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## Coronary heart disease from a psychosocial perspective

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# **Psychosocial factors of coronary heart disease and quality of life among Roma coronary patients: a study matched by socioeconomic position<sup>4</sup>**

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<sup>4</sup> Submitted

## **Abstract**

### *Objective:*

Roma have been shown to have an adverse socioeconomic position and unfavorable health. The high occurrence of coronary heart disease (CHD) is an important aspect of this adverse health, but very little is known about more specific issues, such as quality of life and psychosocial factors among Roma. The aim of this study was to assess whether psychosocial factors and health-related quality of life (HRQL) differ between Roma and non-Roma coronary patients and to what degree socioeconomic position explains these differences.

### *Design:*

We interviewed 399 patients from the Eastern Slovakia, 38 of whom were Roma, who had been referred for coronary angiography. We included 114 participants in the study: 38 Roma patients, all with low socioeconomic status (SES), 38 non-Roma with low SES, and 38 non-Roma with high SES. Groups were selected randomly after matching for age, gender and education. The GHQ-28 was used for measuring psychological well-being (anxiety, depression), the Maastricht interview for vital exhaustion, the type-D questionnaire for personality, the Cook-Medley scale for hostility and the SF-36 for HRQL. SES was measured by education and income and disease severity by functional status and ejection fraction. ANOVA and linear regression were used to analyze the data.

### *Results:*

Differences were found between Roma and non-Roma in psychological well-being and vital exhaustion, where Roma scored worse compared to non-Roma ( $p \leq 0.001$ ,  $p \leq 0.001$ ), but with regard to personality characteristics, ethnicity played a less significant role. Roma also scored worse than non-Roma in HRQL ( $p \leq 0.001$ ). The differences between Roma and non-Roma could be partially explained by SES.

### *Conclusion:*

The adverse HRQL, psychological well being and vital exhaustion of Roma coronary patients may warrant additional care. This care should target their low SES but also other factors related to their ethnic background, such as culture and living conditions.

## **Introduction**

Roma are an ethnic group which originated in India and which entered Europe in the 14<sup>th</sup> – 15<sup>th</sup> century. Most of the Roma in the European Union live in Central and Eastern Europe (Kosa *et al.* 2007, Crowe 1995). The history of Roma in this region is characterized by several periods of

repression and discrimination, the most pronounced occurring during World War II when a large part of the Roma population was exterminated in Nazi concentration camps (Vivian & Dundes 2004, Barondess 1998). During the Communist era, state policy was focused on re-educating and assimilating Roma into the majority population. Roma received many social benefits but were also forced to abandon their traditional itinerant style of life and were discouraged from identifying with their original cultural background and their language. This state policy failed to achieve its aims and instead led to increased social passivity and cultural distrust of outsiders among the Roma population, both of which persisted also after the fall of Communism. Societal transformation in the 1990s brought with it many socioeconomic changes, most of which had a negative impact on Roma: i.e. an increase in racist sentiment against Roma, the loss of social welfare from the government (Zeman *et al.* 2003, Koupilova *et al.* 2001). In Slovakia, Roma are the second most numerous ethnic minority (after Hungarians). In the 2001 census, 1.7% of the total population declared themselves to be Roma. This figure depends, however, on self-identification, and the actual number of Roma according to the estimates of the Demographic Research Centre is substantially larger, at around 380,000 (7.2%), with the largest numbers of Roma living in the Eastern regions of Slovakia (Vaňo 2001).

In their review, Hajioff and McKee (2002) concluded that research on Roma health issues is scarce and is largely focused on communicable diseases. Little is known about the epidemiology of chronic diseases among this group. The limited evidence suggests increased morbidity from non-communicable disease, poorer access to health services, lower uptake of preventative care, worse overall health status and a higher prevalence of various risk factors among the Roma compared to the non-Roma population (Kosa *et al.* 2007, 2002, Nesvadbova *et al.* 2000). A significantly lower life expectancy has also been reported (Koupilova *et al.* 2001, Filadelfiova *et al.* 2007).

