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Cardiovascular and Behavioral Risk Factors in Relation to Self-Assessed Health Status

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A B S T R A C T

The purpose of this study was to explore biomedical and behavioral risk factors in relation to self-assessed physical, mental and general health status in an open adult Croatian population sample. Subjective experience of health status was assessed with the Short Form 36 Health Survey questionnaire (SF-36). Out of 9070 respondents, we defined two groups with respect to cardiovascular (CV) risk factors: (1) a healthy group of individuals who did not state the presence of any covered chronic disease or disorder (N=1,817), and (2) a group with CV risk which included individuals who reported having high blood pressure or high blood cholesterol or high blood sugar diagnosed (N=360). When adjusted for socio-demographic characteristics, these two groups differed in self-assessed health status. The group with CV risk factors showed an average lower level of subjective health status than the healthy group. At the level of specific health dimensions, the group with CV risks reported significantly lower general and mental health, but they reported healthier behaviors at the present time. We analyzed the measured health behaviors in predicting individual differences in the physical, mental and general health of the healthy group. Physical activity was revealed as a significant predictor of all three aspects of subjective health. Socio-economic variables of age, gender and self-assessed economic status contributed significantly to the explanation of all three aspects of subjective health. Our findings emphasize that psychological, physical, and social factors are inextricably linked in maintaining cardiovascular health, thus showing the importance of targeting health-related behaviors, especially physical activity, in preventive strategies and programs.

Key words: *Cardiovascular risks, Croatian Adult Health Survey, health behavior, self-assessed health status, SF-36, Croatia*

Introduction

Cardiovascular diseases (CVD) are the leading cause of morbidity and mortality in developed countries, as well as in the middle-income countries. It is evidence--based that a healthy and preventive lifestyle, as well as early diagnosis, can systematically fight the causes of CVD and save millions of life-years. An increase in life expectancy among middle-aged people has been registered over recent decades in many Western countries[1]. This positive change is partially due to major declines in cardiovascular disease death rates that began in the mid-1960s in the United States. The same has been experienced in many other industrialized countries, although not yet to the same level in eastern European countries. At root are changes in the population levels of different risk factors such as smoking and inappropriate dietary habits[1]. Public awareness of the problem of CVD has been documented for many years.

Today different approaches and programs exist, aiming to decrease the burden of CV diseases on the population. Some are more traditional, like the emphasis on the prevention and treatment of hypertension, controllable dietary risk factors, the measures recommended for decades[2]. One of the newer approaches is the MyHeart project of the European Commission's 6th Framework Program. The MyHeart mission is to empower citizens to fight cardiovascular diseases with preventive lifestyle and early diagnosis[3]. In its longitudinal study of fifteen years, the goal was to assess the association between dietary patterns and CVD. It concluded that, over this period of 15 years, saturated fat and cholesterol intake correlate significantly to the development of a negative CVD risk profile irrespective of gender. At the same time, intake of polyunsaturated fat was positively correlated to CVD risk profile[4]. The actual food intake is different in

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the different groups of patients with CVD, and it is one of the possibilities for intervention[5]. Very often the consequences of bad nutritional habits are overweight and obesity, and the problem is rising even in the developing countries. The risk of CVD in overweight and obese persons is strongly correlated with the common risk factors: type 2 diabetes, hypertension, lipid abnormalities. Weight reduction diminishes all risk factors and decreases the patient's global vascular risk; even moderate weight loss (10% of the initial weight) has a positive influence. The first recommendation is to lose weight using nutritional-hygienic means, and if this is not sufficient then the recommendation is to use a pharmacological treatment[6].

Popular knowledge of health risks is needed if we want to improve population health. French research has shown that CVD is recognized as an important problem by most people. One in two subjects worries about heart disease, and about 40% of participants can correctly quote causes of CVD, namely eating habits, smoking and drinking, and lifestyle. Furthermore, the authors also found clear differences in information according to social class, where participants from higher social classes were better informed[7]. Even in the most developed countries, people who are in the lower social classes have substantially shorter life expectancies and more illnesses than those in the upper classes. For example, in 1990 the life expectancy gap was more than 15 years between the worst and best counties in the United States of America. One of the worst counties regarding the given indicators was Washington DC; on the other hand, the capital of the richest nation in the world[8]. The social determinants of life seem to be of more importance than the role of the major known risk factors such as smoking, elevated blood pressure and cholesterol levels, and physical inactivity for non-communicable diseases[9]. The challenging question is the role of socio-economic circumstances earlier in life – namely, during childhood and adolescence – and their influence on later health. There is some evidence that social factors probably operate in a cumulative way[10].

