Socioeconomic status and the course of quality of life in coronary heart disease and cancer
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Chapter 1

General introduction
Introduction

Both cancer and coronary heart disease (CHD) are prevalent chronic conditions which represent a major concern both for the patients’ life and for public health. In parallel with the development of new diagnostic methods and clinical treatments, research has recently begun to recognize the link between psychosocial factors and the development of these diseases. In particular, social epidemiology has produced a consistent set of findings suggesting that socioeconomic status (SES) is related to disparities in Quality of Life (QoL) during the course of chronic conditions such as cancer and CHD. However, to date there are no empirical studies which systematically explore this topic.

This introductory chapter starts with an overview of the research on cancer and CHD, addressing the impact of these conditions on QoL. Next, it describes the relationship between SES and QoL on a general level, as well as more specifically in cancer and CHD patients. Finally, it illustrates the psychological factors, such as perceived control, which might partially mediate this relationship. Furthermore, this chapter offers a description of the background and aims of the different studies which form the core part of this thesis.

Quality of life in cancer and coronary heart disease

Despite the fact that cancer and CHD remain the two leading causes of death in Western societies, the rate of mortality is slowly declining (Cooper et al., 2000; Jemal et al., 2008; Rosamond et al., 2008). Continuing advances in diagnostic procedures, surgical interventions and pharmacological treatments have contributed to prolong the life expectancy of patients, who are now increasingly confronted with the emerging problems related to the chronic nature of the illnesses. Consequently, the main focus of the research has shifted progressively from the mere exploration of the clinical outcomes of the disease towards a more comprehensive model focused on the QoL of the patients.
Cancer is a group of several diseases which result from a dysfunction in the DNA that causes excessively rapid cell growth and proliferation, sapping resources to the body. Although most types of cancer have a heritable basis, behavioural factors such as smoking or an unbalanced diet with high fat intake considerably augment the risk of developing the disease. Death rates from cancer have progressively decreased in the last two decades, mainly due to the promotion of screening campaigns and the improvement of treatments. Advances in the detection and cure of cancer have resulted in a rising number of survivors who face the disease and its consequences for an extended period. For these reasons, cancer is currently considered as a chronic condition by a large part of the scientific community.

CHD is a general term referring to a number of different illnesses affecting the heart. In this thesis, two specific forms of CHD were considered: acute myocardial infarction (AMI) and heart failure (HF). AMI is more commonly known as a heart attack, and occurs when the blood supply to part of the heart is interrupted. The resulting ischemia leads to an oxygen shortage which causes damage to heart tissues and their potential death. The risk of AMI is higher in those who are in late age, male, have a family history of CHD or experience premature menopause. However, behavioural or behaviourally modifiable factors such as smoking, excessive alcohol or drug consumption, hypertension, raised LDL cholesterol, obesity, physical inactivity and chronically high levels of stress have an even greater influence than genetic factors in determining the onset and progression of AMI. With a less acute onset but still characterised by a severe constellation of symptoms, HF is a progressive disorder underlying heart injuries often consequent to other diseases such as AMI, hypertension, congenital heart disease and rheumatic fever, or due to inappropriate responses of the body to heart impairment. HF is defined by inadequate contractions of the heart muscle, resulting in insufficient cardiac output, edema (pooling of fluid in lungs and body), shortness of breath, limitation in physical activity and fatigue. Because of its more
gradual onset, in the past HF often remained undiagnosed and was regarded as an aggravation of other types of CHD. Only relatively recently has HF been defined and diagnosed as a distinct clinical condition. Behavioural changes such as quitting smoking, adopting healthy eating habits and taking regular physical exercise are considered essential steps for an adequate cardiac rehabilitation in HF patients. Both cancer and CHD patients are exposed to a wide variety of psychosocial and physical problems. The initial period after diagnosis of cancer or CHD is regarded as a life-crisis moment, since the sudden and unexpected confrontation with a life-threatening disease forces the patient to face many distressing physical and psychosocial problems all at once. As a result, it is quite common that during the first phase of the disease the patient experiences high levels of depression, anxiety and psychological complaints associated with health and functional decrement (Alonzo & Reynolds, 1998; Ford, Lewis, & Fallowfield, 1995; Hosaka & Aoki, 1996; Profant & Dimsdale, 2000). In the first year after diagnosis, much of the impact of the disease may become less distressing, resulting in a general improvement in the psychosocial domains of QoL, while physical symptoms and somatic complaints tend to remain salient and even exacerbate with time (Brown et al., 1999; Kornblith, 1998; Van Jaarsveld, Sanderman, Miedema, Ranchor, & Kempen, 2001).

