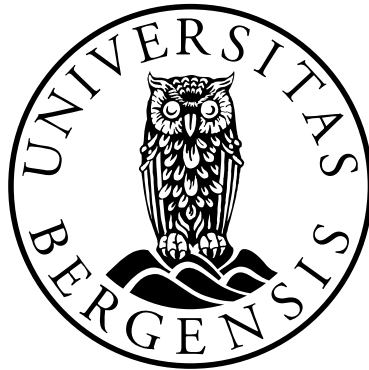


Health, coping and independent living in community-residing older care recipients

Hans Inge Sævareid



Dissertation for the degree philosophiae doctor (PhD)
at the University of Bergen

2013

Dissertation date: May 30. 2013

Scientific environment

This thesis was founded upon the project “Coping resources and coping capacity in community-residing care recipients, aged 75 years or more”, undertaken by the Section of Geriatric medicine, Faculty of Medicine and Dentistry, University of Bergen.

The project was partly financed by EXTRA funds from the Norwegian Foundation for Health and Rehabilitation/Norwegian Health Association and by the European Union under the 5th Framework Programme (Care for the Aged at Risk of Marginalization [CARMA], key action six: “The ageing population and disabilities”)



Acknowledgements

This project was initiated by me in 1998. It has been a long road, and also involving numerous people. Now I want to express my gratitude.

First of all I want to thank my main supervisor, Professor Harald A Nygaard. He was engaged in the project from the planning period, and has contributed with considerable insight and advice throughout the work. I feel privileged of having experienced this collaboration; few persons in our country have more knowledge about the life situation of care dependent older people.

My co-supervisor, Professor Toril Christine Lindstrøm, has followed my academic career from the very beginning, first as a teacher at Section of Nursing Science, and later as my main supervisor at my master's thesis, always with "clear messages" and a "red pen" giving concise advice for improving academic thinking and writing.

I would also like to thank Professor Torbjørn Moum for assistance and training in statistical analyses, and Professor Anders Bærheim for being my co-supervisor during the last period of the work.

Initially, my project was connected to the Section of Nursing Science, and later to the Section for Geriatric Medicine at the Department of Public Health and Primary Health Care at the University of Bergen. I want to say thank you to all the colleagues that were involved and contributed with inspiring ideas and assistance to the project. Also for the practical advices and assistance I have received from Eldbjørg Sanden Søvik.

Throughout this period I have been employed at the University of Agder. I am grateful for kind facilitation of the work situation, and for a good and academically stimulating academic environment.

Many colleagues have contributed with a large amount of work in the project, both with data collection, in cooperation with the CARMA project and in publications. Elsebeth Krøger, Magnhild Høie, Marthe Fensli, Arild Nilsen and Arne Leland

contributed with assistance on the data collection, the latter four also writing their master thesis on the data from this project. Marthe, together with Ragnhild Skaar and Jørn Stordalen contributed a lot to my participation in the CARMA-project.

An important goal for me was to exploit the extensive amount of data from the project as much as possible. Besides my supervisors, Knut Engedal and Elin Thygesen contributed to the articles included in this thesis, and I want to thank Bjørg Dale and Elin Thygesen for using the data from the project to write their doctoral thesis.

Several unit nursing officers in the various municipalities contributed with significant effort during the period of sampling the respondents and the data collection. Their enthusiasm and goodwill impressed me. Special thanks go to all the respondents that consented to participation. We were privileged to be able to visit them in their own homes, always feeling welcomed, and always learning from their life stories.

I have received funding from “Nasjonalforeningen for Folkehelsen / EKSTRA-midler fra Helse og Rehabilitering”, from the European Union under the 5th Framework Programme, and from the Hanche Olsen Stiftelsen. Both the University of Bergen and the University of Ager has provided funding to the project. All for which I am grateful.

Writing requires calmness and concentration. My friends, Karen Junker and Torstein Gundersen, have kindly given me the opportunity to use the cottage in Mandal. I could not have a better space available. Thank you very much.