Beside the objective measures of CV risks and their consequences mentioned above, self-reported measures of health status are often being included in epidemiological and community-based surveys today. The importance of monitoring and evaluating health and health-related quality of life as perceived by the general population is increasingly being emphasized nowadays. CVD causes significant health damage and serious problems for clinicians, public health, the authorities and the public in general. Identification of risk factors is paramount for effective and efficient prevention. While much health research focuses on objective outcome measures, such as morbidity or mortality defined through clinical assessment, there is an increasing emphasis on self-reported measures of health status and health-related quality of life. Their use reflects the importance of considering the people's point of view and the multidimensional nature of health[11,12]. From a public health perspective, such monitoring aids the identification of population inequalities in health status, potentially reveals unmet needs in the community, and indicates important health-promoting efforts. Following the recognition of the individual's own perception as a useful indicator of general health status, perceived health has become one of the most significant health indicators studied today.

The purpose of this study is to explore biomedical and behavioral risk factors in relation to self-assessed physical, mental and general health in an open adult Croatian population sample. We also examined the mediating effect of health behavior on the relationship between socio-demographic characteristics, anthropometric measure of BMI, and subjective health status in a group of healthy participants without existing CV risk conditions. Our hypotheses were: (1) healthy individuals without CV risk conditions, defined as stated high blood pressure or high blood cholesterol or high blood sugar, will show better subjective health than individuals with these CV risk conditions; and (2) healthy behavior defined through nutritional habits, alcohol drinking and smoking, mediate the link between socio-economic status, measured through a self-perceived economic position and level of education, and the subjective health status of an individual.

Materials and Methods

An extensive questionnaire application, combined with the results of current medical examinations and data from personal medical records, was the methodological framework of this study, which was conducted on a representative national sample. The data were administered by trained public health/community nurses in face-to-face interviews at participants' homes.

Health status was assessed with the *Short Form 36 Health Survey* questionnaire (*SF-36*)[14]. It has been designed to be short enough and practical for use in large-scale studies. Although it was developed for clinical applications, *SF-36* is designed as a general outcome measure, which attempts to measure aspects of health that are important to all patients, and so is readily applicable to the general population. The questionnaire contains 36 items that, when scored, yield 8 domains: *Physical Functioning – PF* (10 items) assesses limitations in physical activities, such as walking and climbing stairs; the *Role Physical – RP* (4 items) and *Role Emotional – RE* (3 items) domains measure problems with work or other daily activities as a result of physical health or emotional problems; *Bodily Pain – BP* (2 items) assesses limitations due to pain; and *Vitality – VT* (4 items) measures energy and fatigue; the *Social Functioning* domain – *SF* (2 items) examines the effect of physical and emotional health on normal social activities; *Mental Health – MH* (5 items) assesses psychological distress and well-being, measuring happiness, nervousness and depression; the *General Health Perceptions* domain – *GH* (5 items) evaluates personal health in general. For the summary measures, scales *PF, RP* and *BP* refer to the general measure of physical health, scales *SF, RE* and *MH* measure psychological health, and scales *VT* and *GH* represent global measures of health in general.

All results were transformed, and a score was calculated for 8 dimensions of health on a scale from 0 to 100, with 0 representing the worst and 100 the best possible health state. In this research, a Croatian version of the SF-36 was used[15,16]. Socio-demographic characteristics were covered with ordinary items on age and gender, and socio-economic status was defined as a self-perceived economic status measured on a 5-point scale (from 1, »much worse than average«, through 3, »average«, to 5 »much better than average«) and level of education measured in years of schooling (from 1, »fewer than 8 grades of elementary school«, to 5, »college or university degree«).

Cardiovascular risk factors were covered with questions on having diagnosed high blood pressure, high cholesterol or high blood sugar. The presence of these conditions was registered according to the participant's statement or available data from personal medical records.

Biometric characteristics of weight and height were measured by the nurses themselves.

In addition, self-reported specific health behaviors were assessed as follows: healthy nutritional habits, which include regularity of eating breakfast, fruit and vegetables, and regularity of adding salt to food; frequency of alcohol drinking; physical activity as 30 minutes or more of physical activity every day; past and present smoking.

