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## Coronary heart disease from a psychosocial perspective

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# General discussion, implications for future research and practice and conclusions

This thesis deals with socioeconomic and ethnic inequalities in psychological factors and in health-related quality of life among patients with coronary heart disease, as well as with psychosocial predictors of positive and negative changes in quality of life among patients with coronary heart disease (CHD). [I here copied in the first sentence of your introduction, to eliminate all possible discrepancies] The relationship between socioeconomic status (SES), ethnicity, psychosocial factors and coronary heart disease is a complex one and includes several direct and indirect pathways and a number of mediating factors: lifestyle, access to health care, physical and social environment, psychosocial factors and stress situations. Recognizing the complexity of proposed associations, we limited our focus in this study to one part of these relationships: on the association between socioeconomic position/ethnicity and psychosocial factors in coronary heart disease (CHD). In this final chapter, the main findings of the study are discussed within the context of what is already known in the field, and the implications for clinical practice are indicated. The strengths and limitations of the study are discussed, and the possibilities of directions for future research are addressed.

## 8.1. Main findings

### Research question 1.

Chapter 3 of the manuscript discussed the following research question: Is there evidence from the literature supporting the hypothesis of a socioeconomic gradient in the occurrence of psychosocial factors (like anger, depression, hostility, social support) among patients with coronary heart disease?

A review of the studies describing socioeconomic differences in coronary heart disease risk factors showed that socioeconomic status (educational and occupational grade, income level) was adversely associated with the psychosocial factors that contribute to coronary heart disease. With regard to hostility and depression, the socioeconomic

gradient was significant in all of the studies reviewed. Available studies also showed a similar trend in other factors: social support, perception of health and a lack of optimism. Results related to anger and perceived stress were less consistent: some of the studies included in the review reported contradictory results: no associations with socioeconomic position were found. Moreover, in the case of stress, a reverse relationship has also been found (higher stress has been reported in the higher socioeconomic group).

### **Research question 2.**

Chapters 4 and 5 provided answers to the following research questions: Are there socioeconomic inequalities in psychosocial factors (psychological well-being, perceived mental health status, perceived quality of life, vital exhaustion) among patients with coronary heart disease?

Socioeconomic status was found to be negatively associated with the psychological outcomes and perceived quality of life among CHD patients in the present study. Participants with low income or education had a higher probability of having poor psychological well-being, worse perceived mental health status and lower perceived quality of life compared to participants with high income or education. Participants with low socioeconomic status were also more likely to report higher vital exhaustion, but these SE differences were significantly more salient among men than among women. Associations between SES and psychological factors remained significant after controlling for the effect of medical variables.

### **Research question 3.**

Chapter 6 shifted the attention to the ethnic inequalities in psychosocial factors:

Are there ethnic inequalities in psychosocial factors and quality of life among patients with coronary heart disease? To what extent are the inequalities influenced by socioeconomic status?

Ethnic inequalities were found among Roma and non-Roma patients with coronary heart disease: in psychological well-being (anxiety, depression), vital exhaustion and in health-related quality of life Roma patients scored worse compared to non-Roma. With regard to personality characteristics, ethnicity played a less significant role. A part of these differences could be explained by socioeconomic status of the participants –income level and educational grade.

### **Research question 4.**

In chapter 7 longitudinal data were analyzed in order to provide an answer to the following research question:

### Do psychosocial factors predict a change in health related quality of life among patients with coronary heart disease?

We found that psychological well-being and vital exhaustion were significant predictors of positive change in health related quality of life among patients with coronary heart disease. A change in the physical HRQL was predicted by baseline psychological well-being and baseline HRQL. A change in the mental HRQL was predicted by (baseline) psychological well-being, vital exhaustion and baseline HRQL. However, these factors were significant only among patients who improved in their health-related quality of life but not among those participants who remained stable or declined in their HRQL. Socioeconomic status and personality traits (Type D, hostility) were not identified as significant predictors of change in the health related quality of life among patients with coronary heart disease.

## **8.2. Discussion of the main findings**

One of the main findings of this thesis concerns the strong socioeconomic and ethnic inequalities in psychosocial factors, mainly psychological well-being and vital exhaustion, which are significant factors contributing to a worse prognosis and a lower quality of life among CHD patients. In the theoretical model proposed in the introduction of this thesis (Chapter 1) we assumed that one of the pathways by which SES influences CHD might be via a psychological mechanism. The results of the present thesis provide support for the validity of the first part of the relationships – SES inequalities in psychosocial factors among patients with CHD were found to be significant. Most of the psychological factors used in this thesis have already been shown in previous research (1,2,3) to have a significant impact on the CHD prognosis. The strong socioeconomic inequalities in these factors among CHD patients as shown in the present study support the assumption that socioeconomic disadvantage has a negative effect on later prognosis of disease among patients with coronary heart disease via psychological mechanisms, as proposed in the theoretical model in the introduction.