There are few reports on Coronary Heart Disease (CHD) among Roma. Nozdrovicky (in Koupilova *et al.* 2001) reported cardiovascular diseases as the most common cause of death in the Roma community of Rakusy in Slovakia. Lifestyle risk factors had a high prevalence (high consumption of animal fat and low consumption of fruit and vegetables, obesity, very high prevalence of smoking and alcohol consumption as well as lack of physical activity). Another study (Dejmek *et al.* 2002) indicated an unfavorable diet and smoking habits among Roma pregnant women, with about 78% of Roma mothers reporting smoking as compared with 31% of non-Roma mothers. Other studies confirm the higher prevalence rate of risk factors and of coronary heart disease, metabolic syndrome and Type 2 diabetes among the Roma compared to non-Roma (Vojarova de Courten *et al.* 2003, Krajcovicova-Kudlackova *et al.* 2002).

In research on Roma health issues, it often remains unclear to what extent worse health among Roma is influenced by their very low socioeconomic status, or whether other ethnicity-related factors such as different attitudes towards health and different lifestyle are more important. Studies comparing Roma with the majority population have shown that Roma often do not perceive the connection between lifestyle and health as strongly causal, and that health and disease are in the hands of destiny anyway and are rather stoically and fatalistically accepted (vanCleemput *et al.* 2007, Petek *et al.* 2004). Data on CHD among Roma are sparse, and even less is known about psychosocial factors and quality of life among Roma coronary patients. The role of these factors in CHD has been widely studied and has showed their importance in both the etiology and prognosis of CHD (Bobak & Marmot 2005, Kop 2003). Depression, anxiety and vital exhaustion are among the most commonly reported variables connected to increased CHD morbidity and mortality risk, (Appels *et al.* 2006, Brummet *et al.* 2005, Williams & Schneiderman 2002), together with a Type-D personality (Denollet 2005) and hostility (Kuper *et al.* 2005, Boyle *et al.* 2004). Health-related quality of life (HRQL) comprises physical, mental, social and economic components and evaluates mainly the physical and mental status of patients as a reflection of their disease. HRQL is a factor of high clinical relevance, and in several studies it has been found to be an important predictor of general and cardiovascular mortality and morbidity even after adjustment for other conventional risk factors (Lenzen *et al.* 2007).

The aim of this study was to assess whether psychosocial factors and health-related quality of life differ between Roma and non-Roma CHD patients, and to what extent socioeconomic position explains these differences. Based on the previous studies on Roma health, and bearing in mind the specific cultural and social background of this group, significant differences were expected between Roma and non-Roma coronary patients regarding these factors.

## **Methods**

### *Study participants and procedure*

We interviewed patients who had been referred to the East Slovakian Institute for Cardiac and Vascular Diseases in Kosice for coronary angiography (CAG). Patients with cardiovascular disease from the all of Eastern Slovakia (about 1.5 million inhabitants) are referred to this medical centre for diagnosis and treatment. From 399 patients interviewed (a response rate of 94.8%), 38 patients had Roma ethnicity. We included 114 participants in this study and divided them into three groups: 1<sup>st</sup> group - 38 Roma patients, almost all with low socioeconomic status (SES); 2<sup>nd</sup> Group - 38 non-Roma patients with low SES (randomly matched with

Roma in terms of education, age, gender and type of intervention after CAG); 3<sup>rd</sup> group - 38 non-Roma patients with high SES randomly matched with the first group in terms of age, gender and type of intervention after CAG. The type of intervention after coronary angiography, which is a general indicator of the seriousness of the disease, was divided into three categories: 'pharmaceutically', or 'PTCA (Percutaneous Transluminal Coronary Angioplasty)', or 'CABG' (Coronary Artery Bypass Grafting). General inclusion criteria in the study were as follows: coronary heart disease (CHD) in the medical history, age < 75, no psychiatric disorders in the medical history and no serious co-morbidity. Participants were provided with information about the study, and they signed an informed consent letter. Ethical approval for this study was obtained from the Ethics Committee. The response rate was 94.1%, and there were no significant differences between respondents and non-respondents in age or gender. A structured interview was conducted with each patient by a trained interviewer, and medical data were obtained from the medical records of patients.