This study was a part of a brother research – the Croatian Adult Health Survey (CAHS), which covered a wide range of health-related variables, many of them analyzed and presented separately, in greater detail, in other papers in this special issue[13]. The survey targeted persons aged 18 years and over living in private dwellings in the Republic of Croatia, and the 2001 Croatian Census was used to select a representative national sample of households. The method of multi-stage stratified sample design selected 10,766 households as a starting point for data gathering. Out of the total number of 10,766 selected households, responses were obtained from 9070 individuals (6180 women and 2890 men), which gives an overall response rate of 84.3%. The average age was 53.96 years (SD = 17.02), ranging from 18 to 101 years.

From the total number of 9070, we defined two samples of respondents with respect to cardiovascular risk factors: (1) a healthy group of individuals who did not state the presence of any covered chronic disease or disorder (N=1,817 or 20% of the total sample), and (2) a risk group of individuals who stated having high blood pressure or high blood cholesterol or high blood sugar (N=360 or 4% of the total sample).

Results

We compared the healthy and risky groups in socio-demographic characteristics (age, sex, economic status and level of education), body mass index (BMI), and several aspects of health behavior (nutrition habits, actual smoking status, past smoking experience, actual habits of alcohol drinking and regular physical activity (Table 1). The observed groups did not differ in self-assessed economic status or gender structure. Significant differences were found in the average age and level of educa-

TABLE 1
DIFFERENCES BETWEEN TWO GROUPS OF SUBJECTS IN THE SOCIO-ECONOMIC CHARACTERISTICS, BMI AND HEALTH BEHAVIOR VARIABLES: HEALTHY INDIVIDUALS WITHOUT THE CARDIOVASCULAR RISK FACTORS (N=1,817) AND INDIVIDUALS WITH CARDIOVASCULAR RISK FACTORS (N=364)

	Healthy group		Group with risk factors			
	Male	Female	Male	Female	Mann-Whitney	*p*
Sex	83.4%	81.2%	16.6%	18.8%	–1.99	0.05
	M	SD	M	SD	t-test	*p*
Age	40.14	15.43	56.52	13.99	–20.0	0.00
Economic status[a]	2.77	0.94	2.69	0.90	1.62	0.11
Level of education[b]	3.02	0.98	2.83	1.10	3.05	0.00
BMI	24.59	4.26	27.65	4.47	–11.99	0.00
Breakfast[c]	2.39	0.70	2.44	0.75	–1.07	0.29
Salt[d]	2.40	0.66	2.56	0.62	–4.54	0.00
Fruits[e]	2.86	0.91	3.02	0.90	3.13	0.00
Vegetables[e]	2.83	0.48	2.83	0.42	0.20	0.84
Actual smoking[f]	1.62	0.90	1.36	0.75	4.49	0.00
Past smoking[g]	1.76	0.90	1.63	0.92	2.35	0.02
Actual alcohol drinking[h]	8.15	3.45	8.72	3.57	–2.32	0.02
Physical activity[i]	6.26	2.43	5.99	2.48	1.95	0.05

Legend– 1(much worse than an average) – 5(much better than an average); b – 1(less than 8 grades of elementary school) – 5(high school or university diploma); c – 1(yes regularly) – 3(never eat breakfast); d – 1(almost always) – 3(never adding salt to a meal); e – 1(never) – 4(every day); f – 1(not at all) – 3(every day) : g – 1(never) – 3(every day more than 5 years); h – 1(never any) – 24(every day wine, beer and strong spirits); i – 1(nothing any) – 12(more than 30 minutes of an intensive physical activity every day).

tion – the individuals with cardiovascular risk factors were older and less educated. Their average BMI was above the value of 25 and significantly higher than the average of the group without the cardiovascular risk factors. Both groups showed similar nutritional habits – on average, they were not used to eating fruit and vegetables more than sporadically, but the group with the cardiovascular risk factors ate significantly more fruit. Both groups usually ate breakfast, but the CV risk group ate less salt. Individuals with stated CV risk factors smoked less, on average, than the healthy individuals, and had similar smoking experience. Most individuals in both groups were not smokers in the past or had smoked on a daily basis for no more than 5 years. However, the healthy group had significantly more individuals who smoked in the past. When we selected the past smokers, then the results were different: among the individuals who had smoked every day for more than 5 years, there were significantly more of those with the stated cardiovascular risk factors (Mann-Whitney test = 4.54; p=0.000). Such results imply a long-term and cumulative effect of smoking on the presence of cardiovascular risk factors. The group with cardiovascular risk factors drank more alcohol than the healthy group, and showed a tendency to practice less physical activity (borderline significance of the t-test value).