Additional support for this might be seen also in the fact that all mentioned associations between socioeconomic position and psychological factors of CHD were statistically significant even after controlling for the effect of functional status and/or severity of disease (indicated by the ejection fraction or type of the intervention indicated after the CAG). If the relationship between SES and psychosocial factors were to disappear after controlling for disease severity, it would be more likely that the association between SES and psychosocial factors is weak and influenced by other factors (in other words, patients with low SES have worse medical status from some other reason and their worse medical

status is the cause of their worse quality of life, higher depression and exhaustion). But our results show that the association between SES and psychosocial factors is both strong and valid. Moreover, the fact that we found SES inequalities in psychosocial factors among coronary patients has important implications itself, especially due to equity concerns. We know that SES inequalities exist in risk for CHD (4,5,6), but our results confirm that these inequalities persist also among people with developed disease, that is, patients with lower education and income were more depressed, anxious and exhausted.

Quality of life among CHD patients was also found to be significantly influenced by socioeconomic status, but only cross-sectionally (Chapter 4). Longitudinal analyses showed that depression and vital exhaustion, but not socioeconomic status, predict a positive change in the health-related quality of life (Chapter 7). However, it might be hypothesized that this relationship also fits with our proposed indirect psychosocial pathway, by which socioeconomic disadvantage influences a patient's quality of life. Income and education could affect quality of life also directly via worse SES, resulting in lower quality of life, but our results suggest that psychological factors (especially depression and vital exhaustion) are important mediators between SES and quality of life. This might not be surprising when considering the strong association between depression and CHD aetiology and prognosis: depression has been shown in numerous studies not only to increase the likelihood of CHD but also to have independent adverse effects on later prognosis among patients (7,8). Similar connections between vital exhaustion and CHD have been well established (9). The results of the present study show that similar to depression, vital exhaustion seems to play a significant role also in the association between SES and CHD outcomes.

Socioeconomic position was shown to be a highly significant factor explaining part of the difference in psychological outcomes and health-related quality of life between Roma and non-Roma. This strengthens the assumption that SES is one of the important ethnicity-related variables contributing to the differences in health between minority ethnic groups and the majority population, as indicated in the literature (10,11,12). However, despite the highly important role of socioeconomic position, we also found another effect of ethnicity on psychosocial factors which can not be explained by SES. As reported in the literature, there are factors such as living conditions and discrimination (13), language and cultural background (14), different anger and stress coping strategies (15) and differences in the use of the cardiological interventions (16) which might contribute to the relationship between ethnicity and CHD outcomes. This is likely to hold for psychological factors as well. The results of our study may also apply to other ethnic minority groups, but probably only among those with a significantly adverse societal position compared to the

majority population. For instance in the study by Kaul et al. (16) among black and white cardiac patients in the USA, similar ethnic differences in HRQL were found, but demographic variables explained fewer of these differences than in our study. However, this might be also due to the fact that education was used as an indicator of SES-while in our study income turned out to be most important factor.

It is of interest that SES and ethnicity have only a weak association with Type-D personality and hostility. It is probable that personality traits tend to be more stable and persistent than psychological well-being or vital exhaustion and thus could be less likely influenced by SES or ethnicity. Factors such as genetic predisposition or influences during development might be more important in the causal pathway in this case, as indicated in the literature (17, 18). However, it is probable that personality traits such as Type D mediate both adequate and inadequate coping behavior, thus creating via coping mechanisms higher emotional distress (depression, exhaustion) which have impacts on CHD prognosis.

Gender differences were not the main focus of the study. However, we controlled our analyses for this variable and gender was found to play an important role with regard to vital exhaustion: socioeconomic differences were more salient among men than among women with regard to this psychosocial factor. As we proposed in Chapter 5, the pathway mechanisms between socioeconomic status and psychosocial factors influencing CHD might be different among males and females. For instance, males seem to be more susceptible to a loss of status, and also differences in psychosocial distress perception and coping strategies are probable between men and women.

### **8.3. Strengths and limitations of the study**

One of the strengths of the present study is the fact that we were able to obtain a rather high response in a sample representative for Eastern Slovakia among such a difficult to reach group as Roma patients with coronary heart disease.

