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*Source / Izvornik:* **Collegium antropologicum, 2009, 33, 67 - 73**

**Journal article, Published version**
**Rad u časopisu, Objavljena verzija rada (izdavačev PDF)**

*Permanent link / Trajna poveznica:* https://urn.nsk.hr/urn:nbn:hr:105:525292

Coll. Antropol. **33** (2009) Suppl. 1: 67–73
Original scientific paper

# Health Behavior Factors Associated with Obesity in the Adult Population in Croatia

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**A B S T R A C T**

*The aim of this study was to examine the association of obesity and selected health behaviors, based on the data from Croatian Adult Health Survey 2003. Cross-sectional study on representative random sample of 9070 Croatian adults showed that in both men and women, mean BMI varied significantly with age ($p<0.001$). It tended to increased with age until 55–64 years, and then decreased slightly in men, but remained unchanged in women. The prevalence of obesity (BMI ≥ 30,0 kg $m^{-2}$) demonstrated almost the same prevalence in men and women, 20.1% and 20.6% respectively. The likelihood of being obese, either in men or women, was more likely in the middle-aged groups, among respondents from rural areas and those from the Continental region of Croatia, with drinking lifestyle pattern, and non-smokers. Women who mostly used animal fat for food preparations were more likely to be obese. Overweight and obesity are major public health problem in the adult population in Croatia. and health promotion strategies based on behavioral correlates are needed to prevent excess weight gain in the Croatian population.*

***Key words:*** *body mass index, obesity, lifestyle behaviors, Croatian Adult Health Survey, Croatia*

## Introduction

Overweight and obesity have become one of the major health problems of the world today, replacing the importance of significant causes of poor health in the past, such as infectious diseases and malnutrition[1]. Obesity is widely accepted as an important risk factor for many chronic diseases, namely cardiovascular disease[2,3], hypertension[4–10], stroke[11], diabetes mellitus [4,10,12], and certain cancers[13–21].

A modern life style, foods rich in free sugar and saturated fats, and reduced physical activity lead to concerning increase in the prevalence of overweight and obesity. According to the prediction of World Health Organization (WHO), 300 million people in the world are likely to be obese by the year 2025[2]. The United States of America reported that 60.5% of adult population was overweight, 23.9% was obese, and 3.0% was extremely obese in 2005. Also, they encountered substantial increase in age-adjusted obesity rates from 1995–2005 (15.6% in 1995, 19.8% in 2000, and 23.7% in 2005)[22]. In Croatia, the prevalence of obesity and other cardiovascular disease risk factors is also high, with substantial differences among country regions. Obesity (defined as BMI ≥30) ranged from 17–25% for men, and from 12–26% for women[23]. Numerous studies have investigated the relationship between behavioral factors and obesity and findings are not consistent. A significant association has been found between weight gain and aging[24–26].

The aim of this paper was to examine the association of obesity and selected health behaviors in the adult population of Croatia, based on the Croatian Adult Health Survey 2003 data.

## Methods and Materials

### *Sample*

This study was based on the Croatian Adult Health Survey 2003 data. The sample encompassed a representative sample of the adult Croatian population, distributed within six regions of Croatia. The sample consisted of 9070 responses, obtained by the public health nurses during face-to-face interviews in the respondents' houses. Sampling methodology and weighting procedure were described in detail elsewhere[27].

Received for publication June 1, 2008

*Variables*

Self-reported body weight and height were used to calculate body mass index (BMI).

Body mass index (BMI) was calculated as weight in kilograms divided by the square of height in meters. Participants were categorized according to relative body weight status using WHO criteria[1] (underweight: BMI ≤ 18.49 kg $m^{-2}$; normal: BMI = 25.0–29.99 kg $m^{-2}$; overweight BMI = 25.0–29.99 kg $m^{-2}$; obese: BMI ≥ 30.0 kg $m^{-2}$).

The health behavior information was based on self-reported information from responders. For present study, data on one key indicator from each of the four areas of health behavior were chosen. The variable describing smoking prevalence was „smoking index« based on several questions concerning duration of smoking in years and current smoking status and then dichotomized as daily and occasional smokers and others. Among responders who answered that they drink alcohol, binge drinking was positive if responders drank six or more spirits at once. People were asked what kind of fat they mostly used for food preparation at home. This variable was dichotomized as vegetable oil users and others. Information about leisure-time physical exercise was elicited in the following question: 'How often do you engage in physical exercise in your free-time for at least 30 min causing you to be at least mildly short of breath or to perspire?' Possible responses were: daily, 4–6 times per week, 2–3 times per week, once per week, 2–3 times per month, a few times a year or less, or 'I cannot exercise because of an illness or disability'. The variable was divided into two categories: frequent exercise (2–3 times per week or more) and others.