#### *Measures*

##### **Psychological well-being**

To assess psychological well being, the 28 item version of the General Health Questionnaire (GHQ-28) was used (Goldberg & Hillier 1979). The GHQ 28 consists of 4 subscales: physical symptoms, anxiety and insomnia, impairment of social functioning, and depression. The score for each subscale ranges from 0 to 21, and the total GHQ 28 score is between 0 and 84, with a higher score indicating worse mental health status. The questionnaire has been shown to have acceptable consistency and validity (Goldberg & Williams 1988). The good psychometric properties of the Slovak version of the GHQ 28 have also been reported (Nagyova et al. 2000). In the present study the Cronbach's alpha was 0.92.

##### **Vital exhaustion**

The structured Maastricht Interview for Vital Exhaustion measures feelings of exhaustion and consists of 23 questions concerning experiences such as tiredness, lack of energy, irritability, or disrupted sleep (Meesters & Appels 1996a). The score ranges from 0-46. The cut-off point at 17 or higher identifies a participant as 'exhausted'. The scale has been found to have good psychometric properties of validity and reliability (Meesters & Appels 1996b). In the present study the Cronbach's alpha was 0.87.

##### **Type-D personality**

Type-D personality was measured with the 14-item Type-D Personality Scale (DS14). Type-D personality is characterized by the tendency to experience negative emotions and not express these emotions in social interactions. It consists of 2 subscales: negative affectivity (NA) and social inhibition (SI). A score of 10 or more on both subscales denotes those

with a Type-D personality. The DS14 has adequate reliability and validity (Denolet 2005). In the present study Cronbach's alpha was 0.76.

### **Hostility**

Hostility was assessed using the 27-item version of the Cook Medley Hostility Scale, comprising three subscales – cynicism, aggressive responding and hostile affect – which are thought to reflect the cognitive, behavioral and mood components of hostility. This scale has been demonstrated as a good predictor of CHD and has acceptable validity and reliability (Barefoot *et al.* 1989). In the present study Cronbach's alpha was 0.71.

### **Health-related quality of life (HRQL)**

SF 36 was used to measure health-related quality of life. The four subscales of the SF-36 (vitality, emotional role limitations, mental health and social functioning) can be summarized into a mental functioning component summary, physical functioning, role limitations due to physical health problems and bodily pain, and general health perceptions can be summarized into a physical functioning component summary. The summary score ranges from 0 to 100, with lower scores indicating worse quality of life (Ware *et al.* 1994). A validation study of the SF-36 among coronary patients has confirmed good psychometric properties (Failde & Ramos 2000).

### **Socioeconomic status**

Income level and education were used as the indicators of socioeconomic status (SES). Participants' education was assessed as basic (including also unfinished basic education), middle (lower secondary without school-leaving exams and secondary with the graduation exams) and high (university education). Participants' income was divided into three levels: 1. low income (lower than the 'minimum wage'), 2. middle income (higher than the 'minimum wage'), and 3. high income (twice the 'minimum wage' and higher). 'Minimum wage' is an indicator of financial situation which is adjusted for the income of all family members. An official scheme for assessing minimum wage (prepared by the Slovak Ministry of Social Affairs) was employed. People with an income lower than the minimum wage are considered to live under the 'poverty level' and are entitled to receive social benefits.

### **Disease severity**

Disease severity was measured by functional status and ejection fraction. Functional status was assessed by a cardiologist based on two scales: NYHA - four classes according to the New York Heart Association classification of dyspnea symptoms (Criteria Committee of the NYHA 1994) and the Canadian Cardiovascular Society (CCS) checklist that assesses the severity of chest pain in four classes (Campeau 1976). In both scales, a higher classification represents a worse functional status. In this study functional status is calculated using the worst level from these two scales.

Ejection fraction (EF) as the measure of the systolic function of the left ventricle was indicated by echocardiography. EF may be reported as normal (>50%), borderline normal (40%-50%), or systolic dysfunction: mild (30%-39%), moderate (20%-29%), and severe (<20%) (McGowan & Cleland 2003).