My wife Gunhild has supported me throughout the project and generously giving me time and motivation for working with the project. So have my children, Trygve Johannes, Margrete, Karoline and Anna Sofie, and my children in law, Karen Marie and Joel.

In memory of my parents, Marit and John.

Abstract

Background: Community health care is the arena in which most care-dependent older people receive professional nursing assistance. The main objective of home nursing care is to improve the patient's quality of life and/or to maintain his/her independence.

Aims: To describe the characteristics of people receiving home nursing care (HNC), and how the recipients define their health. To examine the mechanisms underlying the loss of independent living and the allocation of home nursing care, and whether home nurses give priority to the overall goals of HNC.

Respondents/methods: 242 respondents were aged 75 years or older, receiving HNC. A survey with baseline- and follow-up data (a 2-year period) was undertaken.

Results: The oldest patients were the healthiest. Subjectively perceived health was more important in the perception of health than objective health measures. Strong perception of social support and a high self-rating of health predicted a longer period of independent living. Functional and cognitive decline and being male were the most important predictors of loss of independent living. Compensatory or complementary assistance from informal networks did not influence the period of independent living. Coping resources, measured as Sense of Coherence (SOC), did not prolong independent living. The allocation of home nursing care was mainly influenced by impaired functional health, and not influenced by subjective health measures.

Conclusion: Older persons with a poor perception of subjective social and health conditions are vulnerable since these are not intercepted as a reason for care assistance.

Implications: Nurses should emphasize the identification and treatment of subjective health problems. The salutogenic approach should be given stronger attention as a principle for nursing practice. More research should be done with regard to how the dimensions of sense of coherence influence health promotion. This includes both the individual patient, and how services are organized

List of publications

Paper I

Sævareid, H.I.; Thygesen, E.; Nygaard, H.A.; Lindstrøm, T.C. (2007). Does Sense of Coherence affect the relationship between self-rated health and health status in a sample of community dwelling frail elderly? *Aging & Mental Health*, 11(6), 658 - 667.

Paper II

Thygesen, E.; Sævareid, H.I.; Lindstrøm, T.C.; Engedal, K.; Nygaard, H.A.: (2009). Predicting needs for nursing home admission – does sense of coherence delay nursing home admission in care dependent older people? A longitudinal study. *International Journal of Older People Nursing*, 4(1), 12-21.

Paper III

Sævareid, H.I., Thygesen, E., Lindstrøm, T.C. Nygaard, H.A.: (2012). Association between self-reported care needs and the allocation of care in Norwegian home nursing care recipients. *International Journal of Older People Nursing*, 7(1), 20 – 28.

List of abbreviations

ADL	Activities of daily living
CDR	Clinical Dementia Rating Scale
GHQ	General Health Questionnaire
GRR	General resistance resource
HNC	Home nursing care
NHA	Nursing home admission
PASW	Predictive Analytics Software
RI	Reported illness
SD	Standard deviation
SHC	Subjective health complaints
SHCI	Subjective Health Complaints Inventory
SOC	Sense of coherence
SOCQ	Sense of Coherence Questionnaire (also called the Orientation to Life Questionnaire)
SPS	Social Provisions Scale (<i>The Revised Social Provisions Scale</i>)
SPSS	Statistical Package for the Social Sciences
SRH	Self-rated health
WHO	World Health Organization

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1.0 Introduction

Living at home late in life requires the ability to perform particular physical, mental, and social tasks, including the basic activities of daily living (ADL; physical conditions) and dealing with emotional challenges. These capacities may be reduced during the ageing process and by concomitant diseases, increasing risk of dependence or eventual institutionalization (1, 2).

Community health care is the arena in which most care-dependent older people receive professional nursing assistance. Together with home help, a service provided to compensate for any deficits in the ability to perform domestic work, the main objective of home nursing care is to improve the patient's quality of life and/or to maintain his/her independence (3). In this thesis, "independent living" is defined as the ability to live in one's own home or in sheltered housing, despite physical shortcomings, physical or mental illness, or disability, with compensatory and caring assistance provided by community carers.