*Statistics*

Statistical analysis was performed using SPSS (version 14.01; License: Croatian National Institute of Public Health). BOOTVARE_V21.SPS Program (Version 2.1; author: Statistics Canada) was used for calculating confidence intervals by using »bootstrap« method which takes into account sample design information when calculating variance estimates and measures the potential size of the sampling [27–29].

As sex and age are strongly associated with BMI, the results were stratified by sex and age. Mean BMI was calculated for each age group. Distribution of the respondents according to their BMI category was calculated. Multiple logistic regression analysis was used to estimate the likelihood of being obese (BMI ≥ 30) according to several behavioral variables (binge drinking, physical activity, smoking, dietary habits) with adjustment for all other variables included in analysis.

## Results

Of the 10766 individuals contacted 9070 accepted to participate in the study (response rate 84.3%). There were no women known to be pregnant in the study.

The unadjusted mean BMI by sex and age group are given in Table 1. Men had a higher mean BMI than women at all ages until age 54 years. In age 55–64 years mean BMI was same in both sexes. In the oldest age group, older than 65 years, mean BMI demonstrated the opposite trend, with mean BMI in women (28,1 kg $m^{-2}$) exceeding that in men (27,2 kg $m^{-2}$).

Gender differences tend to be larger in younger age groups. In both men and women, mean BMI varied significantly with age ($p<0.001$). It tended to increase with age until 55–64 years, then decrease slightly in men, but it remained unchanged in women (Figure 1).

The prevalence of overweight (BMI 25,0–29,99 kg $m^{-2}$) in men (43,2%) was considerably greater than that in women (33,6%), whereas the prevalence of obesity (BMI ≥ 30,0 kg $m^{-2}$) demonstrated almost the same prevalence for men and women, 20,1% and 20,6% respectively.

Analysis of behavioral variables showed that smoking and consumption of animal fats were significantly associated with obesity. Analysis found that smokers, either

**TABLE 1**
MEAN BODY MASS INDEX (BMI) AND PROPORTION OD OWERVEIGHT AND OBESITY, BY SEX AND AGE GROUP

| Sex and age group (years) | BMI ($kgm^{-2}$) | Overweight (%) | Obese (%) |
|---|---|---|---|
| Men | | | |
| All ages | 26.8 | 43.2 | 20.1 |
| 18–34 | 24.9 | 29.3 | 10.1 |
| 35–44 | 27.3 | 48.1 | 21.0 |
| 45–54 | 27.6 | 48.5 | 26.4 |
| 55–64 | 28.1 | 49.9 | 27.9 |
| 65+ | 27.2 | 49.0 | 21.6 |
| Women | | | |
| All ages | 26.1 | 33.6 | 20.6 |
| 18–34 | 22.9 | 17.1 | 6.3 |
| 35–44 | 25.2 | 33.9 | 13.5 |
| 45–54 | 27.4 | 40.4 | 26.3 |
| 55–64 | 28.1 | 39.1 | 32.8 |
| 65+ | 28.1 | 42.9 | 29.7 |

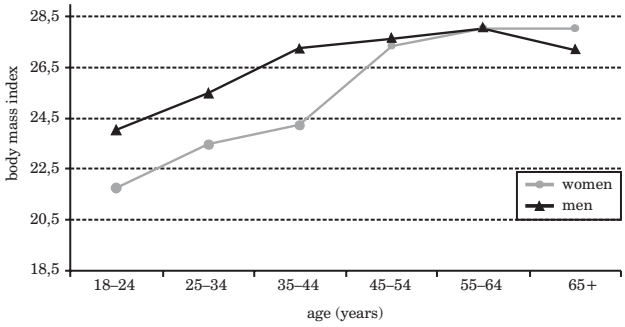


*Fig. 1. Mean body mass index (BMI) in Croatia, by sex and age group.*

**TABLE 2**
PREVALENCE OF OBESITY AND ADJUSTED* ODDS RATIO (OR) FOR THE LIKELIHOOD OF BEING OBESE, BY SEX AND OTHER RELATED VARIABLES