### *Analysis*

We first described the demographic and basic medical characteristics of each group. Second, we used a one-way analysis of variance (ANOVA) and Scheffe post hoc tests in order to explore the differences in psychological variables and HRQL between groups (Roma, non-Roma with low SES and non-Roma with high SES). Next, hierarchical linear regression models (enter method) were employed to examine the effect of ethnicity on the psychological variables (psychological well-being, vital exhaustion, type-D personality, hostility) and HRQL. Age and gender were included in the regression models as potential confounding variables. In the next step, this regression model was adjusted for the effect of income and education. In the final model, functional status and ejection fraction were included to control for the potential effect of disease severity. Analyses were performed using SPSS 12.0.1 for Windows.

## **Results**

The mean age of participants in our study was 53.4 years, and 18% were women. These characteristics were similar in all 3 SES groups. Other sociodemographic characteristics of the research groups are presented in Table 1.



**Table 1.** Descriptive statistics

	Roma	non-Roma low SeS	non-Roma high SeS	Total study sample
<b>Total number</b>	38	38	38	114
<b>Age</b>				
Mean	53.1	53.4	53.8	53.4
SD	7.4	6.6	6.9	6.9
Range	27-71	39-64	38-72	27-72
<b>Gender</b>				
Males	31 (81.6%)	31 (81.6%)	31 (81.6%)	93 (81.6%)
Females	7 (18.4%)	7 (18.4%)	7 (18.4%)	21 (18.4%)
<b>Education</b>				
Unfinished basic	3 (7.9%)	-	-	3 (2.6%)
Basic	25 (65.8%)	27 (71.1%)	-	52 (45.6%)
Lower secondary	8 (21.1%)	8 (21.1%)	-	16 (14%)
Secondary (graduate)	1 (2.6%)	2 (5.3%)	-	3 (2.6%)
High (university)	1 (2.6%)	1 (2.6%)	38 (100%)	40 (35.1%)
<b>Income</b>				
Low	25 (67.6%)	3 (9.4%)	-	28 (27.2%)
Middle	9 (24.3%)	25 (78.1%)	14 (41.2%)	48 (46.6%)
High	3 (8.1%)	4 (12.5%)	20 (58.8%)	27 (26.2%)
<b>Ejection fraction</b>				
EF= 20- 29%	1 (3.1%)	2 (5.6%)	-	3 (2.9%)
EF= 30- 39%	7 (21.9%)	6 (16.7%)	2 (5.3%)	15 (14.6%)
EF= 40- 49%	7 (21.9%)	8 (22.2%)	9 (25.7%)	24 (23.3%)
EF= >50%	17 (53.1%)	20 (55.6%)	24 (68.6%)	61 (59.2%)
<b>Functional status</b>				
Class I.-II.	14 (38.9%)	19 (50.0%)	24 (63.2%)	57 (50.9%)
Class III.-IV.	22 (61.1%)	19 (50.0%)	14 (36.8%)	55 (49.1%)
<b>Seriousness of disease</b>				
Pharmacotherapy	13 (35.1%)	14 (36.8%)	13 (34.2%)	40 (35.4%)
PCI/ stent	8 (21.6%)	8 (21.1%)	11 (28.9%)	27 (23.9%)
CABG	16 (43.2%)	16 (42.1%)	14 (36.8%)	46 (40.7%)

Analysis of variance and Scheffe Post Hoc tests (Table 2) revealed differences between Roma patients, low-SES non-Roma patients and high-SES non-Roma patients. In *psychological well-being* Roma patients differed significantly from both non-Roma with low SES and non-Roma with high

SES. In *vital exhaustion* there were differences between all three groups, with Roma scoring higher than non-Roma with low SES and non-Roma with high SES, but differences were also found between non-Roma with low SES and non-Roma with high SES. In the *hostility* and *NA subscale of the Type D* questionnaire, only Roma patients and high-SES non-Roma differed significantly. In the *SI subscale of the Type D* questionnaire, as well as in the total score for type D, no statistically significant results were found. In both mental and physical components of *HRQL*, Roma patients scored significantly worse than non-Roma with low SES and non-Roma with high SES.