As the former head of a home nursing unit in a Norwegian community, I have experienced the diversity of challenges that professional care staff encounter. First and foremost, I am aware of the complexity of the life situations of older people with chronic disabilities, illnesses, and impairment, and the interplay between their housing situations and social networks. A thorough examination of the physical, mental, and functional health of these elderly individuals, together with an assessment of their social networks, is essential for the implementation of satisfactory care. A second challenge for any nursing unit is the public demand for efficient use of economic resources. I often found that these two challenges were in conflict.

I also observed that most patients preferred to remain in their own homes, even when their health was deteriorating and their need for care increasing. Therefore, during my daily work, there was a strong emphasis on finding solutions that encouraged and

assisted individuals to continue living independently in their own homes. In most cases, these actions had the intended effect, particularly if the care recipient felt safe and secure with regard to his/her health and social situation.

However, even individuals who, according to their health status, were best equipped to manage independent lives at home sometimes failed to do so. Conversely, some care recipients in poor health seemed to manage against all odds.

Noting these discrepancies, I started to look for explanations. This led me to theoretical considerations, and I found that theories about empowerment and coping were useful in developing a more comprehensive understanding of these issues.

Empowerment aims to strengthen competence and self-participation, to achieve vital goals (3). This is an important departure from the traditional principles of medicine and nursing, in which diagnosis and meeting the patient's needs are the dominant approaches to treatment. The concept of empowerment underlies the development of coping theories, such as the theory of "sense of coherence" proposed by Aaron Antonovsky (4). Antonovsky's salutogenic way of thinking, which focuses on the factors that generate health, became my new approach to understanding the health situation of older home-living care recipients. According to Antonovsky (4), a strong capacity to cope implies a strong ability to mobilize and use resistance resources, which allow an individual to cope with both everyday tasks and crises.

Based on these principles and my professional experience, I became interested in the following questions: *Why do some people master everyday problems better than others?* and *Does coping ability explain the observed differences?*

Norwegian plans for the long-term care of older people focus on deinstitutionalization, entailing a strong focus on domiciliary care services (5, 6). This requires accurate knowledge of home-living care recipients.

1.1 Aims of the study

The aims of this study were to increase the body of knowledge about older home-living care recipients receiving home nursing care (HNC), particularly the coping resources that facilitate their independent living, and to investigate whether HNC supplements or provides these resources.

Therefore, an aim of the analyses presented in this thesis was to describe the characteristics of a patient sample with particular regard to their coping resources, socio-demographic variables, health, and social conditions.

2.0 Theoretical framework and main concepts

2.1 Health

Health is a complex phenomenon, comprising a variety of dimensions. The most common way to examine the concept of health has been to distinguish between objective and subjective health. In recent decades, this has led to the development of two major unifying theoretical concepts: the biostatistical theory (7) and the holistic or humanistic health theory (8). The biostatistical health theory regards health as the normal (meaning “statistically normal”) functioning of biological activities. This includes the health of the organs, tissues, and mental faculties, and implies that they function properly to maintain and renew life (7).

This theory defines the absence of biostatistical health as disease, a perspective that has been criticized in recent decades, particularly because individuals may experience some kind of health despite biological disease. Consequently, health can be considered more than the absence of disease (9). In humanistic health terminology, the concept of “illness” is commonly used instead of “disease”, indicating that malfunctioning may have a subjectively perceived dimension of “not being well”. Consequently, a person may experience illness without having a disease, or may have a disease without feeling ill.

The health approach used in this thesis is based on the *salutogenic* orientation to health defined by Antonovsky. The concept of salutogenesis (4, 10) was developed as a new and alternative way of understanding health and disease, in contrast to the traditional pathogenic perception of how disease develops. Using a salutogenic way of thinking, Antonovsky (1923-1994), an Israeli-American medical sociologist, shifted the focus of attention from the factors that create disease and malfunction (pathogenesis) to the factors that create health and successful functioning.

Antonovsky's salutogenic approach is one of the fundamental theories underpinning the Ottawa Charter for Health Promotion, which states that "health is ... seen as a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources as well as physical capacities" (11) (p.1). According to this definition, the concept of health includes physical and psychological conditions and social and spiritual dimensions. This definition also considers health to be a dynamic entity.