Figure 1 shows the average SF-36 profiles of the two groups. We used MANCOVA to test the differences in the average levels of those profiles. As significant determinants of subjective health, the covered socio-demographic variables (age, sex, economic status and level of education) were used as covariates. Accordingly, the profiles presented are defined by adjusted means values – they were differentially weighted with respect to socio-demographic differences between the samples, and this procedure reduced the differences between the two samples. In spite of that, a significant difference was found in the average level of SF-36 profile between the individuals of different status of CV risk factors – the group with CV risk factors showed an average lower level of subjective health status than the healthy group (F=5.724; p=0.000). The univariate statistical tests showed that two health

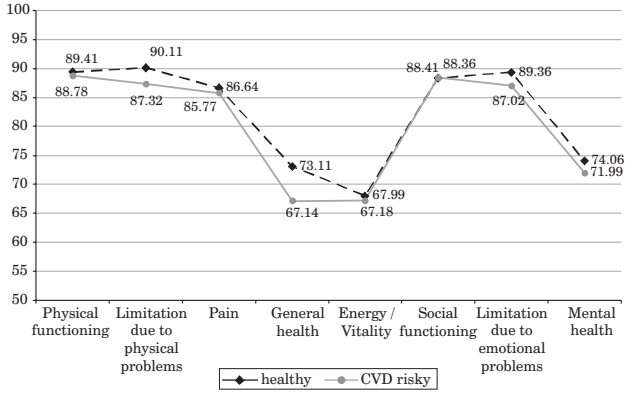

Fig. 1. The SF-36 profiles of individuals without cardiovascular risk factors (N=1,817) and individuals with cardiovascular risk factors (N=364).

dimensions contributed significantly to the difference: general health (F=33.665; p=0.000) and mental health (F=4.453; p=0.035).

Bivariate *Pearson's* correlations between the searched variables and their significance are presented in Table A in the *Appendix*. We can observe a tendency of positive relations between different desirable, as well as undesirable, aspects of health behavior, but the correlations are not very high (ranging from –0.05 between salt-avoiding and past smoking, which was barely significant, to 0.28 between fruit- and vegetable-eating). Women, older people and those of better socio-economic status showed healthier lifestyles. Various aspects of the cumulative SF-36 health aspects are positively related: *Pearson's* coefficients ranged from 0.51 between physical and general health to 0.62 between general and psychological health. The socio-demographic characteristics show expected significant correlations with different aspects of health, but this is not the case with the behavior variables. Only a few of them correlated significantly with subjective health status, and the correlations were not impressive (ranging from 0.05 between avoiding salt, as well as fruit-eating, and general health, to 0.11 between vegetable-eating and general health). Physical activity is an exception. This variable correlated significantly with all three aspects of health: 0.17 with physical health, 0.14 with general health and 0.09 with psychological health. Examined bivariate correlations showed the same tendency in the group of subjects with stated cardiovascular risk factors, but they were even weaker and rarely significant.

A hierarchical regression analysis was conducted to test the validity of the measured health behavior in predicting individual differences in subjective health status in the group of healthy individuals. The same procedure was not conducted for the cardiovascular risk group, because of the lack of significant relations between the searched predictors and criteria. Socio-demographic characteristics (age, sex, economic status and level of education), body mass index (BMI) and measured aspects of health behavior (eating habits, present smoking status, past smoking experience, actual habits of alcohol drinking and regular physical activity) served as predictors and were put into the analyses in three separate steps. Total physical, general and psychological health status served as the criterion variables, and the main results of the regression analyses are presented in Table 2. Examined predictors explained a significant number of individual differences in physical, general and psychological health status. The total adj. R^2 value ranged between 4% of the total variance when the criterion was psychological health, and 10% when the criterion was physical health. In that process, individual differences socio-demographic variables measure played the most important role. However, health behavior variables showed a significant role in predicting all three aspects of subjective health: a level of regular physical activity significantly explained the variance of all three health aspects, salt avoidance significantly explained the variations in physical health status, individual differences in breakfast con-

TABLE 2
RESULTS OF HIERARCHICAL MULTIPLE REGRESSION ANALYSES FOR INDIVIDUALS WITHOUT CARDIOVASCULAR RISK FACTORS (N=1,817)