| | Men | | | Women | | |
|---|---|---|---|---|---|---|
| | Obesity (%) | Adjusted* OR for being obese | | Obesity (%) | Adjusted* OR for being obese | |
| | | OR | 95% CI | | OR | 95% CI |
| Age group (years) | | | | | | |
| 18–34 | 18.7 | 1.00 | | 11.8 | 1.00 | |
| 35–44 | 21.0 | 2.96 | 1.69–5.20 | 13.5 | 7.57 | 4.71–12.18 |
| 45–54 | 26.4 | 3.72 | 2.16–6.42 | 26.3 | 8.27 | 5.07–13.49 |
| 55–64 | 27.9 | 3.73 | 2.15–6.46 | 32.8 | 6.63 | 4.25–10.34 |
| 65+ | 21.6 | 2.72 | 1.53–4.84 | 29.7 | 2.46 | 1.42–4.27 |
| Fats | | | | | | |
| Vegetable | 20.5 | 1.00 | | 18.8 | 1.00 | |
| Animal | 19.2 | 0.80 | 0.56–1.13 | 25.7 | 1.33 | 1.01–1.75 |
| Binge drinking | | | | | | |
| No | 76.7 | 1.00 | | 97.8 | 1.00 | |
| Yes | 23.3 | 1.40 | 0.98–2.02 | 2.2 | 1.27 | 0.49–3.29 |
| Regular leisure exercise | | | | | | |
| No | 25.1 | 1.00 | | 29.9 | 1.00 | |
| Yes | 74.9 | 1.14 | 0.86–1.53 | 70.1 | 0.95 | 0.73–1.25 |
| Smoking | | | | | | |
| Non-smoker | 59.8 | 1.00 | | 73.4 | 1.00 | |
| Daily smoker | 40.2 | 0.71 | 0.54–0.94 | 26.6 | 0.59 | 0.41–0.84 |

CI – confidence interval
* Odds ratios are adjusted for all variables in the multivariate logistic regression analysis

men or women, are less likely to be obese than non smokers. Women who mostly used animal fats for food preparation at home were significantly more likely to be obese. Opposite direction have been found in men, but it was not statistically significant. No consistent pattern with regular exercise (leisure-time physical activity) in either men or women was found. Alcohol consumption was associated to obesity in both sexes, showing that either men or women with pattern of drinking alcohol are more likely to be obese than non-drinkers but it did not reach statistical significance. Even after adjusting for all variables, the odds of being obese increases significantly with age, particularly in middle-aged women compared with the youngest age group, women aged 18–24 years (45–54 years: OR 8.27; 95% CI 5.07–13,49), as well as in middle-aged men compared with middle-aged men (45–54 years: OR 3.72; 95% CI 2.16–6.42) and the gender difference and obesity remained highly significant (OR=0,72 for women compared to men; 95% CI 0,71–0,73; p<0,001) (Table 2).

There is a urban-rural difference in both sexes. Analysis found that is more likely to be obese when living in rural environment compared to living in urban environment in men (OR=1,44; 95% CI 1,12–1,86) and in women (OR=1,40; 95% CI 1,07–1,82). In both men and women, mean BMI varied with age (p<0.001). It tended to increase with age until 55–64 years, then decreased slightly in men, but continued to increase in women, particularly in the urban environment (Table 3). Participants, men and women, tended to be more obese when living in rural environment in all age groups except for the oldest group in women. Environmental differences tended to be larger in younger age groups. The significance was reached for middle-age women. Analysis of behavioral variables showed similar pattern as in Croatia as whole. Even after

**TABLE 3**
PREVALENCE OF OBESITY IN URBAN AND RURAL ENVIRONMENT OF CROATIA, BY SEX AND AGE GROUP

| Sex and age group (years) | Urban environment | | Rural environment | |
|---|---|---|---|---|
| | Obese (%) | 95% CI | Obese (%) | 95% CI |
| Men | | | | |
| 18–29 | 4.68 | 0.75–8.61 | 13.70 | 5.30–22.10 |
| 30–64 | 22.60 | 19.90–25.29 | 25.61 | 22.17–29.05 |
| 65+ | 20.45 | 16.52–24.40 | 23.38 | 18.72–28.05 |
| Women | | | | |
| 18–29 | 2.81 | 1.15–4.47 | 9.08 | 4.60–13.56 |
| 30–64 | 19.01 | 17.04–20.98 | 26.30 | 23.60–29.00 |
| 65+ | 30.34 | 26.77–33.92 | 28.90 | 24.35–33.46 |