Beyond these general characteristics, the response, in terms of the domains of QoL which are mainly affected, often depends on the specific nature of the disease. For instance, QoL in cancer patients is strongly influenced by the location of the cancer and the treatment modality. Besides psychological morbidity, which is a common factor in all types of cancer (Ford et al., 1995; Neuhaus, Lanij, Ahr, & Bolte, 1994), restrictions in social life are mostly associated with disfiguring syndromes such as oropharynx carcinoma (Pourel et al., 2002), whereas long-term physical impairment is prevalent in debilitating diseases such as lung cancer (Kurtz, Kurtz, Stommel, Given, & Given, 1997). On the other hand, the occurrence of a CHD is clinically characterised by a limited supply of oxygen to the heart muscle and a
reduced blood flow in the cardiovascular system. If not promptly treated, CHD often results in acute and enduring physical consequences. For this reason, QoL in CHD patients is defined by a severe impairment in physical functioning, while negative outcomes on social and psychological domains remain significant but are less pronounced (Van Jaarsveld et al., 2001).

One of the purposes of the present thesis is to investigate disease-specific and generic characteristics of the cancer and CHD cohorts in relation to the course of QoL.

The description of the typical course of QoL in cancer and CHD patients is, however, too limited to give a complete picture of the phenomenon, since it overlooks the inter-individual differences determined by specific attributes of the patients. To gain a more extensive knowledge of the process of adjustment during the course of these diseases, it is indispensable to take into account some of the background characteristics of the patients which are known to impact on health outcomes, such as their SES.

**Socioeconomic status and quality of life**

In modern societies, SES refers to the hierarchical distinctions between individuals or groups which can alternately be based on personal lifestyle or social prestige, like the educational level attained, the professional achievements or the personal and family income (Grusky, 1994). In Western societies, SES is largely determined by three indices: education, job position and income. These indices are generally interrelated and consequent. Children belonging to wealthy or high-educated families tend to have access to a wide range of material and social resources which further promote and support their education. As a result, access to a developed social network, in combination with their educational attainment, facilitates them in the attempt to reach more satisfactory and better-paid positions. Furthermore,
people living in high socioeconomic environments enjoy more benefits in terms of availability of goods and services, community norms and values. Some of the indices of SES, such as educational level, are constant and can only improve with time. Others, like incomes and job position, can move upward or downward through a process called social mobility, which is partially influenced by events that are not under personal control, like winning the lottery or losing one's job due to the company's bankruptcy. The salience of these socioeconomic indices may vary across socio-cultural contexts. In the Netherlands, educational level is considered to be an appropriate indicator of SES, whereas in other countries such as the United Kingdom occupational prestige is more frequently used (Marmot et al., 1991).

In the different studies presented in this thesis, SES was alternately represented by using educational level (Chapters 2 and 4) or a composite index of educational level, income and job prestige (Chapters 3 and 5). Educational level was preferred over other indices of SES, because it reflects more stably the individual situation of the subject (Mirowsky & Ross, 1998; Ross & Mirowsky, 1999; Winkleby, Jatulis, Frank, & Fortmann, 1992), is strongly related to personal psychosocial resources (Ranchor & Sanderman, 2000), substantially affects QoL (Ross & VanWilligen, 1997) and is especially influential on the course of the disease (Ranchor & Sanderman, 1991).

