# Adolescents Eating Behavior, Body Image and Psychological Well-Being

#### Lana Peternel and Anita Sujoldžić

Institute for Anthropological Research, Zagreb, Croatia

#### ABSTRACT

This study focuses on the middle school students in the Croatian region of Dalmatia. The survey was designed to examine adolescent eating behavior as it relates to body image and psychological well-being (self-esteem, life-satisfaction and stress) in relation to body mass index; BMI. Differences among participants in food intake were examined according to demographic variables and eating behavior (regular food intake or dieting) as well. Psychological variables were highly associated with dieting among adolescents of both genders. The adolescents who were dieting reported significantly lower self-esteem, lower life satisfaction and lower body-image satisfaction, higher rate of stress and higher rate of body mass index (BMI) when compared to non-dieters. This study confirms that a rather large percentage of adolescent girls of low socioeconomic status engage in dieting when trying to lose weight, which may seriously damage their developmental growth.

Key words: anthropology, eating behavior, adolescents, dieting, body-image, well-being

## Introduction

Adolescence is one of the most dynamic and complex transitions in the lifespan with developmental physical, psychological and social changes that can markedly affect dietary habits and psychological functioning<sup>1</sup>. Physical changes, including rapid growth and increase in the percentage of body fat and muscle mass, place additional nutritional requirements on adolescents<sup>2</sup>. Studies have consistently shown that adolescents, as a population group, have, in general, poor eating habits that do not meet current dietary recommendations<sup>3</sup>. Among adolescents fast food is much more popular than the so called traditional food. At the same time, dieting is also rather frequent in this age group<sup>4,5</sup>.

Dieting entails replacing internally regulated (hunger-driven) eating with planned, cognitively determined, diet-approved eating, or dietary restraint<sup>3</sup>. The restrained eater must ignore internal signals of hunger (and satiety) to adhere to a calorically reduced eating plan that will presumably lead to weight loss. Unfortunately, ignoring internal hunger signals often results in the disruption of normal caloric regulation and it may result in inadequate nutrient intake during critical periods of development and growth<sup>6,7</sup>.

Dieting behavior is considered to develop under the influence of social and cultural standards that promote a marked slimness, in which fatness is absolutely unacceptable<sup>8</sup>. In the Western culture, thinness has come to symbolize competence, success, control, and sexual attractiveness while obesity represents laziness, self-indulgence and lack of willpower<sup>9,10</sup>. Restrained eaters or dieters exhibit personality traits of body image dissatisfaction, low self-esteem, lack of internal sensitivity or awareness, increased compliance and heightened emotionality<sup>7–10</sup>. Given these current unrealistic societal and cultural ideals, many adolescents, especially girls and young women, even of normal weight, experience discontent with their weight and body-shape<sup>9,10</sup>.

Because of rapid physical changes adolescents in search for their identity become focused on physical appearance and any deviation from the »ideal figure« can result in social withdrawal and poor psychological functioning<sup>11</sup>. Culturally bound and consensually validated definitions of what is desirable and attractive play an important role in the body image formation. Because of the high value the Western society places upon appearance, self-worth is enhanced for those who are judged attractive and is chal-

lenged for those who are deemed unattractive<sup>12</sup>. Attractiveness is related to self-acceptance for both men and women, but attractiveness and body attitudes are a more salient component of self-concept for woman than for men<sup>1,4</sup>.

By adolescence, especially girls are more concerned with their looks than boys, and they also perceive themselves to be less attractive than boys do<sup>4</sup>. In previous studies girls who perceived themselves to be less attractive had lower self-worth scores then did girls who were more satisfied with their appearance<sup>12</sup>. Considering all demonstrated facts obtained in previous researches, a positive relationship between eating behavior and disturbed psychological functioning has been proven<sup>1–5</sup>. The results on various forms of eating behavior disturbances imply that social, cultural and psychological characteristics play a more important role than it used to be thought before<sup>1,4,5</sup>.

#### **Aims**

Taking into consideration the results from past research studies, this study is an attempt to examine the roles of different factors (social and psychological) in changing regular food intake among Croatian youth.