Another positive aspect of the study is that besides cross-sectional data, we also obtained longitudinal data, which allowed us to assess whether psychological factors and socioeconomic status predict a change in the quality of life among patients with coronary heart disease during their recovery process after an invasive coronary procedure (PTCA, CABG). Identifying factors which influence a positive or negative change in quality of life is of high relevance in the context of the increasing number of patients dealing with chronic conditions such as coronary heart disease, which pervasively influence their lives.

With regard to ethnic inequalities in coronary heart disease, the question often arises to which extent ethnic differences might be influenced

by the poor socioeconomic position of the minority ethnic groups. The design of the present study allowed us to distinguish ethnic vs. SES inequalities in quality of life and psychological factors among coronary patients due to our matching of Roma and non-Roma participants by socioeconomic status, and as a consequence to be able to contribute to this important, but somehow neglected area of research.

One of the aspects which might be perceived as both a strength and a limitation is the quite broad definition of psychosocial characteristics in this study. This allowed us to focus on a wide range of factors (including psychological well-being, anxiety, depression, vital exhaustion, hostility, Type-D personality, health related quality of life). However it also makes it more difficult to integrate and interpret the associations that we found between socioeconomic status/ethnicity, psychosocial factors and coronary heart disease. This clearly deserves additional study.

Due to the use of self-reported questionnaires for measuring of some of the variables, information bias may have occurred. However, several studies support the validity of self-reported indicators of health. They have been shown to be important predictors of mortality and morbidity data among patients with chronic disease, and particularly with the coronary heart disease (19,20,21,22).

As El Baz et al. conclude, in a large number of studies focusing in clinical pathways of diseases, controlling for the possible confounders is missing (23). We controlled for some demographic variables (age, gender), and the possible effect of objective health status on association was controlled in statistical analyses by adding in medical variables (i.e. disease severity, ejection fraction, functional status). We can not exclude that some confounding has remained though.

Moreover, our results might be biased by other factors, like access to treatment or diagnostic procedures, e.g. a selection bias might be present. We collected data among all patients coming for coronary angiography in the East Slovakian Institute for Cardiac and Vascular Diseases as scheduled by their local cardiologist, but we did not collect data among all patients from cardiology out-patient clinics. Thus, we were not able to record a possible selection bias by SES in the referral procedure from the local cardiologist by which patients are scheduled for coronary angiography CAG. However, we do not expect a significant selection bias in attending this medical center. Due to the system of health insurance coverage in Slovakia, SES inequalities in the access to the standard medical care (access to the hospitals and diagnostic/ treatment procedures) are still less pronounced. The fact that our sample came only from a population of patients with CHD indicated for coronary angiography implies that our results cannot be generalized to the whole population of coronary patients but only to the subsample referred for CAG. Also, other potential confounding factors might play a role in this context, including both

internal resources of the individual (coping mechanisms) and external factors (social support, family situation). The other important fact is that because of the backward social position of Roma, some of them may not have reached cardiology care and thus have died without reaching care, or may have reached the specialized cardiology treatment relatively late. Such a selection bias occurring would have led to the Roma being in a worse condition on average, which might have consequences for our findings – some of the differences between Roma and non-Roma could be accentuated not by the specific ethnic-related factors (or socioeconomic position), but by the worse medical status of Roma patients compared to non-Roma. However, we hope that we were able to partially prevent this bias by controlling for the effect of the disease severity in our analysis.

One possible limitation that also needs to be mentioned is the relatively small number of female patients with high socioeconomic position, which might have influenced our results in SES and gender differences regarding vital exhaustion. The small proportion of women with high SES compared to men is quite characteristic for the population of women in this age group in the Slovak population. Also the small size of Roma sample might account for a part of the results with regard to the effects of ethnicity on psychological outcomes and HRQL. However, the number of Roma patients in study (38 from 399 interviewed patients- 9.5%) is quite characteristic for the population in Slovakia.

## **8.4. Implications of our findings**

### **8.4.1. Implications for future research**

Our study has shown that psychosocial factors related to CHD (especially depression, vital exhaustion), and health related quality of life among patients with CHD differ by SES. However, there are still several questions which require further research efforts. We found that socioeconomic status was significantly associated with the health-related quality of life among coronary patients cross-sectionally but not longitudinally. A more comprehensive clarification of the associations between the key SES factors, psychosocial factors and CHD is therefore needed, based on longitudinal data, with special emphasis on how SE inequalities consequently influence the prognosis of CHD. This would provide more insight into the pathway mechanisms and possible mediating or moderating effects. Second, more studies are needed on the association with other important factors in the SES-CHD relationship, such as coping mechanisms and health-related risk behavior; this would provide a more comprehensive explanatory model.