Socioeconomic status and quality of life in cancer and coronary heart disease

Because of the different distribution of resources between socioeconomic groups is not surprising that socioeconomic stratification has a powerful influence on health (Adler et al., 1994; Lynch & Kaplan, 2000). Individuals with low SES are worse off in general health, more likely to develop chronic disease and report higher rates of mortality consequent to clinical conditions compared with their high SES counterparts (Adler, Boyce, Chesney, Folkman, & Syme, 1993; Huisman, Kunst, & Mackenbach, 2003; Macintyre, 1997).
For cancer patients there are several lines of evidence showing socioeconomic disparities in relation to screening attendance, incidence, mortality or medical outcomes, with better outcomes reported for individuals with high SES (Harvei & Kravdal, 1997; Konski, Berkey, Ang, & Fu, 2003; Mackenbach et al., 2004; Vanloon, Burg, Goldbohm, & Vandenbrandt, 1995; Wardle, McCaffery, Nadel, & Atkin, 2004), and yet there is an astonishing paucity of research assessing the QoL of patients with various types of cancer in relation to their SES. Recently, a study on prostate cancer showed that low-educated men experienced worse outcomes in most domains of QoL six months after treatment and less recovery of QoL over two years after diagnosis, compared to high-educated men (Knight et al., 2007). This study offers the first indications of a relationship between SES and QoL in cancer, but research has still a long way to go to provide definitive conclusions.

As with cancer, previous research on CHD and SES has focused principally on incidence and mortality, showing a higher risk of developing a CHD and lower subsequent survival in low socioeconomic groups. QoL in CHD patients with low SES is linked to an unfavourable course in several health outcomes (e.g. perceived general health, long-term disability, physical functioning, mobility decline, social isolation, mental health) (Koster et al., 2004; Sacker, Head, & Bartley, 2008; van der Meer & Mackenbach, 1998). Moreover, socioeconomic inequalities are more pronounced in patients’ functional status, which seems logical considering the strong impact of CHD at the somatic level (Clarke, Frasure-Smith, Lesperance, & Bourassa, 2000; Ickovics, Viscoli, & Horwitz, 1997).

Besides the literature presented above, there is in general little evidence on the impact of SES on the course of QoL in cancer and CHD patients. To address this lack of knowledge, three of the studies in this thesis investigate this issue in depth.

The first study (Chapter 2) explores the role of SES (measured as educational level) in the course of cancer by examining the relationship between SES and psychological, physical and social aspects of QoL over time. The sample for this
research originates from the Groningen Longitudinal Aging Study (GLAS), a Dutch population-based prospective database which includes a pre-morbid measurement of the participants. Due to the prospective design of the research it was possible to assess the actual process of adaptation to the disease, which was defined as the patients’ capability to return to their original levels of QoL. The second study (Chapter 3) employs a sample of CHD patients, also derived from the GLAS database. In this research, longitudinal changes in QoL were followed from the pre-morbid assessment until one year after diagnosis, by comparing the course of adaptation in two groups of CHD patients with low and high SES. The study assesses whether cross-sectional inequalities at different assessments were consistent with the longitudinal results. Importantly, pre-morbid measurements were used to determine whether post-diagnosis socioeconomic differences in QoL were caused by a differential response to the disease or were related to the pre-morbid situation.

The third study (Chapter 4) aims to give more insight into the cross-sectional and longitudinal socioeconomic differences in QoL in HF. In this study a large sample of Dutch HF patients was analysed, using data from the Coordinating study evaluating Outcomes of Advising and Counselling in Heart failure (COACH). Information on patients’ QoL was gathered through five assessments from their hospitalisation up until 18 months after their discharge. Educational level was used as an index of SES. It is important to see whether SES determines differences in QoL after discharge, because patients with HF have significant impairment in all domains of QoL compared both to the general population and to patients with other chronic conditions (Hobbs et al., 2002; Van Jaarsveld et al., 2001). In particular, low-educated HF patients report more than a 50% increase in the risk of hospitalization, which is generally associated with poor QoL outcomes (Sui, Gheorghiade, Zannad, Young, & Ahmed, 2007). In this study we investigated which domains of QoL showed greater socioeconomic differences at different
assessment points. Furthermore, we considered whether HF patients differentially improved their QoL after discharge in accordance with their SES.