Specific aims were:

- Assessing body mass index (BMI) according to the gender, place of living (Split or the Island of Hvar) and socioeconomic status.
- 2. Investigating different factors, such as socioeconomic status and gender, giving rise to dieting in adolescence.
- 3. Evaluating the direct influence of psychological well-being on dieting behavior in adolescent population.

Using the psychological variables, such as measures of stress, life satisfaction, and self-esteem, reflecting psychological well-being and body-image perception three hypotheses concerning dieting behavior were investigated.

It was hypothesized that:

- Female adolescents would exhibit higher levels of dieting behavior and lower levels of body image satisfaction than male adolescents.
- Socioeconomic status plays an important role in the emergence of dieting. Adolescents of lower socioeconomic status will demonstrate higher rates of dieting behavior.
- Adolescents who demonstrated higher rates of dieting behavior will have higher levels of psychological distress and a lower level of life satisfaction and self-esteem.

# Sample

Participants in this study were recruited from high schools on the Island of Hvar and in the town of Split, in Central Dalmatia, Croatia. The total sample size was 507 high- school students, – 234 (43.2%) males and 273 (53.8%) females (Table 1). There were no statistically significant differences in the distribution according to place of residence (p=0.469) according to the results of the chi-square  $\chi^2$  test and participants' ages ranged from 15 to 18, with a mean age of 16.38 years (Table 1). The socioeconomic conditions of the participants were reasonably diverse, although middle-class adolescents prevailed.

 ${\color{blue} \textbf{TABLE 1}} \\ \textbf{SAMPLE DISTRIBUTION ACCORDING TO PLACE OF RESIDENCE AND GENDER AND DISTRIBUTION OF AGE } \\$ 

Age		HVAR		SPLIT		m . 1
	-	M	F	M	F	Total
	N	33	36	16	19	104
15	hp	47.8%	52.2%	45.7%	54.3%	100.0%
	vp	24.6%	21.8%	16.0%	17.6%	20.5%
	N	39	48	57	54	198
16	hp	44.8%	55.2%	51.4%	48.6%	100.0%
	vp	29.1%	29.1%	57.0%	50.0%	39.1%
17	N	38	46	16	13	113
	hp	45.2%	54.8%	55.2%	44.8%	100.0%
	vp	28.4%	27.9%	16.0%	12.0%	22.3%
18	N	24	35	11	22	92
	hp	40.7%	59.3%	33.3%	66.7%	100.0%
	vp	17.9%	21.2%	11.0%	20.4%	18.1%
Total	N	134	165	100	108	507
	hp	44.8%	55.2%	48.1%	51.9%	100.0%
	vp	100.0%	100.0%	100.0%	100.0%	100.0%

hp = horizontal percent

vp = vertical percent

#### **Methods**

All the participants completed a survey, i.e. structured questionnaire, which contained the following measures:

- a) Demographic background information included gender, age, place of residence and socioeconomic conditions. All measured variables were analyzed and estimated by descriptive statistical methods, independent-samples t-test, Spearman correlation analysis, discriminant analysis and the logistic regression model.
- b) Anthropometric measurements of height and weight taken from all participants were used to calculate the body mass index (BMI). As a standard measure of participant's body size, the BMI was calculated using the following formula: weight in kilograms divided by height in square meters. Cutoff points in our study are statistically determined as underweight under the 5<sup>th</sup> percentile and as overweight above the 85<sup>th</sup> percentile. The normal BMI is determined as the range between 10<sup>th</sup> to 85<sup>th</sup> percentiles<sup>13</sup>.
- c) Food preferences scale: consisted of 28 items divided into ten subscales that measured preferences among general food categories such as fruits and vegetables, milk products, meat, pasta, fat, sweets, fast food, tee and coffee, alcohol and Mediterranean food. Mediterranean food category consists of several traditional nutritional items such as fish, olive oil and regional green vegetables such as Swiss chard and cabbage. Chronbach's alpha for the sample of Croatian adolescents was 8784. The food preferences scale was developed at the Institute for Anthropological Research, Zagreb by including and adapting items from other existing sources<sup>14</sup>.
- d) Dieting behavior item is related to the intake of especially calorically reduced food or fasting aimed at losing weight <sup>14</sup>. The respondent has to answer on a dichotomous scale whether he or she practices dieting behavior or not.
- e) Body image (or body satisfaction scale) as a psychological variable is classically defined as "the picture of our own body that we form in our mind" or "the way in which the body appears to ourselves". The Body image scale consisted of two items measuring perception of body image in terms of appearance and weight. The two items were rated on a six-point Likert scale depending on the extent to which specific states are experienced. The items were summed up and averaged to obtain the following dichotomous score: dissatisfied or satisfied with body image.
- f) Psychological well-being consists of several psychological variables that reflect personal self-esteem (or self-worth), life satisfaction and level of psychological stress. The Rosenberg's self-esteem scale, a widely used measure with acceptable reliability and validity, was applied to measure self-esteem<sup>15</sup>. The scale consists of nine items measuring individual self-esteem and self-worth<sup>15</sup>. The items are answered on a five point Likert scale ranging from "strongly disagree" to "strongly agree". The lowest possible score is 9, indicating very low self-esteem,

