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## Unraveling the role of sense of coherence in coronary heart disease patients

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*Document Version*

Publisher's PDF, also known as Version of record

*Publication date:*

2014

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

Silarova, B. (2014). *Unraveling the role of sense of coherence in coronary heart disease patients*. [Thesis fully internal (DIV), University of Groningen]. s.n.

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**Chapter 2**  
**Data Sources**

This chapter provides a general overview of the origin of the data (2.1), the study population and data collection (2.2), as well as the measures (2.3) and the statistical analyses (2.4) used in this study.

### 2.1 Origin of the Data

This thesis was based on data collected within the project “Social class and its impact on patients’ functional status and recovery process – 2009” (No. 275/2009-LF) and its precursor, the project “Social class and its impact on a patients’ functional status and recovery process after cardiological or cardiosurgical intervention.” Both projects were carried out as interdisciplinary studies by the University of Groningen, the Netherlands; PJ Safarik University in Kosice, Slovakia; and the East Slovakian Institute of Cardiac and Vascular Diseases in Kosice, Slovakia. The central themes in these projects were health differences between the Roma population versus the non-Roma population. More specifically, the projects focused on different psychosocial and medical aspects of quality of life among patients with CHD, and the protocol is designed to distinguish between influences originating from ethnicity and originating from SES. Furthermore, the studies focused on the rehabilitation process after cardiovascular surgery. In these projects, patients referred to the East Slovakian Institute of Cardiac and Vascular Diseases for coronary-angiography (CAG) are followed for 2 years.

This work was supported by the Slovak Research and Development Agency within the Longitudinal Research on Incapacitating Chronic Disease (LORIDIS) project (APVV-20-038305 and APVV-0220-10). The aim of this project is to gain deeper insight into the causal mechanisms occurring within the process of chronic disease management. Special attention is paid to the factors closely related to patients’ self-management, such as noncompliance, socioeconomic inequalities, ethnicity, ageing, social participation and coping (for more information see; <http://www.mc3.sk/?projects=1794-2>).

### 2.2 Study population and data collection

The study population consisted of patients who had been referred by their cardiologist for CAG in accordance with the European Society of Cardiology guidelines (2006), and who had an abnormal CAG. The study was conducted at the East Slovakian Institute for Cardiac and Vascular Diseases in Kosice, Slovakia, where patients from the whole East Slovakian region (about 1.5 million inhabitants) are referred to for diagnosis and treatment. Patients were enrolled in the research between November 2004 and December 2012.

Inclusion criteria were as follows: CHD in the medical history, no diagnosis of severe cognitive impairments in the medical history (e.g. dementia of the Alzheimer’s type, vascular dementia, amnesic

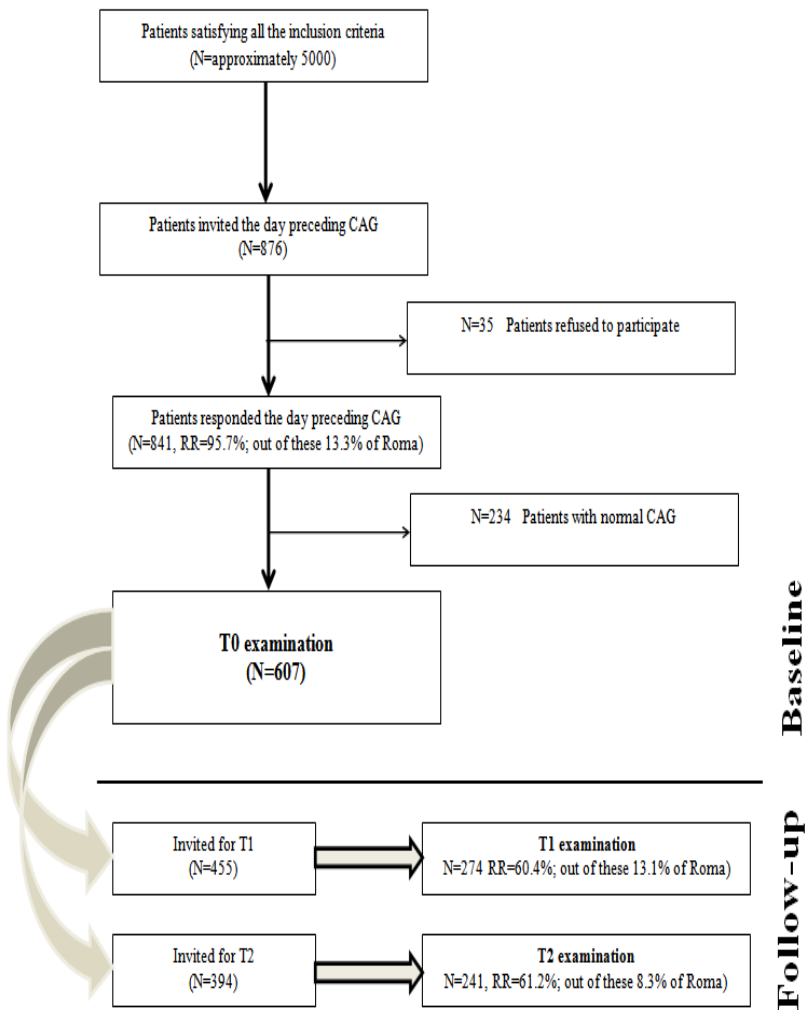
disorders or mental retardation) and no diagnosis of psychiatric disorders in the medical history (e.g. substance-related disorders, schizophrenia and other psychotic disorders or mood disorders including depressive disorder and bipolar disorder). Furthermore, only patients aged 75 years or less were included in this study, because above that age, mortality in a longitudinal design may be expected to be very high, as the life expectancy (in years) in Slovakia in 2004 was 70.3 years among men and 77.8 years among women. Choosing this cut-off as an inclusion criterion could potentially reduce loss at follow-up due to death. Additionally, patients with cardiovascular problems other than CHD (e.g. valve disease) and with a serious co-morbidity (such as malign tumours and nervous system diseases) were excluded, as well as patients with a normal CAG.