CI – confidence interval

**TABLE 4**
ADJUSTED* ODDS RATIO (OR) FOR THE LIKELIHOOD OF BEING OBESE IN URBAN AND RURAL ENVIRONMENT OF CROATIA, BY SEX AND OTHER RELATED VARIABLES

| | Men | | | | Women | | | |
|---|---|---|---|---|---|---|---|---|
| | Urban environment | | Rural environment | | Urban environment | | Rural environment | |
| | Adjusted* OR for being obese | | Adjusted* OR for being obese | | Adjusted* OR for being obese | | Adjusted* OR for being obese | |
| | OR | 95% CI | OR | 95% CI | OR | 95% CI | OR | 95% CI |
| Age group (years) | | | | | | | | |
| 18–34 | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| 35–44 | 3.73 | 1.65–8.41 | 2.00 | 1.04–3.82 | 9.96 | 5.34–18.57 | 5.46 | 2.31–12.88 |
| 45–54 | 5.87 | 2.68–12.86 | 1.63 | 0.77–3.45 | 10.33 | 5.36–19.91 | 6.72 | 2.56–17.61 |
| 55–64 | 4.25 | 1.86–9.70 | 2.96 | 1.37–6.41 | 8.58 | 4.93–14.91 | 5.09 | 2.05–12.62 |
| 65+ | 3.00 | 1.25–7.24 | 2.15 | 0.96–4.85 | 3.34 | 1.64–6.84 | 1.66 | 0.63–4.36 |
| Fats | | | | | | | | |
| Vegetable | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Animal | 0.96 | 0.61–1.50 | 0.54 | 0.34–0.86 | 1.33 | 0.92–1.91 | 1.06 | 0.63–1.80 |
| Binge drinking | | | | | | | | |
| No | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Yes | 1.21 | 0.72–2.01 | 1.77 | 1.08–2.90 | 1.10 | 0.02–51.59 | 1.55 | 0.00–2160.13 |
| Regular leisure exercise | | | | | | | | |
| No | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Yes | 1.14 | 0.76–1.70 | 1.09 | 0.75–1.58 | 0.83 | 0.61–1.12 | 1.12 | 0.70–1.79 |
| Smoking | | | | | | | | |
| Non-smoker | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Daily smoker | 0.83 | 0.59–1.17 | 0.53 | 0.34–0.85 | 0.59 | 0.40–0.86 | 0.68 | 0.32–1.42 |

CI – confidence interval
* Odds ratios are adjusted for all variables in the multivariate logistic regression analysis

adjusting for all variables, the odds of being obese increases significantly with age and among non-smokers, in both men and women, in both environments, rural and urban. In addition, men in rural environment with drinking lifestyle pattern are significantly more likely to be obese. Using of animal fats tended to be protective factor for being obese in men in rural environment (Table 4).

**TABLE 5**
PREVALENCE OF OBESITY IN CONTINENTAL AND MEDITERRANEAN REGION OF CROATIA, BY SEX AND AGE GROUP

| Sex and age group (years) | Mediterranean region | | Continental region | |
|---|---|---|---|---|
| | Obese (%) | 95% CI | Obese (%) | 95% CI |
| Men | | | | |
| 18–29 | 9.30 | –1.71–20.32 | 6.81 | 3.60–10.02 |
| 30–64 | 20.73 | 17.15–24.32 | 25.23 | 22.48–27.98 |
| 65+ | 20.26 | 18.64–25.93 | 22.29 | 14.00–26.52 |
| Women | | | | |
| 18–29 | 2.33 | –0.36–5.01 | 6.33 | 3.76–8.90 |
| 30–64 | 13.84 | 11.58–16.10 | 25.20 | 23.07–27.34 |
| 65+ | 20.14 | 16.37–23.91 | 34.23 | 30.52–37.93 |

CI – confidence interval

There is a significant Mediterranean-Continental difference in obesity prevalence only among women. Women living in Mediterranean part of Croatia were significantly less likely to be obese compared to those living in Continental part of Croatia, (OR=0,44; 95% CI 0,32–0,60), while that was not the case for men (OR=0,91; 95% CI 0,66–1,27).In both, men and women, mean BMI increased with age ($p<0.001$) (Table 5). Analysis of behavioral variables for both, men and women, in Continental part of Croatia showed similar pattern as in Croatia as whole. In Continental part of Croatia the odds of being obese increases significantly with age and among non-smokers, in both men and women. Men in Continental region with drinking lifestyle pattern are significantly more likely to be obese. There is no relationship found between any of analyzed behavioral factors and obesity in men and women in Mediterranean part of Croatia, except that regular leisure active Mediterranean men are significantly more likely to be obese. The likelihood of being obese, either in men or women in Mediterranean region, except for youngest-aged women, showed no association neither with age nor any of observed behavioral lifestyle risk factors (Table 6).