- whereas the highest possible score is 45, indicating very high self-esteem. The test demonstrated a high degree of internal reliability in this sample, internal reliability was high  $(\alpha = .88)$ .
- g) Life satisfaction is purely subjective as it is measured on an individual basis, differing in each person. The Satisfaction with life scale (SWLS) measures life satisfaction as a cognitive-judgmental process<sup>16</sup>. It assesses an individual's conscious evaluative judgment of his/her life by using the person's own criteria<sup>16</sup>. Five items are answered on a five point Likert scale ranging from one point for »strongly disagree« to five points for »strongly agree«. The lowest possible score is 5, indicating very low life satisfaction, whereas the highest possible score is 25, indicating very high life satisfaction. Chronbach's alpha for the sample of Croatian adolescents was.77. The items were summed up and averaged to obtain the following dichotomous score: dissatisfied or satisfied with life.
- h) The overall index of *psychological stress* was calculated using the scale consisting of 26 items divided into three subscales that measured somatic symptoms, anxiety and depression<sup>17</sup>. The items are rated on a five-point Likert scale ranging from one »almost never« to five »most of the time« depending on the extent to which specific states are experienced. The scale ranges from 26 to 130, with 130 indicating the highest score possible for total stress. Chronbach's alpha for the sample of Croatian adolescents was.89. The stress screening scale was developed at the Institute for Anthropological Research, Zagreb by including and adapting items from other existing sources<sup>17</sup>.

In the last set of statistical multivariate analyses our aim was to explore the interactive effects of psychological variables on dieting by means of a logistic regression model.

## Results

The first part of the results focuses on the descriptive statistical analysis and the results of the chi-square  $(\chi^2)$ test. In the analysis of the BMI according to the demographic characteristics of adolescents we used three categories: underweight (up to 5th percentile), normal (between 10<sup>th</sup> and 85<sup>th</sup> percentile) and overweight, (over 85<sup>th</sup> percentile)<sup>2</sup>. In analyzing the body mass index BMI, no statistically significant difference was found between genders (p=0.646) (Figure 1) nor between participants according to place of living (p=0.565) (Figure 2) or socioeconomic status (p=0.372) (Figure 3) obtained by the  $\chi^2$ test. The BMI's of the participants were reasonably diverse, although the normal BMI's prevailed. But 21.2% of boys and 18.9% of girls are classified as overweight, which is a much higher percentage than it would be expected<sup>2,6</sup> (Figure 1). Some tendencies are recognized among adolescents according to their place of living, where a higher percentage of them in Split are overweight, compared to adolescents on the Island of Hvar (Figure 2). On the other hand, there is a slight difference between adolescents according to their socioeconomic

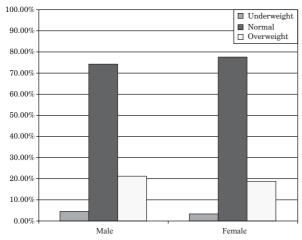


Fig. 1. Body mass index (BMI) distribution by gender.