Predictors	Standardized partial regression coefficients (β)*		
1st step	PHYSICAL HEALTH	GENERAL HEALTH	MENTAL HEALTH
SOCIO-ECONOMIC			
Age	–0.20**	–0.17**	–0.09**
Gender	–0.11**	–0.09**	–0.07*
Economic status	0.07*	0.13**	0.10**
Level of education	0.09**		
Adjusted R^2	0.07**	0.07**	0.02**
2nd step			
SOCIO-ECONOMIC			
Age	–0.18**	–0.17**	–0.09**
Gender	–0.12**	–0.09**	–0.07*
Economic status	0.07*	0.13**	0.10*
Level of education	0.08*		
BMI	–0.06*		
Adjusted R^2	0.08**	0.07**	0.037**
ΔR^2	0.003*	0.000	0.02**
3rd step			
SOCIO-ECONOMIC			
Age	–17**	–0.15**	–0.07*
Gender	–0.14**	–0.13**	–0.12**
Economic status	0.08*	0.12**	0.09**
Level of education	0.07*		
BMI	–0.08*		
HEALTH BEHAVIOR			
Breakfast		0.06*	
Salt	–0.08*		
Fruits		0.08*	
Actual alcohol drinking			–0.07*
Physical activity	0.15**	0.13**	0.08*
Adjusted R^2	0.10**	0.09**	0.04**
ΔR^2	0.03**	0.03**	0.02*

* Only significant predictors are presented

sumption and fruit eating were related to general health, and alcohol drinking was an independent predictor of psychological health status.

Discussion

Subjective experience of one's own health may differ from objectively diagnosed conditions, so people with evident risks can still feel physically and mentally well. Our examined group of people with diagnosed CVD risk conditions was older, had less education and reported poorer subjective health in comparison to the healthy group. When adjusted for socio-demographic characteristics, those two groups still differed in self-assessed health status. At the level of specific health dimensions, the group with CVD risks reported significantly lower general and mental health. But they reported healthier behaviors at the present time. This indicates that recommended health behavior was applied when health problems appeared, but not for preventive purposes.

We analyzed the measured health behaviors in predicting individual differences in the physical, mental and general health of the healthy group. Physical activity was revealed as a significant predictor of all three aspects of subjective health. Nutritional habits significantly explained physical and general health, and alcohol consumption contributed significantly to explaining mental health. Socio-economic variables of age, gender and self-assessed economic status contributed significantly to explaining all three aspects of subjective health.

The participants in our survey differed significantly in various well-established risk factors, although not

consistently in direction. The group without CVD risks differed from the group with risks according to their nutritional habits. Although they ate breakfast more regularly, other nutritional habits that they reported were not so healthy. One important healthy nutrition habit is related to adding salt to food. Our groups differed according to this indicator, but in a different direction. The group with CVD risks had a lower intake of sodium. Further analysis revealed that, in the healthy group, adding salt was a significant negative predictor in explaining the summary measure of physical health. The better present nutritional habits observed and the fewer actual smokers in the stated risk group imply a tendency to improve health behavior after the bad consequences of the individual lifestyle and unhealthy behaviors are proved by objective blood tests.

Our results revealed that the healthy participants' BMI was within the normal range, whereas the CV risk group had significantly higher BMI, being in the overweight range. BMI is an objective measure, and it includes a whole scope of different behaviors and habits, from food to physical activity. Our healthy group was more physically active than the group with risks, which is supposed to contribute to their normal weight. However, those in the group with CV risks were on average 16 years older, which may explain the lower physical activity in that group, so a clear conclusion could not be drawn without further multivariate analysis of the results, planned in ongoing project activities.

Our participants differed significantly according to educational level, but not in self-assessed economic status. Healthy participants had higher education than those with CVD risks. It is known that higher education is usually connected with better self-perceived health, but also with lower health risks and the taking of more preventive measures. Usually, higher education is connected with higher socio-economic status, but we did not find a difference regarding that indicator between the two groups of participants. The whole curve of self-perceived economic status is shifted towards lower values, and that reflects the perception of Croatian citizens regarding their financial welfare. However, economic status was a significant predictor in explaining all three summary measures of health (physical, mental and general) in the healthy group. The related finding that education was a significant predictor of physical health can be explained in a way that people with better education have more resources available for choosing and acquiring a recommended healthier lifestyle. Another notable risk factor is alcohol, although moderate consumption of alcohol is considered as a protective factor for CVD. For example, a study from Poland found a 40% lower relative risk of cardiovascular death among males who moderately consumed alcohol, and a 40–70% lower CV risk for females compared with the abstinents[17]. On the other hand, high alcohol consumption is a health threat. Our healthy participants reported drinking alcohol, but they drank less often than those with risks, and the measure of frequency of alcohol drinking was revealed to be significant in explaining their mental health. More frequent alcohol consumption is related to poorer mental health. According to their self-reports, participants with diagnosed conditions that are known CVD risks smoked less than healthy participants. Diagnosed medical problems often lead to healthier habits, but the difference found also implies cumulative negative effects of smoking on health.