Data collection consisted of three measurements: a baseline measurement (the day preceding the CAG, T0) and the follow-up examinations: performed 3-6 months (T1) and 12-28 months (T2) after the CAG (Figure 2.1). The baseline measurement consisted of an interview conducted with each participant by a psychologist or trained research assistant during hospitalization for the CAG to obtain information about sociodemographic characteristics. Furthermore, during baseline examination medical data were retrieved from the medical records, and the day before CAG patients also completed a set of self-administered questionnaires on the studied variables. The type of therapeutic intervention following the CAG – PCI, CABG or pharmaceutical treatment – was determined by cardiologists based on the results of the CAG independently of participation in this study. For the follow-up examinations patients were invited individually via postal mail. The follow-up examinations consisted of a personal interview, a set of self-administered questionnaires and a medical examination (e.g. blood tests and electrocardiography).

Between November 2004 and December 2012 approximately 5000 patients scheduled to undergo CAG satisfied the inclusion criteria for this project. We randomly selected 876 of them as potential participants after pre-stratification by SES (measured by educational level: low, medium, high) to obtain equal numbers of these categories per stratum. Out of these, 35 patients refused to participate (4%), and 234 (27.8%) patients were excluded due to having normal CAG. Thus, the population at baseline consisted of 607 patients: 433 males (71.3%) and 174 females (28.7%), with ages ranging from 32 to 75 years (mean=58.0; SD=7.4); 15.4% of the baseline population was represented by Roma. However, as the five articles (Chapter 3-7) used in this thesis were written at different times during data collection, different populations are used in this thesis (Table 2.1).

The study was approved by the Ethics Committee of the East Slovakian Institute for Cardiac and Vascular Diseases in Kosice in November 2004. All participants were provided with information about the study and signed an informed consent statement prior to the study. Participation in the study was fully voluntary and anonymous, with no incentives provided for participation.

Figure 2.1 Flow-chart diagram of the participants



N=Number, RR=response rate, CAG=coronary angiography, PCI=percutaneous coronary intervention, CABG=coronary artery bypass grafting

**Table 2.1** Description of study population as used in the chapters

<b>Study population</b>	<b>Chapter 3</b>	<b>Chapter 4</b>	<b>Chapter 5</b>	<b>Chapter 6</b>	<b>Chapter 7</b>
Study design	longitudinal	longitudinal	cross-sectional	cross-sectional	cross-sectional
Data collection	179 patients measured at baseline and T2 time point	179 patients measured at baseline and T2 time point	509 patients measured at baseline	570 patients measured at baseline	570 patients measured at baseline
Time period	November 2004 - September 2008	November 2004 - January 2009	November 2004 - December 2012	November 2004 - June 2012	November 2004 - December 2012
Age: Mean (SD)	58.32±6.54	58.28±6.52	58.8±7.33	57.8±7.4	58.0±7.4
Sex					
Females: n (%)	34 (19.0%)	30 (16.8%)	149 (29.3%)	160 (28.1%)	174 (28.7%)
Ethnicity					
Roma: n (%)	7 (3.9%)	7 (3.9%)	0 (0%)	88 (15.4%)	98 (16.1%)

### 2.3 Measures

In this section an overview of variables and measures used in this study is given. The dependent variables were indicators of health-related behaviours (cigarette smoking, diet, physical exercise and alcohol intake), HRQoL (both mental and physical, the Short Form Health Survey Questionnaire, SF-36) and anxiety (Hospital Anxiety and Depression Scale, HADS).