**TABLE 6**
ADJUSTED* ODDS RATIO (OR) FOR THE LIKELIHOOD OF BEING OBESE, BY SEX AND OTHER RELATED VARIABLES IN CONTINENTAL AND MEDITERRANEAN REGION OF CROATIA

| | Men | | | | Women | | | |
|---|---|---|---|---|---|---|---|---|
| | Continental region | | Mediterranean region | | Continental region | | Mediterranean region | |
| | Adjusted* OR for being obese | | Adjusted* OR for being obese | | Adjusted* OR for being obese | | Adjusted* OR for being obese | |
| | OR | 95% CI | OR | 95% CI | OR | 95% CI | OR | 95% CI |
| Age group (years) | | | | | | | | |
| 18–34 | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| 35–44 | 2.91 | 1.71–4.97 | 3.17 | 0.01–692.58 | 8.02 | 4.37–14.71 | 8.41 | 1.01–10.89 |
| 45–54 | 3.65 | 2.11–6.29 | 3.56 | 0.02–783.42 | 9.88 | 5.49–17.77 | 6.24 | 0.69–56.33 |
| 55–64 | 4.09 | 2.44–6.87 | 2.96 | 0.01–630.25 | 7.86 | 4.57–13.51 | 3.97 | 0.47–33.50 |
| 65+ | 2.69 | 1.52–4.76 | 2.73 | 0.01–592.40 | 2.87 | 1.47–5.59 | 1.48 | 0.72–30.36 |
| Fats | | | | | | | | |
| Vegetable | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Animal | 0.77 | 0.55–1.09 | 0.23 | 0.55–1.43 | 1.14 | 0.85–1.52 | 0.7 | 0.03–17.68 |
| Binge drinking | | | | | | | | |
| No | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Yes | 1.58 | 1.07–2.31 | 0.12 | 0.28–2.43 | 1.13 | 0.10–12.35 | | |
| Regular leisure exercise | | | | | | | | |
| No | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Yes | 0.90 | 0.64–1.26 | 1.99 | 1.12–3.56 | 1.05 | 0.79–1.39 | 0.85 | 0.45–1.63 |
| Smoking | | | | | | | | |
| Non-smoker | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Daily smoker | 1.58 | 1.07–2.31 | 0.94 | 0.31–2.88 | 0.48 | 0.32–0.72 | 1.78 | 0.00–34192.757 |

CI – confidence interval
* Odds ratios are adjusted for all variables in the multivariate logistic regression analysis

## Discussion

This study provides new evidence on the prevalence of obesity in Croatia and influence of lifestyle factors on it. However, some methodological issue must be considered before discussing the findings in detail. One strength of the study is its relatively high response rate (83,4%) The response rate is similar to the rates achieved in recent surveys conducted in other countries in transition[30–32]. This study found that obesity is highly prevalent in Croatia. Over 60% of men and 50% of women in the study had an excess body weight. We found that 20.1% of men and 20.6% of women aged over 18 in Croatia are obese. Prevalence of obesity is considerably higher in Croatia than in Mediterranean countries such as Italy and Spain. Only 7% of Italian men and 6% of Italian women aged 15 years and over were reported to be obese in 1990[33]. In Spain, 12% of Spanish men and women aged 16 years and over were found to be obese in 1997[34]. Obesity rates in Croatia is similar to rates in Albania aged 25 and older (22% of men, 31% of women in 2001)[35]. Over the last decades the prevalence of obesity has increased in most countries of the world[36–39]. In the MONICA (Monitoring Trends and Determinants in Cardiovascular Disease) study the percentage of obese men increased in three-quarters of the populations and the percentage of obese women in more than half of the population. MONICA project showed much higher obesity rates at middle-aged individuals (35–65 years) in Croatia than in Italy (14–17% of men, 18–19% of women in 1993/94) and Spain (16% of men and 25% of women). MONICA results for Yugoslavia (Novi Sad) found a higher prevalence of obesity in middle-aged individuals than in Italy or Spain (20% of men, 32% of women in 1994/95), but still lower for men than we observed[39]. Croatia was undergoing many political, economic and social changes in the last two decades. Those changes might have influenced the prevalence of obesity. Based on data from countries in transition it is possible that the modernization of lifestyle and increased urbanization played an important role in such a high prevalence of obesity in Croatia[40–42]. This study showed clear gender differences in the prevalence of overweight, with men of all age groups being more likely to be more overweight than women and no gender differences in the prevalence of obesity. It could not be entirely explained by the lifestyle behaviors inves-

