one (0.2%) female student met both criteria for the diagnosis of AN (EAT > 30; BMI ≤ 17.50 kg/m^2). Three (0.6%) female students were preoccupied and worried about weight and food

Table 1

Minimal, maximal, mean and standard deviation of the data from the Eating Attitude Test (EAT), Experience in Close Relationship (ECR), Frost Multidimensional Perfectionism (FMPS) and Body Shape Questionnaire (BSQ) obtained from the entire sample (n = 500)

Test/Scale	Min	Max	$\bar{x}$	SD	n
EAT	2	87	14.81	10.975	500
ECR anxiety	1	6	2.76	0.987	500
ECR avoidance	1	6	3.11	0.789	500
FMPS	59	154	98.14	15.147	500
BSQ	34	178	70.53	28.436	500

Table 2

Minimal, maximal, mean and standard deviation of body mass index (BMI) for the entire sample (n = 500) and for the subsample of those female students who manifest symptoms of anorexia nervosa (n = 38), and the results of *t*-test for the average of BMI of these two groups of female students

Questionnaire	BMI, kg/m^2						
	min	max	$\bar{x}$	SD	n	*t*-test	*p*
EAT	15.64	54.50	20.84	2.869	500	-1.449	> 0.14
EAT > 30	15.64	29.38	21.48	2.814	38		

EAT = Eating Attitude Test; EAT > 30 = scores that are on EAT scale greater than 30.

(EAT > 30), and belonged to the category of underweight, and thus they were at high risk for developing AN.

Although there might have been expected to be a negative correlation, we did not find statistically significant correlation between scores on the EAT and BMI ($r = 0.067$; $p > 0.13$) on the whole sample (n = 500), as well as on the subsample ($r = 0.028$; $p > 0.86$; n = 38).

In order to identify female students who met the second criterion for AN syndrome, we calculated BMI proposed by the World Health Organization (WHO) in 1995, for those with symptoms of AN (n = 38) according to the cut-off score on EAT (Table 3). Among female students with symptoms of AN on EAT (n = 38), most of them belonged to the category of optimal weight, while the same number of them belonged to the category of underweight and overweight.

Based on scores on dimensions of anxiety and avoidance [32], attachment style for every participant was determined. Using a logarithmic equation, by crossing subscales of anxiety and avoidance, it was determined which attachment style is characteristic for each respondent in the sample. Secure attachment style was characterized by achievement of low scores on both subscales (anxiety and avoidance), while fearful attachment style was characterized by achievement of high scores on both subscales. Preoccupied attachment style was characterized by achieving of high scores on the anxiety subscale and low scores on the avoidance subscale. Dismissing attachment style was characterized by achieving low scores on the anxiety subscale and high scores on the avoidance subscale. The frequency and percentages of attachment styles for the entire sample (n = 500) and for the subsample of female students with symptoms of AN (n = 38). The majority of the respondents were characterized by some insecure attachment style (60.4%), while the secure attachment style was less represented than might be expected given that it was a non-clinical population. In the subsample of 38 female students with symptoms of AN (EAT > 30), the insecure attachment style dominated (81.6%), with the most prevalent fearful and dismissing style, while significantly less prevalent was the secure attachment style (Table 4).

In order to determine if there was a significant difference in the frequency of the attachment styles between the female students with the symptoms of AN (n = 38) and those who did not display them, (n = 462), we used the χ^2-test. There was a statistically significant difference in the

Table 3

Category of body mass index (BMI) in the subsample of female students with symptoms of anorexia nervosa (n = 38)

Questionnaire	Categories of body mass index (BMI), kg/m^2						
	≤ 17.50	< 18.50	18.50–24.99	25.00–29.99	30.00–34.99	35.00–39.99	≥ 40
EAT > 30	1	4	30	4	0	0	0

EAT > 30 = scores that are on Eating Attitude Test greater than 30.