status, with adolescents of high socioeconomic status being frequently more overweight than adolescents of moderate or low socioeconomic status (Figure 3). The results of the nutritional behavior confirmed that 14.4% or 73 participants demonstrated dieting behavior, 20.6% of girls and 7.4% of boys (Figure 4). According to the respondents' gender, there was a statistically significant difference (p<0.001) between girls and boys as far as dieting is concerned obtained by the  $\chi^2$  test. As we hypothesized, female adolescents exhibited dieting behavior more frequently. A statistically significant difference was also found with regard to dieting and socioeconomic status. According to the  $\chi^2$  test, there is a significant statistical difference among male adolescents (p=0.044) (Figure 5), as well as among the female adolescents (p=0.050) (Figure 6) of low socioeconomic status. Adolescents of both genders who are dieting are more frequently of lower socioeconomic status than adolescents with regular food intake. According to the results of similar research, adolescent dieting behavior is a risk factor for eating disorders such as anorexia nervosa and bulimia nervosa that most often afflict girls<sup>18</sup>. While anorexia

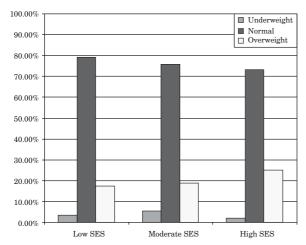


Fig. 3. Body mass index (BMI) distribution by socioeconomic status.

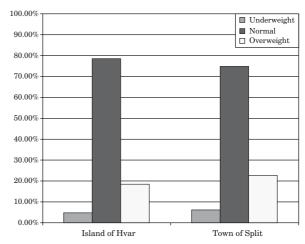


Fig. 2. Body mass index (BMI) distribution by place of living.

and bulimia nervosa most often afflict females from privileged backgrounds, results in our study confirmed that dieting is a major risk factor for eating disorders with low socioeconomic backgrounds of both genders<sup>19</sup>.

In the second part of the results for detailed analyses concerning dieting, multivariate statistics were used and included all nutritional and psychological variables as well as the body mass index (BMI). The results of discriminant analysis show how the total sample is divided in terms of food preferences and psychological well-being in a way of dieting behavior. For this kind of analysis we formed 4 groups: females and males on regular diet or regular food intake and dieting females and dieting males. As far as regular food intake and dieting are concerned, the first function of discriminant analysis, which accounts for 67.8% of the total sample, indicates that the sample is divided primarily by the respondents' gender. The second function, which divided the sample by regular food intake or dieting, accounts for 16.8% of variance (Figure 7). The contents of function 1, which divided the sample by gender, are shown in Table 2. The males more frequently consumed: milk, fast food, etc. except fruits

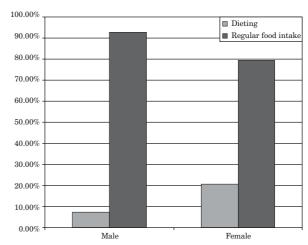


Fig. 4. Distribution of dieting behavior according to gender.

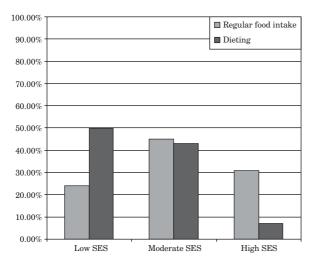


Fig. 5. Distribution of dieting behavior according to socioeconomic status among male adolescents.

and vegetables. In Table 3, the contents of function 2 are shown. Nutritional items, which divided the sample by type of nutrition, show that restrained eaters consume less animal fat, sweets, vegetable oil, meat and white bread but they consume more rice. We may conclude that in spite of differences in food consumption between dieters and non-dieters the most influential variable between adolescents in food intake is definitely *gender*. Instead of differences according to type of nutrition, our results confirm that food preferences by gender are much more influential.