tigated in this study. Similar findings have been reported in other populations[43,44]. There are some other studies with inverse gender differences reported[35,45,46]. As in other reports this study has found a statistically significant association between aging and a higher prevalence to be obese[25,26,37]. We found a significant association between smoking and a lower prevalence of obesity. Our results on the association between smoking and obesity are basically in line with those of other studies. Smoking is usually associated with lower BMI[47–51]. We did not observe any association with physical activity level during leisure time, except an association in Mediterranean men. It might be due to the fact that routine daily physical activity levels (e.g. walking, gardening, manual working) may be more important determinants of physical activity level than leisure-time physical activity[52]. Regular leisure active Mediterranean men are significantly more likely to be obese. No such association has been described in the literature and further analyses are needed to precise assessment of this behavior. We found a positive relationship between frequent consumption of alcohol and obesity in both, men and women. This association almost reached statistical significance overall for men and when we analyzed in depth the one was significant for men in rural environment and in Continental part of Croatia. Even evidently positive, relationship was not statistically significant in women. Underreporting of alcohol consumption in women most probably contribute to our findings and explain why those association was not significant. Over-consumption of alcohol might be expected to lead to an excess weight gain, but the results from other epidemiological studies on this association are conflicting[53,54].

In conclusion, we found that the likelihood of being obese, either in men or women, is more likely in middle-aged groups, among participants in rural living environment and in Continental region of Croatia, with drinking lifestyle pattern, and former or non-smoker. Women mostly used animal fats for food preparation at home is more likely to be obese. This study suggests that excess weight and obesity are major public health problems in Croatia, and that they can lead to an increase in morbidity and mortality from non-communicable diseases. The problem is even bigger than expected, suggesting that health promotion strategies aiming to prevent and reduce the current prevalence rates are needed immediately. A more precise exploration of modifiable lifestyle behaviors are needed for understanding the determinants of obesity and to define the most effective health promotion strategies in reducing obesity and preventing non-communicable diseases in Croatia.

## Acknowledgements

We thank prof. S. Vuletić and prof. J. Kern for their support and guidance. This article was prepared as a part of scientific project »Regionalism of cardiovascular behavioral risk factors – model of intervention« (108-1080135--0264) supported by Ministry of Science, Education and Sport of the Republic of Croatia.

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## POVEZANOST ŽIVOTNIH NAVIKA I DEBLJINE ODRASLOG STANOVNIŠTVA HRVATSKE

### S A Ž E T A K

Cilj ovog rada bio je istražiti povezanost debljine sa životnim navikama; pušenjem, tjelesnom aktivnošću, konzumacijom alkohola i prehrambenim navikama, na temelju podataka iz Hrvatske zdravstvene ankete 2003. Presječno istraživanje na reprezentativnom slučajnom uzorku od 9070 odraslih osoba iz Hrvatske pokazalo je da se i kod muškaraca i kod žena, indeks tjelesne mase (ITM) značajno raste s dobi ($p<0,001$) do dobne grupe 55–64 godine, potom se blago smanjuje kod muškaraca, a ostaje nepromijenjen u žena. Prevalencija debljine (BMI $\geq$ 30,0 kg $m^{-2}$) u Hrvatskoj iznosi 20,1% za žene, odnosno 20,6% za muškarace. Istraživanje je pokazalo da, i kod žena i kod muškaraca statistički značajno ($p<0,05$) raste vjerojatnost za debljinu u srednjoj životnoj dobi, kod stanovnika seoskih naselja, kod stanovnika kontinentalnog dijela Hrvatske, s alkoholnim habitusom i kod nepušača. Žene koje pretežno koriste životinjske masnoće u prehrani imaju statistički značajnu vjerojatnost za razvoj debljine. Debljina je jedan od najvažnijih javnozdravstvenih problema u Hrvatskoj. Javnozdravstveni programi usmjereni na promjenljive životne navike potrebni su za smanjenje postojećeg i prevenciju daljnjeg širenja ovog značajnog javnozdavstvenog problema.