**Table 2.** Differences between research groups in psychological factors and HRQL tested with one-way analysis of variance (ANOVA) and Sheffe post-hoc tests.

	Group 1. mean	Group 2. mean	Group 3. mean	F value	p-value	Sheffe test- differences between groups
GHQ - total score	35.2	25.8	23.0	11.13	<b>0.001</b>	1-2, 1-3
Vital exhaustion	27.4	21.4	13.6	20.19	<b>0.001</b>	1-2, 2-3, 1-3
Hostility	17.8	15.6	14.2	7.60	<b>0.05</b>	1-3
Type D - NA	13.8	11.4	10.3	3.33	<b>0.05</b>	1-3
Type D - SI	13.2	12.6	11.2	1.48	0.23	-
Type D	-	-	-	1.72	0.18	-
SF 36 - mental component	49.2	61.6	65.1	7.54	<b>0.001</b>	1-2, 1-3
SF 36 - physical component	37.7	52.2	58.9	9.75	<b>0.001</b>	1-2, 1-3

- Group 1: Roma

Group 2: non-Roma with low socioeconomic status

Group 3: non-Roma with high socioeconomic status

- the higher the GHQ score, the lower the psychological well-being (anxiety, depression)

- a higher score in Hostility, Vital exhaustion and Type D indicate a higher level of the psychological trait

- the higher the SF36 score, the better the health-related quality of life

In the multivariate linear regression models containing age, gender and ethnicity, ethnicity was a significant predictor in almost all variables: psychological well being, vital exhaustion, hostility, and the physical and mental components of the HRQL. After the inclusion of income and education into the regression model, the effect of ethnicity disappeared in all the variables with the exception of the physical component of the HRQL and hostility. SES was significantly related to the following variables: psychological well-being, vital exhaustion and health-related quality of life. After the inclusion of functional status and ejection fraction, the influence of SES and ethnicity did not change significantly (Table 3).

Table 3. Effects of ethnicity on psychological variables and HRQL: results of a linear regression model.

	Equation 1 ethnicity $\beta$ (95% CI)	Equation 2 ethnicity adjusted for age, gender $\beta$ (95% CI)	Equation 3 ethnicity adjusted for age, gender SES $\beta$ (95% CI)	Equation 4 ethnicity adjusted for age, gender SES, FS, EF% $\beta$ (95% CI)
<b>GHO-28</b>	-0.42 (-15.47; -6.13)***	-0.43 (-15.63; -6.31)***	-0.20 (-10.80; 0.62)	-0.14 (-9.78; 3.76)
<b>Vital Exhaustion</b>	-0.43 (-13.59; -5.82)***	-0.43 (-13.42; -5.80)***	-0.11 (-6.75; 2.09)	-0.13 (-7.50; 1.53)
<b>Hostility</b>	-0.35 (-4.55; -1.26)**	-0.36 (-4.58; -1.25)**	-0.31 (-4.60; -0.40)*	-0.312 (-4.87; -0.30)*
<b>Type D</b>	-0.09 (-0.29; 0.11)	-0.08 (-0.29; 0.11)	-0.03 (-0.23; 0.29)	0.11 (-0.16; 0.39)
<b>SF-36 PHS</b>	0.39 (9.32; 26.45)***	0.40 (9.89; 26.74)***	0.27 (1.85; 22.30)*	0.24 (+0.05; 2.110)*
<b>SF-36 MHS</b>	0.36 (6.79; 21.74)***	0.36 (6.72; 21.84)***	0.17 (-2.77; 16.18)	0.13 (-4.71; 15.67)

## Abbreviations:

SES = socioeconomic status (income, education)

FS = functional status

EF% = ejection fraction

GHO-28 = General Health Questionnaire-28

SF36 PHS = physical health status, SF36 MHS = mental health status

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

## Discussion

### *Main findings*

Our study showed that Roma coronary patients had poorer scores than non-Roma patients on psychological factors that are relevant for the prognosis of coronary heart disease: psychological well-being (anxiety, depression) and vital exhaustion. Similarly, Roma scored worse in both the mental and physical components of health-related quality of life. However, these differences could be partially explained by the socioeconomic status of the Roma.