Moreover, research should be focused not only on well-known risk factors such as depression, but also on some lesser known psychosocial factors such as Type D and vital exhaustion and their role in the relationship



between coronary heart disease and socioeconomic position. With regard to quality of life, as Swenson & Clinch (24) have pointed out, HRQL for the general population is not well known in all countries, including Slovakia. Thus, it is hard to decide to what extent quality of life among patients with coronary heart disease is different from the general population, showing the need for data on quality of life among community samples of non-patients.

With regard to ethnicity, it would be useful to include in future research factors such as living conditions, discrimination, access to the health care and lifestyle in order to clarify the mechanisms that may explain the additional effect of ethnicity on psychosocial outcomes (besides from socioeconomic status). Because of the specific cultural background of the Roma minority and the possible language and intellectual barriers, specific measurement methods and more qualitative oriented approach might add.

The present study is an example of a multidisciplinary-oriented research effort, as the key constructs (coronary heart disease, socioeconomic position/ethnicity, and psychological factors) represent different scientific fields. Including psychosocial factors in CHD research and treatment has quite a long tradition, but there is still some controversy in this approach. Frohlich (25) proposed that some of the problems are due to conceptual and methodological confusion between psychological and sociological theories when explaining, for instance, health-related behavior. However, it seems that it is needed to pay attention to both: psychological theories that help us understand some of the psychological reasons for an individual's behavior, and sociological theories which try to explain why certain groups of people tend to engage in certain health behaviors more than others (25). Integration of these two approaches could be useful in this case, and psychology might play a significant role in this context. But to achieve this, it would be necessary to pay far more attention to the topics related to mind-body interactions (the mechanisms of interaction among biological, behavioral, cognitive, sociocultural and environmental contributions to disease and health). Knowledge of "mind-body" interaction has largely accrued through multidisciplinary research in new fields such as psycho-neuro-endocrinology or behavioral medicine. Hence, greater attention must be paid to the mechanisms of mind-body interaction, and more attention to strengthening multidisciplinary research and care (26).

#### **8.4.2. Implications for public health interventions and patient care**

The fact that significant socioeconomic differences have been found in quality of life and psychological well being or exhaustion levels among patients who already have been diagnosed with coronary heart disease has important implications for public health practice. Socioeconomic position in particular should be taken into account when targeting

accordingly adapted intervention strategies aimed at enhancing a patient's quality of life. This also applies to psychosocially oriented intervention strategies among coronary patients. Such interventions have yielded quite inconsistent results regarding the improvement of medical indicators (such as the number of re-infarctions, revascularization), but they reported significant improvement in many aspects of quality of life among patients (27,28,29,30). Moreover, interventions aimed at risk behavior modification should be targeted at lower socioeconomic groups of the population and should take into account the higher incidence of risk psychological factors (depression, exhaustion) among patients with a lower socioeconomic position.

Another important implication from the present study is that ethnicity-specific factors among coronary patients should be taken into account. The adverse health-related quality of life, psychological well-being and vital exhaustion found among 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. Regarding this, Roma patients may warrant a personalized intervention (respecting their cultural background) when enhancing their quality of life.

The need for a socioeconomic perspective for research and practice in the field of cardiovascular disease is becoming more evident also with respect to the increasing costs for treatment within the system of medical care; cost-effective results should be integrated in interventions in this field in which an integrative approach, including psychological and socioeconomic factors, appears to be effective (31,32,33).

## **8.5. Conclusion**

The focus of this thesis was on a less explored field of the research: socioeconomic/ethnic inequalities in psychosocial factors and quality of life among patients diagnosed with coronary heart disease. Research in this field is generally lacking, especially in the countries of Central and Eastern Europe. Moreover, psychosocial predictors of quality of life in CHD are a somewhat overlooked topic, and even less is known about the issue of Roma coronary patients and their quality of life or mental state (34,35). The results of our study support the idea of the existence of significant SES and ethnic inequalities in psychosocial factors, in particular psychological well-being and vital exhaustion, which are significant factors contributing to a worse prognosis and lower quality of life among patients with coronary heart disease. Our findings also bring more insight into the predictors of health-related quality of life, as we found that socioeconomic position was associated with quality of life among CHD patients on cross-sectional level, but that longitudinally psychological variables (depression,

vital exhaustion) were more significant predictors of the patient's quality of life than socioeconomic status. We hope that this thesis will contribute to emphasizing the importance of an integrative approach to coronary heart disease, including both traditional biomedical risk factors, as well as psychosocial factors, which contribute to the prognosis of coronary heart disease.

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