The same statistical analysis was applied to all *psychological variables*. In the domain of psychological variables the sample was divided first by type of nutrition and only then by gender (Figure 8). That means that psychological characteristics of both genders are connected with their nutritional behavior. In the psychological variables domain, function 1 divides the sample by type of nutrition and accounts for 52.1% of variance and function 2, which divides the sample on the basis of gender, for 36.5% of variance. It is important to point out that

TABLE 2
CONTENT OF FUNCTION 1 IN FOOD PREFERENCES AMONG DIETERS AND NON DIETERS ACCORDING TO GENDER OBTAINED BY DISCRIMINANT ANALYSIS

Variables	Function 1-Gender
Milk	0.417*
Fast food	0.414*
Cottage cheese	0.324*
Olive oil	0.308*
Pasta	0.264*
Soft drinks	0.299*
Cheese	0.223*
Fish and seafood	0.215*
Fruits and vegetables	-0.173*

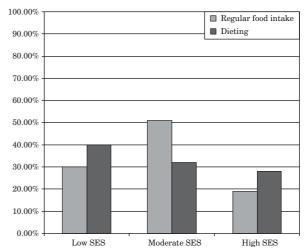


Fig. 6. Distribution of dieting behavior according to socioeconomic status among female adolescents.

the results of the discriminant analysis clearly show that the dieters and non-dieters differ primarily by psychological characteristics. The discriminant analysis clearly shows that function 1, which divides the sample by type of nutrition, consists of two psychological variables: body-image and self esteem (Table 4), while function 2 consists of life satisfaction and psychological stress and divides the sample by gender (Table 5). That means that those adolescents of both genders, female and male ones, demonstrating dieting behavior have the same level of body dissatisfaction and negative level of self-esteem regardless of their gender.

In order to find out what variables could be considered direct predictors of *dieting behavior*, the effects of gender, the BMI, self-esteem, body image, life satisfac-

TABLE 3 CONTENT OF FUNCTION 2 IN FOOD PREFERENCES AMONG DIETERS AND NON-DIETERS ACCORDING TO GENDER OBTAINED BY DISCRIMINANT ANALYSIS

Variables	Function 2-Diet
Animal fat	0.428*
Sweets	0.386*
Vegetal oil	0.387*
Vhite bread	0.349*
<b>I</b> eat	0.224*
Rice	-0.196*

TABLE 4
CONTENT OF FUNCTION 1 IN PSYCHOLOGICAL WELL-BEING
AMONG DIETERS AND NON-DIETERS ACCORDING TO GENDER
OBTAINED BY DISCRIMINANT ANALYSIS

Variables	Function 1-Diet		
Body-image	0.945*		
Self esteem	-0.407*		

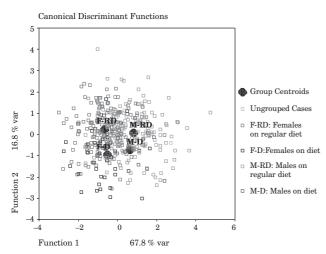


Fig. 7. Differences in food preferences among dieters and non-dieters according to gender obtained by discriminant analysis.

tion and stress on dieting behavior were analyzed using the logistic regression model (Table 6). As a dependent variable, dieting behavior was influenced by four variables, which were maintained in the final step of the logistic regression model (-2LL= 199.599;  $\chi^2$ =43.226; p<0.001): gender (p=0.03) as the only demographic variable, life satisfaction (p=0.05) and body image (p=0.006) as psychological variables and the BMI (p=0.03) as anthropometric variable. The result indicates that dieting, as a health and cultural phenomenon, is largely influenced by the interaction of psychological and biological factors (Figure 9). As hypothesized, female adolescents are dieting 2.5 times more than their male counterparts and as hypothesized they also reported the highest level of body dissatisfaction. According to our results, the psychological variables of body image and life satisfaction function

TABLE 5
CONTENT OF FUNCTION 2 IN PSYCHOLOGICAL WELL-BEING AMONG DIETERS AND NON-DIETERS ACCORDING TO GENDER OBTAINED BY DISCRIMINANT ANALYSIS

Variables	Function 1-Diet		
Life satisfaction	0.854*		
Stress	0.225*		

TABLE 6
DIET BEHAVIOR ESTIMATION ACCORDING TO DEMOGRAPHIC,
PSYCHOLOGICAL AND ANTROPOMETRICAL VARIABLES BY LOGISTIC REGRESSION MODEL