Antonovsky developed his theory of health by raising questions about the factors that create health and about the origins of health. He urged social workers and health personnel to ask themselves "new" questions, such as: *How do people stay healthy?* and *How do people cope with everyday challenges?*

He also wanted to correct the common misconception that health is the diametric opposite of disease, maintaining that we should abandon our one-dimensional preoccupation with pathogenesis, in which the cause of a disease is paramount (4, 10). Antonovsky's theory states that health involves movement along a continuum between ill health ("dis-ease") and (total) health ("ease"). It is important to emphasize that Antonovsky did not reject the importance of understanding the pathological development of disease. However, he wanted to draw attention to human resources and their capacity to create health, to replace the one-sided focus on risks and diseases (4, 12). Therefore, when caring for people, a carer's attention should be directed more towards health-promoting factors than towards risk factors.

2.2 Coping

2.2.1 The concept of "Sense of Coherence"

A salutogenic perspective presupposes two factors: an orientation towards problem-solving and a capacity to find and use resources that are appropriate to this problem-solving (4, 12). These personal skills are the foundation of the concept of "sense of coherence", which is the key to understanding coping.

Sense of coherence (SOC) is a global orientation, expressing the extent to which one has a pervasive, enduring, and dynamic feeling of confidence that: (a) the stimuli deriving from one's internal and external environments during life are structured, predictable, and explicable (comprehensibility); (b) resources are available to meet the demands posed by these stimuli (manageability); and (c) these demands are challenges worthy of investment and engagement (meaningfulness) (4).

Because a strong capacity for problem-solving is important for health and well-being, it is imperative to focus on the mechanisms that strengthen SOC. Antonovsky considered *life challenges* to be both sources of risk (creating disease) and resistance resources (creating coping capacity). Therefore, he stated that the concept of SOC is a key to understanding how people mobilize their coping resources; he also identified *general resistance resources* (GRRs) and *appropriate challenges* as necessary concepts for understanding the mechanisms of coping. Antonovsky hypothesized that a strong SOC is associated with a person's ability to mobilize, co-ordinate, and utilize the GRRs required to cope with any specific situation.

2.2.2 General resistance resources

GRRs are internal or external to the individual, and may be used or activated in response to a perceived need to cope with and/or oppose factors that threaten health or well-being. These GRRs may include material resources, knowledge, intelligence, ego identity, coping strategies, cultural stability, health-care systems, religion, preventative health orientations, and positive self-assessed health. These resources can be used in different situations and in various combinations (see Figure 1).

GRRs provide people with life experiences, through which a person tends to develop an orientation towards the world (outlook on life) and thus an overall SOC. Through these experiences, the level of SOC is developed. This SOC will remain a personal orientation to the challenges an individual faces throughout his/her life, and will therefore influence the extent to which that individual exploits his/her GRRs. Thus,

the relationship between GRRs and SOC is a feedback loop. Although SOC is believed to be quite fixed by about 30 years of age, this interplay means that a person's coping abilities will be modulated throughout his/her life, for instance, when that person is affected by disease. Four spheres in human life are vital in garnering these resources: inner feelings, immediate personal relationships, major activities, and external issues (4). Accordingly, the "view of life" (religious or ideological), the perception of social support, the degree of mental stability, and the option to participate in everyday activities are important (13). This implies that a person with a high level of SOC is more likely to remain healthy, with a high level of personal balance, despite stressful life events, disease, or threats from the environment. He/she will have or seek resources to master any situation, whereas individuals with low levels of SOC will face external demands with persistent feelings of unease (4). According to Antonovsky, a person facing overwhelming challenges tends to perceive the situation as stressful, with a high risk of experiencing "dis-ease". This situation occurs when the resources available, or felt worthy of investment, are insufficient. Therefore, the greater the load, the more important is the role of salutary factors (4).