The relationship between socioeconomic status, psychological resources and quality of life
As mentioned before, disparities in health may be related to a different distribution of environmental and personal resources between socioeconomic strata. Low socioeconomic groups have less access to services aimed at promoting wellbeing, education and social cohesion which endorse positive interactions between the members of the community. As a result, persons living in lower socioeconomic environments are more exposed to uncontrollable situations or conflicting relationships, reporting reduced levels of social support and perceived control and at the same time increased levels of neuroticism and hostility. According to the reserve capacity model developed by Gallo and Matthews (2003), such prolonged exposure to stress limits the opportunities to develop new psychosocial resources and leads to a gradual depletion of the resource reserves. Subsequently, individuals with low SES tend to consume during their life the limited amount of resources they have available, thereby becoming increasingly vulnerable when exposed to new stressors (Gallo & Matthews, 2003; Gallo, Bogart, Vranceanu, & Matthews, 2005).

Psychosocial resources have a strong impact on health outcomes both directly, through the regulation of the neuroendocrine response to stress (Seeman & McEwen, 1996; Sieber et al., 1992), and indirectly, by promoting healthy behaviours (Lox & Freehill, 1999; Meland, Maeland, & Laerum, 1999; Pham, Taylor, & Seeman, 2001; Krause, 1991). Furthermore, there is evidence that such resources moderate the relationship between SES and health outcomes (Ranchor & Sanderman, 1991; Ranchor, Bouma, & Sanderman, 1996; Sieber et al., 1992; Taylor & Seeman, 1999). In particular, a low level of perceived control is strongly linked to high risk of CHD.
(Bosma et al., 1997; Bosma, Stansfeld, & Marmot, 1998) and to an impaired functional status after developing the disease (Seeman & Lewis, 1995). However, it is unclear whether perceived control underlies the impact of SES on functional trajectories after CHD (Taylor & Seeman, 1999).

To shed more light on this issue, the fourth study in this thesis (Chapter 5) explores prospectively changes in functional status in CHD patients, in an attempt to determine whether eventual disparities in different domains of functional status might be explained by specific aspects of perceived control. The sample for this study was again derived from the GLAS database; data on patients’ functional status were collected before the disease and one year after diagnosis.

Summary

The first part of this thesis (Chapters 2, 3 and 4) provides insights into the impact of SES on cancer and CHD by exploring cross-sectional and longitudinal differences in patients’ QoL and by suggesting possible mechanisms which might regulate such disparities. The second part of the thesis (Chapter 5) offers a potential explanation for the relationship between SES and disparities in QoL by addressing the mediating role of specific psychological characteristics such as perceived control. The methodological strengths of all four studies are the longitudinal and prospective designs and the multiple assessment of the patients.

The final chapter (Chapter 6) presents a summary and discussion of the main results and implications of these findings. This is followed by a general summary of the thesis.
Reference List


Cooper, R., Cutler, J., svigne-Nickens, P., Fortmann, S. P., Friedman, L., Havlik, R. et al. (2000). Trends and disparities in coronary heart disease, stroke, and other


Part 1

Socioeconomic status and the course of quality of life in cancer and coronary hearth disease

This section contains three original research articles. It includes two separate articles on the relation between socioeconomic status and the course of quality of life in cancer and coronary heart disease, which have been accepted for publication in peer-reviewed journals. The third article investigates cross-sectional and longitudinal socioeconomic differences in quality of life in heart failure patients.