	В	SEB	p	EXP (B)
Constant	-5.2630	1.8506	0.0045	
Gender	0.9193	0.4343	0.0343	2.5075
Life satisfaction	-0.0956	0.501	0.0500	0.9088
Body Image	0.5959	0.2175	0.0061	1.2743
BMI	0.1189	0.0565	0.0354	1.1263

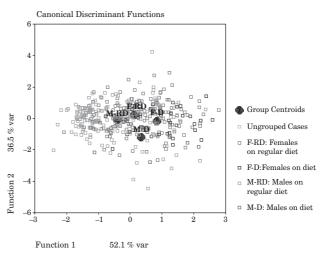


Fig. 8. Differences in psychological well-being among dieters and non-dieters according to gender obtained by discriminant analysis.

as the direct predictors of dieting behavior in both genders. As shown by other studies, the link between body image and dieting is clearly apparent in female adolescents but it is not in males<sup>19</sup>. These results suggest that both genders, however, could misperceive their body image, and that they make judgments about their appearance using different standards. Girls are more likely to judge themselves overweight when by objective standards they are not, whereas boys are more likely to perceive themselves as underweight with respect to objective standards<sup>19</sup>.

As in previous analyses the respondents of both genders who were dieting showed low body image satisfaction, our next step was to explore the influence of variables: gender, the BMI, dieting, life satisfaction, self-esteem and stress on *body image* by means of the same logistic regression model. Five variables were left out in the final

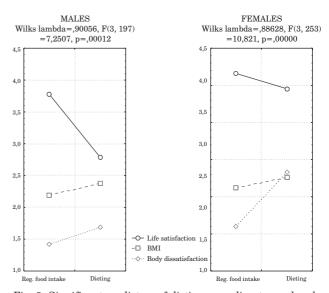


Fig. 9. Significant predictors of dieting according to gender obtained by logistic regression model.

step of the logistic regression model (-2LL= 310.647;  $\chi^2$ =57.356, p<0.001): demographic variables of gender (p=0.01) then self-esteem (p=0.0008), stress (p=0.002)and the BMI (p<0.001) (Table 7). Research on the relationship between body image, self-esteem and stress in both genders has been documented (Figure 10). Regarding the results of correlations between psychological variables in our study, each decrease of self-esteem on the scale implies a decrease in body satisfaction. While each increase of stress implies increase in body dissatisfaction. But among females this interaction between psychological variables connected with dieting is more pronounced. As in previous analyses the respondents who were dieting scored low life satisfaction as well, we also analyzed the influence of gender, the BMI, self-esteem, body image, dieting and stress on life satisfaction by means of the logistic regression model.

As a dependent variable life satisfaction was influenced by four variables, maintained in the final step of the model ( $\chi^2 = 77.729$ , p<0.001): gender (p=0.003), and self-esteem (p<0.001) and psychological stress (p<0.001) as psychological variables (Table 8). The respondents demonstrating low levels of life satisfaction are also more exposed to high levels of stress and low self-esteem (Figure 11). If psychological stress increases, life satisfaction decreases and at the same time probability for dieting grows. And if self esteem decreases life satisfaction decreases. Psychological stress in the context of adolescents and its relationship to self-esteem appear to be crucial components in the identification of young people at risk for dieting<sup>20</sup>. These risk factors for dieting are present for both genders during adolescence, but their intensity seems to be stronger among girls. The most interesting

TABLE 7
BODY IMAGE ESTIMATION ACCORDING TO DEMOGRAPHIC,
PSYCHOLOGICAL AND ANTROPOMETRICAL VARIABLES BY
LOGISTIC REGRESSION MODEL

	В	SEB	p	EXP (B)
Constant	-4.7345	2.7315	0.0830	
Gender	-0.7446	0.2899	0.0102	0.4749
Self esteem	0.1395	0.0417	0.0008	1.1497
Stress	-0.0279	0.0093	0.0026	0.9725
BMI	-0.1938	0.0474	0.0001	0.8238

TABLE 8
LIFE SATISFACTION ESTIMATION ACCORDING TO DEMOGRAPHIC, PSYCHOLOGICAL AND ANTROPOMETRICAL VARIABLES BY LOGISTIC REGRESSION MODEL

	В	SEB	p	EXP (B)
Constant	1.5343	3.3770	0.6496	
Gender	1.1267	0.3826	0.0032	3.0855
Self esteem	0.2908	0.0603	0.0001	1.3376
Stress	-0.0470	0.0116	0.0001	0.9541

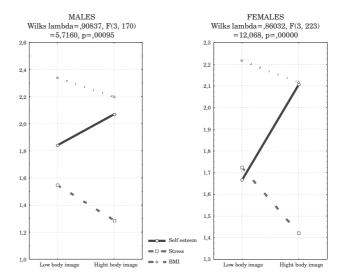


Fig. 10. Significant predictors of body-image perception according to gender obtained by logistic regression model.