Table 4

Prevalence and frequency of attachment styles for the entire sample (n = 500) and for the subsample of those female students who manifest symptoms of anorexia nervosa (n = 38)

Questionnaire	Attachment styles				n
	Secure	Fearful	Preoccupied	Dismissing	
EAT, n (%)	198 (39.6)	102 (20.4)	32 (6.4)	168 (33.6)	500
EAT > 30, n (%)	7 (18.4)	16 (42.1)	3 (7.9)	12 (31.6)	38

EAT – Eating Attitude Test; EAT > 30 – scores that are on Eating Attitude Test greater than 30.

frequency of categories of attachment styles between the female students who displayed and those who did not display the symptoms of AN (Pearson $\chi^2 = 14.349$; $p < 0.001$; $\bar{x} = 1.07$; SD = 0.265).

Univariate analysis of variance was used to examine the relationship between EAT scores and attachment styles. The female students with secure attachment style had the lowest average score on EAT, while those with some insecure attachment styles had higher mean scores, with the highest value in the female students with preoccupied attachment style (Table 5).

There is a significant difference in mean scores on the EAT between the female students with secure, fearful, preoccupied and dismissing attachment style. Univariate analysis of variance indicated that scores on the EAT were significantly correlated with attachment styles (F = 7.873; $p < 0.001$; df = 3;496). Eta coefficient was 0.202 and indicated was a significant prediction of symptoms of anorexia nervosa based on attachment styles in the amount of 4.1%, respectively these were explained variance scores on the EAT, based on attachment style. There was a statistically significant effect of the attachment styles on severity of symptoms of AN. Scores on Eating attitudes test were significantly different between the groups of female students with secure, fearful, preoccupied and dismissive attachment styles. In order to determine whether there was a significant difference in scores on the Eating Attitude Test between the female students with secure attachment style and the female students with some insecure attachment styles, we used one of the *post hock* tests, analysis of contrast. Based on the results obtained, we could conclude that there was a significant difference in mean scores on the EAT between the female students with secure and fearful attachment styles (value of contrast = 0.1412; $p < 0.001$; df = 496), those with secure and preoccupied attachment styles (value of contrast = 0.1548; $p < 0.003$; df = 496) and those with secure and dismissing attachment styles (value of contrast = 0.0591; $p < 0.036$; df = 496).

Correlation analysis was used to examine the relationship between EAT scores and perfectionism (Table 6). The female students with higher scores on the FMPS achieved higher scores on the EAT. From the six dimensions of perfectionism, four were significantly positively correlated with scores EAT: Concern over mistake, Personal standards, Parental expectations and Doubts about actions. All the correlations were positive and statistically significant. The female students with higher perfectionism expressed a tendency to have unhealthier eating attitudes.

Correlation analysis was used to examine the relationship between scores on the EAT and total scores on the BSQ. Pearson's correlation coefficient ($r = 0.388$; $p < 0.001$) indicated a significant positive correlation between symptoms of anorexia nervosa and concern about body shape. The female students with higher scores on the BSQ achieved higher scores on the EAT.

Multiple regression analysis was used to determine whether we could predict symptoms of AN by subscales of anxiety and avoidance, perfectionism and concerns about body shape. It indicated a significant linear correlation between a set of predictor variables – subscales of anxiety and avoidance, perfectionism and concerns about body shape, and the criterion variable – symptoms of AN (R = 0.409; $p < 0.001$; std. error = 10.056). There was a significant prediction of symptoms of AN based on scores on the subscale of anxiety and avoidance, perfectionism and body shape perception in the amount of 16.8%.

Table 7 shows beta coefficients of the subscales of anxiety and avoidance, perfectionism and concern about body shape as predictors of symptoms of AN.

The results shown in Table 7 indicate that the subscale of avoidance [32], perfectionism [33] and concern about body shape [34] are significant predictors of symptoms of AN. All the three beta coefficients had a positive sign, which indi-

Table 5

Minimal, maximal, mean and standard deviation of EAT scores and attachment styles for the entire sample (n = 500)

Attachment styles	EAT				
	min	max	$\bar{x}$	SD	n
Secure	2	59	12.40	7.782	198
Fearful	2	73	17.90	12.628	102
Preoccupied	6	87	18.13	14.940	32
Dismissing	2	81	15.13	11.649	168

EAT – Eating Attitude Test.