The design of our study enabled a proper assessment of the impact of SES and of other aspects of ethnicity on the outcome variables. For most variables (psychological well-being, vital exhaustion and HRQL) the impact of ethnicity in linear regression disappeared after the inclusion of socioeconomic status in the model (while SES was a significant predictor). Our results thus support the assumption that a significant part of ethnic inequalities in quality of life and psychological factors may be explained by the poor socioeconomic position of Roma. Socioeconomic disadvantage has been shown in numerous studies to be consistently associated not only with a higher presence of CHD lifestyle risk factors (heavier smoking, worse nutrition, higher levels of cholesterol), but also with a worse prognosis among coronary patients (Yarnel *et al.* 2005, Petrelli *et al.* 2006). However, it is necessary to take into account that the socioeconomic status of a considerably part of the Roma (especially those in separated settlements) is much lower than that of the majority population, with a much higher incidence of unemployment, criminality and dependency on government social welfare and very poor standard of living (Filadelfiova *et al.* 2007). In our sample, this was shown, for instance, by the fact that even in the low SES non-Roma group, income levels were higher than in the low SES Roma group. Furthermore, only among the Roma were there patients with an unfinished basic education. Because of this, SES as measured may not fully adjust for 'real' differences in SES.

One of the interesting findings in the study was that functional status in the three groups is quite different (table 1): the Roma have a higher prevalence rate of Class III and IV symptoms than both the low-SES non-Roma and the high-SES non-Roma, suggesting that the Roma might be more symptomatic from their disease than the non-Roma at referral to the cardiologist. With regard to personality traits, hostility seemed to be influenced by ethnic origin (higher scores among Roma), which is in line with some other studies where higher scores of hostility were found among ethnic minorities (Smart-Richman *et al.* 2007, Iribarren *et al.* 2000), most probably associated with the experiences of discrimination.

### *Strengths, limitations, directions for future research*

Major strengths of the present study are that it adds evidence to a rarely investigated topic – ethnic differences at the entrance of specialist care – and that we could distinguish between the impacts of SES and ethnicity on the outcome variables. However, due to our study's cross-sectional design, we could not further explore the mechanisms which might explain *how* SES is related to the psychological outcomes and HRQL among specific Roma population. Based on the literature, it might be hypothesized that chronic stress plays an important role, which can result in adverse health outcomes through biological, psychosocial and behavioral pathways. Higher stress events connected with enduring financial stress and a lower capacity to develop adaptive behavioral strategies for controlling psychosocial conflicts might be connected with poor SES (Kopp, Rethelyi 2004). Also other factors (social participation, social exclusion, feelings of discrimination) might be important in influencing the quality of life and psychological outcomes among Roma. Another limitation of the study was the relatively small number of Roma patients (38 from 399 interviewed patients, or 9.5%, which is quite characteristic for the population in Slovakia). The estimated proportion of Roma in the Slovak population is 7%, thus the slightly higher ratio of Roma in our sample may reflect the higher prevalence of CHD among the Roma. Results of the present study would benefit from confirmation in a longitudinal study with a bigger sample, which would also provide better insight into the causal relationships between the variables.

### *Conclusion and implications*

This study showed differences between Roma and non-Roma patients with coronary heart disease in psychological factors that are relevant for the prognosis (psychological well-being, vital exhaustion, HRQL). However, these differences were, to a significant extent, explained by SES, which supports the hypothesis of a significant impact of poor SES on ethnic inequalities in health among the Roma vs. non-Roma populations. These results may also apply to other ethnic minority groups with a backward societal position.

Roma patients may warrant a personalized intervention (respecting their cultural background and specific attitudes toward health issues) when enhancing quality of life, of which socioeconomic status appears to be a critical factor that needs to be taken into account.

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