We found a significant correlation between risk or health behaviors and subjective health status, but, contrary to our starting assumptions, measured lifestyle variables did not mediate any impact of individual socio-demographic characteristics on subjective health. Our results also imply a significant role of health behavior in predicting self-perceived physical, general and psychological health status, even in situations where the same variables were not helpful in differentiating individuals with and without current cardiovascular risks, defined by high blood pressure, high blood sugar or high blood cholesterol. Lifestyle and health behavior is a significant factor in individual health status, in spite of which our subjects showed a tendency to use healthy habits in everyday life just as a curative method, when they knew or felt that they already had impaired cardiovascular health. Studies have shown that the risk of suffering poor health and death from CVD can decrease dramatically with lifestyle improvements and the effective application of preventive treatments currently available[18]. Physical activity has many benefits to human health. The positive influence of physical activity has been observed for not only physical health but also mental health and perceived general health. Healthy participants are more physically active than those with risks, and regularity of physical activity was a significant predictor of all three summary measures of health (physical, mental and general) in their group. Those findings may have some implications for local general health recommendations.

Our study indicates that health behaviors and lifestyle factors, such as regular physical activity and healthy nutritional habits, significantly predicted health. So, interventions and programs that target physical activity were promising in health promotion at the population level. However, simple knowledge of health behaviors and desirable life styles does not lead directly to behavior change. An empirical study of the antecedents of preventive health care behavior suggests that preventive health care behaviors are strongly influenced by the value individuals perceive in engaging in such actions. Such value is greatly affected by the person's belief that a specific action will mitigate the health threat. Additionally, health motivation and health consciousness are also shown to influence preventive health care behaviors[19].

There is a limitation of this study in that it was cross-sectional, and therefore no causal inferences can be made. Many measures were self-reported behaviors, and reports on nutritional habits were based on the memories of the participants. Taking into account that community nurses were the interviewers, it is likely that this influenced the participants' answers. Since the analyzed variables were extracted from a larger survey database,

we have been limited by the existing data, and different questions regarding nutrition could reveal different results. In accordance with this, we consider a development of valid survey methods regarding nutritional and other relevant lifestyle habits to be a priority task for the future.

Conclusion

Participants with existing CVD risk factors showed worse health, but healthier behaviors, at the present time. This indicates that recommended health behavior was applied when health problems appeared, but not for preventive purposes. Our findings emphasize that psychological, physical, and social factors are inextricably linked in maintaining cardiovascular health, showing the importance of targeting health-related behaviors, especially physical activity, in preventive strategies and programs.

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KARDIOVASKULARNI RIZICI I RIZIČNA PONAŠANJA U ODNOSU NA SAMOPROCIJENJENO ZDRAVSTVENO STANJE

Svrha ovog istraživanja bila je istražiti biomedicinske rizične faktore i zdravstveno rizično ponašanje u odnosu na samoprocijenjeno fizičko, mentalno i opće zdravlje na uzorku odrasle populacije u Hrvatskoj. Subjektivni doživljaj zdravlja i zdravstveni status mjeren je upitnikom SF-36. Odgovori su dobiveni od 9070 ispitanika koji su podijeljeni u dvije skupine u odnosu na kardiovaskularne rizike: 1) zdrava skupina koja je uključivala ispitanike koji nisu naveli postojanje niti jedne kronične bolesti ili poremećaja (N= 1817) i 2) skupina ispitanika s postojećim kardiovaskularnim rizikom (visoki krvni tlak, masnoće i/ili šećer u krvi) (N=360). Navedene dvije skupine razlikuju se u zdravstvenom profilu subjektivnog doživljaja zdravlja. Skupina s rizicima navodi statistički značajno lošije stanje na dimenziji mentalnog zdravlja i općeg zdravlja, ali im je sadašnje zdravstveno ponašanja zdravije. U zdravoj skupini, analizirali smo koliko mjere rizičnog ponašanja mogu objasniti sumarnu mjeru fizičkog, mentalnog i općeg zdravlja. Fizička aktivnost se pokazala značajnim prediktorom sve tri mjere zdravlja. Socio-ekonomske karakteristike (spol, dob i samoprocijenjeno ekonomski status) imale su značajan doprinos u objašnjenju sva tri aspekta zdravstvenog statusa. Rezultati ovog istraživanja ukazuju na povezanost psihičkih, fizičkih i socijalnih faktora i njihovu važnost u održavanju dobrog zdravlja. Naglašava se važnost ponašanja vezanog za zdravlje a posebice fizičke aktivnosti kao važnog dijela preventivnih strategije i programa.