Table 6

Correlations between scores on the EAT and scores on the FMPS for the entire sample (n = 500)

Questionnaire	FMPS	CM	PS	PE	PC	D	O
EAT	0.217**	0.229**	0.195**	0.120**	0.070	0.111*	0.035

EAT – Eating Attitude Test; FMPS – Frost Multidimensional Perfectionism Scale; CM – Concern over Mistakes; PS – Personal Standards; PE – Parental Expectations; PC – Parental Criticism; D – doubts about actions; O – organization; ***Correlation significant at the level of 0.05; ****Correlation significant at the level of 0.01.**

Table 7

Beta coefficients of subscales of anxiety and avoidance, perfectionism and concern about body shape as predictors of symptoms of anorexia nervosa as predictors of symptoms of anorexia nervosa

Predictors	Beta coefficients	Significance	Correlation	Partial correlation
Subscale of anxiety of ECR	-0.004	0.935	0.202	-0.004
Subscale of avoidance of ECR	0.087	0.049*	0.181	0.088
Perfectionism	0.100	0.033*	0.217	0.096
Concern about body shape	0.338	0.000**	0.388	0.317

ECR – Experience in Close Relationship; *Correlation significant at the level 0.05; **Correlation significant at the level of 0.01.

cated that female students with higher scores on the subscale of avoidance, Multidimensional Perfectionism Scale and Body Shape Questionnaire, had higher scores on the Eating Attitudes Test.

Discussion

The mean score for all the female students (n = 500) on the EAT is as expected, compared to an average score for the non-clinical population of 15.6 [31]. The prevalence of female students with symptoms of AN is smaller than findings of other authors – 20% [3] and some results obtained in a similar study [4]. An average result on the FMPS on the student population is higher than results obtained among the American population [33]. The mean score on the BSQ is as expected, compared with the average score for the non-clinical population of 71.9 [34]. Average results on dimensions of ECR are very close to the results on the original sample [32].

The female students with secure attachment style had the lowest average score on the EAT. In the female students who reached the result on EAT above criteria for the diagnosis of AN (n = 38), insecure attachment styles predominated (81.6%), with fearful attachment style (42.1%) as dominant. Our results are in accordance with the data that secure attachment style represented significantly lower in the sample of female students with AN [13] and that insecure attachment styles associated with more severe symptoms of AN [11, 14, 15]. Yet, while some authors report that among women with symptoms of AN the most prevalent are preoccupied and dismissing attachment styles [11, 12], in our sample the most prevalent was the fearful attachment style.

Anorexia nervosa could be, as other self-disorders, the result of chronic parental difficulty in establishing and maintaining an empathic relationship with the child [8]. Disturbed behavior patterns characteristic of eating disorders may occur as a result of failure to develop secure relationships that form the basis of self-regulation and allow a person to gain support [35]. The emphasis is on the failure of development of autonomy, the lack of differentiation in relation to the mother and the search for control that occurs as a result of inability to cope with separation and individualization in adolescence [36]. The period of economic and cultural transition in Serbia might be a reason for the parents, as the figures of attachment, to exhibit high levels of stress, dysfunctional interactions, aggression and denial of the emotional needs of the child, but also the tendency to overprotect the child. These factors may be associated with insecure attachment styles, which are risk factors of anorexia nervosa. Negative self-image can affect the attitudes of a person to achieve a certain standard of beauty and attractive physical appearance and to gain a sense of security and control. Therefore, maladaptive attitudes related to nutrition often represent an attempt to achieve safety and self-esteem in the area where it may seem easiest to gain control over their lives. Furthermore, the lack of self-esteem and self-confidence and lack of confidence in other people can contribute to that person seeking to overcome emotional problems through dysfunctional eating behaviour and attitudes.