The independent variables used in this study concerned a) sociodemographic characteristics: ethnicity (Roma vs. non-Roma), age, sex and SES (family income); b) clinical characteristics: functional status (the New York Heart Association - NYHA, Canadian Cardiovascular Society- the CCS) and the type of therapeutic intervention (pharmacotherapy, PCI, CABG); and c) intrapersonal characteristics: SOC (OLQ) and hostility (the Cook-Medley hostility scale, CMHS).

Additionally, SOC was used as a mediator in Chapter 5 and hostility as a mediator in Chapter 6. Brief information about the origin of the measures and a short description is given in Table 2.2; references are provided there as far as they apply.

### 2.4 Statistical Analyses

Several statistical methods were used across this study to analyse data. The majority of the analyses were performed using the statistical software package IBM SPSS for Windows, versions 16.0, 18.0 and 20.0 (IBM company, Chicago, Illinois, USA). Additionally, the cross-lagged analyses are described in Chapter 3 using Mplus 6.1 (<http://www.statmodel.com/>). Detailed information about statistical analyses performed can be found in the “Statistical analyses” section of each chapter.

Standard descriptive analyses regarding the studied variables were performed in Chapters 3-7. Chi-square tests were used in Chapters 3 and 7, Student’s t-tests (or Mann-Whitney U-tests) in Chapter 7 and analysis of variance (ANOVA, Kruskal-Wallis) were used in Chapter 3.

Logistic regression analyses were used in Chapter 3 and hierarchical linear models in Chapters 4, 5 and 7. The Sobel test (Aroian version) (Baron & Kenny, 1986) was used in Chapters 5 and 6. Cross-lagged analyses were used in Chapter 3.

**Table 2.2** Brief summary of variables and measurements used in this study

Construct	Measure	Type of variables (Chapters)	Short description
<b>Ethnicity</b>	Roma/non-Roma	Independent (Chapter 5, 7)	self-identification and by member of the research team
<b>Socioeconomic status</b>	Family income	Independent (Chapter 3, 4, 5, 7)	based on minimum wage income used within the social system in Slovakia*
<b>Functional status</b>	Combination of NYHA (Criteria Committee of the New York Heart Association, 1994) and CCS (Campeau, 1976)	Independent (Chapter 3, 4, 7)	NYHA - dyspnea symptoms (problems with breathing) CCS - severity of chest pain
<b>Type of intervention after CAG</b>	CABG PCI pharmacotherapy	Independent (Chapter 3)	coronary artery bypass grafting percutaneous coronary intervention pharmacotherapy
<b>Health-related behaviours</b>	a structured interview with questions assessing participants' cigarette smoking, diet, physical exercise and alcohol intake	Dependent (Chapter 3)	Indicator of health-compromising behaviour
<b>Hostility</b>	Cook-Medley hostility scale (Cook & Medley, 1954)	Independent (Chapter 5) Mediator (Chapter 6)	indicator of hostility comprising the subscales: cynicism, aggressive responding and hostile affect
<b>Sense of coherence</b>	the 13-item OLQ (Antonovsky, 1987)	Independent (Chapter 3, 4) Mediator (Chapter 5) Dependent (Chapter 7)	measure of meaningfulness, comprehensibility, and manageability
<b>Anxiety</b>	the 14-item HADS (Zigmond & Snaith, 1983).	Dependent (Chapter 7)	a self-assessment instrument for detecting clinically significant anxiety
<b>Health-related quality of life</b>	SF-36 (Ware et al., 1994)	Dependent (Chapter 4, 5, 6)	a generic measure of self-reported physical and mental HRQoL

\*Minimum wage is an indicator of the financial situation which is adjusted for the income of all family members according to the Slovak Ministry of Social Affairs (<http://www.employment.gov.sk/zivotne-minimum-od-172012.html>)



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