Appendix

TABLE A
BIVARIATE PEARSON'S CORRELATIONS BETWEEN THE SEARCHED VARIABLES*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Sex	–	–0.06**	–0.01	0.01	–0.20**	–0.03	0.21**	0.17**	0.18**	–0.13**	–0.18**	–0.45**	–0.04	–0.02	–0.07**	–0.02
2 Age	–0.09	–	–0.10**	–0.25**	0.31**	0.01	0.05*	–0.01	0.04	–0.07**	0.11**	0.24**	–0.11**	–0.24**	–0.22**	–0.13**
3 Economic status	–0.02	–0.03	–	0.32**	–0.03	0.10**	0.00	0.12**	0.11**	–0.05*	–0.02	0.01	0.09**	0.13**	0.17**	0.15**
4 Level of education	–0.18**	–0.19**	0.27**	–	–0.17**	0.06*	0.03	0.16**	0.19	–0.03	–0.04	–0.04	0.10**	0.16**	0.16**	0.11**
5 BMI	–0.05	0.05	0.08	–0.05	–	0.00	–0.00	–0.05*	–0.01	–0.08**	0.05*	0.18**	0.01	–0.08**	–0.06**	–0.03
6 Breakfast	–0.04	0.11*	0.03	–0.04	–0.04	–	0.06**	0.12**	0.06**	–0.19**	–0.15**	–0.01	0.06**	–0.04	0.05*	0.04
7 Salt	0.25**	0.12*	0.05	–0.02	0.03	0.06	–	0.12**	0.11**	–0.10**	–0.05*	–0.18**	0.01	0.02	0.05*	0.03
8 Fruits	0.11*	0.11*	0.09	0.03	–0.02	0.12*	0.10	–	0.28**	–0.12**	–0.09**	–0.08**	0.10**	0.01	0.11**	0.09**
9 Vegetables	0.15**	–0.05	0.12*	0.16**	–0.06	0.02	0.10	0.18**	–	–0.05	0.00	–0.01	0.11**	0.06*	0.03	0.08**
10 Actual smoking	–0.05	–0.16**	0.05	0.03	–0.07	–0.26**	–0.13*	–0.05	0.08	–	0.66**	0.10**	0.00	0.01	0.00	–0.01
11 Past smoking	–0.10	–0.11*	0.07	0.09	–0.03	–0.14*	–0.07	0.00	0.06	0.60**	–	0.17**	0.00	–0.04	–0.02	–0.02
12 Alcohol drinking	–0.39**	0.03	0.02	0.00	–0.06	0.06	–0.22**	–0.13*	–0.05	0.00	0.00	–	0.06*	–0.03	–0.04	–0.03
13 Physical activity	–0.11*	–0.25**	0.11*	0.18**	0.05	0.05	–0.07	0.13*	0.12*	0.10	0.05	0.14*	–	0.17**	0.14**	0.09**
14 Physical health	–0.02	–0.23**	0.07	0.13*	–0.04	–0.08	–0.02	–0.02	0.06	0.05	0.13*	0.05	0.18**	–	0.46**	0.50**
15 General health	0.00	–0.09	0.17**	0.19*	0.01	–0.01	0.08	0.05	0.10	0.00	0.08	0.00	0.12*	0.51**	–	0.61**
16 Psychological h0.	–0.05	–0.05	0.06	0.18	–0.01	–0.02	0.13*	0.04	0.12*	–0.02	0.03	0.02	0.07	0.53**	0.62**	–

* The healthy group (N=1,817) is above the diagonal; the CV risks group is under the diagonal (N=364).