The results of this study indicate that more pronounced perfectionism is associated with higher expressed symptoms of AN. As the sample of this study consisted of female students, our results support other similar findings that perfectionism presents a potential risk factor for developing AN [16–18]. Based on this positive correlation between perfectionism and symptoms of AN, we can further assume that perfectionism influence setting unrealistic standards about physical appearance [19, 20]. We found that symptoms of AN were significantly correlated with dimensions of maladaptive perfectionism – concern over mistakes, parental expectations and doubts about actions. It should be noted that the dimension of adaptive perfectionism – personal standards – is also positively associated with symptoms of AN. These results were expected, as other authors already found different correlation between symptoms of dysfunctional eating attitudes and behavior and different dimensions of perfectionism [20, 21].

During student life, young women in Serbia are exposed to many pressures, high expectations, and adapting to a competitive atmosphere. Therefore, female students, influenced by the high standards set in society and the expectations that parents often impose, may develop unrealistic standards for themselves, which are sometimes perfectionistic. Setting very high and inflexible targets is associated with similar behaviour in the area of body image and weight. If they are very strict on themselves, they may exhibit these characteristics in order to achieve their goals in the area of physical attractiveness and to reach their desired weight.

A positive correlation between scores on the EAT and those on the BSQ was expected because many studies reported the same findings [27–29]. Female students who are more dissatisfied with their appearance and more worried about their body shape exhibit more symptoms of AN. Many authors already found that negative self-image represents a po-

tential risk factor for developing AN [22–24]. The results of our study are consistent with these findings, considering that female students who were not concerned about body shape had the lowest average score on the EAT, while those who were extremely worried about body shape had the highest average score on the EAT. Although Lowery et al. [29] find that 90% of female students are concerned about body shape, in our sample that number is much smaller (28.3%), which deserves further research in order to explain such discrepancy.

There is a cultural pressure that women should be slim. The mass media promotes slimness as a symbol of beauty and success – women represented in the media are generally thin which is associated with the ideals of attractiveness and the importance of physical appearance of success. Social comparison with others influences susceptibility to the imposed values in society. Also, there are many commercials on television and articles in women's magazines that are dedicated to effective weight loss. The ideals of thinness are promoted by peers too, and those who seek to depart from such ideals are often subject to teasing. All the above mentioned factors often affect dissatisfaction with the appearance of young women. Further, they can affect the development of maladaptive attitudes and habits regarding diet in order to achieve these ideals.

In order to prevent symptoms and syndrome of AN in female students, it would be useful to organize lectures about eating disorders and educational workshops at universities in Serbia. Taking into account that some female students could be embarrassed to talk openly about their problems, it would be useful to create a website where they can find useful information about AN and professional help through internet-based therapy. The most important goal would be creation and development of specialized counseling services, where young women could find help to cope with problems of anorexia nervosa and eating disorders in general. Specific programs should be focused on enhancing emotion regulation skills, including mindfulness and acceptance and commitment techniques, as well as special tailored forms of cognitive-behavioral techniques for enhancing more realistic, logic and useful attitudes towards eating, body image, themselves in general, others and their surroundings.

Limitations of the study

This study has some limitations, such as non-systematic measurement of respondents' height and weight. Also, although we know that external factors, such as influence of the family, friends, mass media and culture values and pressures are also very important risk factors for developing AN, our study was focused only on internal contributing factors. Further, the obtained findings are applicable to the female students' population and for better understanding AN, it is necessary to conduct research in a heterogeneous or clinical sample. Nevertheless, our results obtained on 500 female students of the University of Belgrade, provide a reliable basis for further research and efforts for improving treatment and prevention of AN symptoms and syndrome.

Conclusion

The majority of female students have a certain form of insecure attachment style. Those students with insecure attachment style and with higher perfectionism exhibit more dysfunctional attitudes and unhealthier behavior towards food. Furthermore, female students who are concerned about body shape manifest more symptoms characteristic of anorexia nervosa. The prevalence of anorexia nervosa was 0.2%, but the symptoms of anorexia nervosa were more frequent and should not be underestimated.

Disturbed eating attitudes and behavior and insecure attachment styles, perfectionism and body shape concerns were identified as risk factors for anorexia nervosa among female students, and may serve as an important basis for targeted interventions in the prevention and treatment of anorexia nervosa in this subpopulation.

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