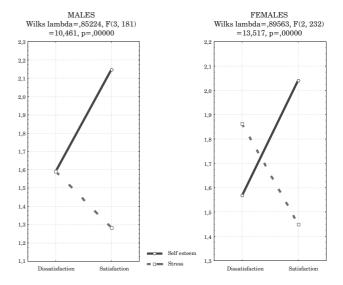


Fig. 11. Significant predictors of life satisfaction according to gender obtained by logistic regression model.

result of our study as far as dieting is concerned regards the indirect effect of psychological stress and self-esteem on dieting, which seems to be mediated through life satisfaction and body image perception as direct predictors of dieting behavior (Figure 11). This finding has to be applied to early detection of disturbances in food habits and dieting behavior.

# **Conclusions**

From the overall results obtained, it is possible to conclude that dieting behavior in adolescence is not influenced only by perception of »the way in which our body appears to us« but by a much broader spectrum of fac-

tors, including cultural values, social expectations and psychological well-being. As we hypothesized, female adolescents exhibited more frequent dieting behavior and lower body image satisfaction. Among the societal factors, socioeconomic status gives rise to dieting in both genders of adolescent group. Overall eating behavior in adolescents was highly correlated with body image and life satisfaction, while these psychological variables were also correlated with self-esteem and psychological stress. This study also confirms a strong relationship between stress and self-esteem with body image and life satisfaction, which are direct predictors of dieting behavior in both genders.

## Acknowledgement

The research is funded by the Ministry of Education, Science and Sports of the Republic of Croatia under grant 196-1962766-2743 for the project »Contemporary transformation of local speech communities and cultural diversity« and under grant of European Community project »Heath problems, mental disorders and cross-cultural aspects of developing effective rehabilitation procedures for refugees of the war-affected countries« ICA2-CT-2002-10006. The insights made in this paper would not be achieved without a precious support and help of Professor Lajos Szirovicza, statistician and mathematician in the Institute for Anthropological Research.

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#### L. Peternel

Institute for Anthropological Research, Gajeva 32, 10000 Zagreb, Croatia e-mail: lana@inantro.hr

# PREHRAMBENO PONAŠANJE ADOLESCENATA, PERCEPCIJA VLASTITOG TIJELA I PSIHOLOŠKO DOBROSTANJE

# SAŽETAK

Ovaj rad usmjeren je na istraživanje adolescenata oba spola srednjih škola u Dalmaciji u Republici Hrvatskoj. Istraživanjem se željelo ispitati prehrambeno ponašanje adolescenata te njegova povezanost sa psihološkim dobrostanjem te indeksom tjelesne mase (ITM) i percepcijom vlastitog izgleda. Razlike u prehrambenom ponašanju između adolescenata i adolescentica istražene su prema osnovnim demografskim osobitostima populacije. Rezultati su pokazali statistički značajnu povezanost psiholoških varijabli s dijetalnim ponašanjem kod ispitanika oba spola. Adolescenti i adolescentice na dijeti imaju značajno niže samopoštovanje, niže zadovoljstvo životom i lošiju percepciju vlastitog izgleda, višu razinu psihološkog stresa te viši indeks tjelesne mase (ITM) u usporedbi s vršnjacima i vršnjakinjama koji imaju uobičajeni način prehrane. Adolescenti i adolescentice se također razlikuju prema socioekonomskom statusu i učestalije su na dijeti oni nižeg socioekonomskog statusa. Ovo istraživanje je ukazalo da dijetalni način prehrane negativno utječe na psihosocijalni razvoj u adolescenciji.