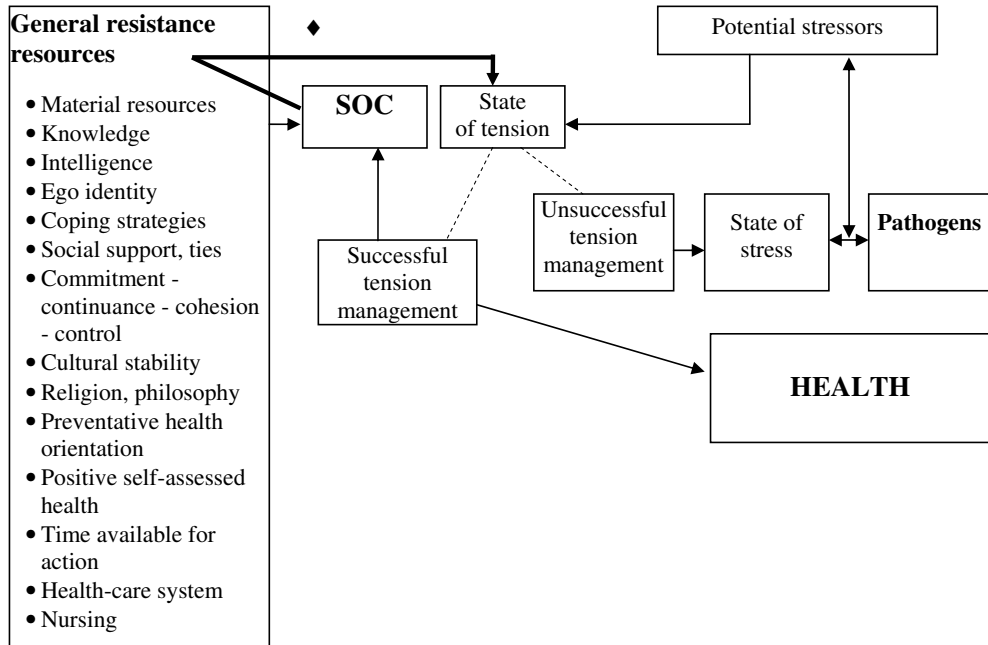


Figure 1. The salutogenic model of coping (from Hollnagel & Malterud (14) p.425).
 (◆ indicates that a strong SOC mobilizes the GRRs at one's disposal.)

2.2.3 Measuring coping

The concept of SOC is measured with the SOC Questionnaire (SOCQ), also called the "Orientation to Life Questionnaire" (4), a self-rating questionnaire that measures the extent to which an individual is likely to judge a stressor as comprehensible, manageable, and meaningful. It appraises whether the subject believes him/herself able to manage and overcome such stress. The SOCQ has been widely adopted as an instrument for measuring coping capacity in health and well-being research, somatic and mental health research, quality of life research, and psychosomatic medicine (15, 16). Therefore, the SOCQ was considered suitable for the purposes of the present study.

It is already well established that socio-demographic factors, such as age, sex, marital status, and education level, contribute to health in various ways (17, 18), and therefore to an individual's capacity for independent living.

Antonovsky's theory represents one perspective on and a way to investigate the relationships between personal resources and health. SOC has been shown to predict perceived good health in men and women (19). Because both socio-demographic variables and SOC can predict health, we expect them to co-vary in consistent ways. Relatively few studies have analysed these relationships solely in older people.

2.3 Social resources

2.3.1 Social networks

Social networks have three characteristics: (a) they are arenas for psychological and social adaptation; (b) they are venues for the exchange of services and material resources; and (c) they are "power plants" that can offer help in situations in which an individual cannot manage alone. Therefore, social networking is important as both a source of personal growth and development and a source of help in various life situations (20).

2.3.2 Social support

Robert S. Weiss (21) defined "social support" as an interactional process, in the sense that social support is achieved through various forms of mutual interactions between people. A perception of social support also results from interactions between personality factors and situational factors, in the sense that these give a person a feeling of well-being, or of loneliness in the perceived absence of social support. Also implicit in this theory is the assumption that each person requires social relationships, and that only the experience of social support can prevent various forms of loneliness (21).

Weiss identified six forms of social support that can occur through interactions with other people. Each of the various forms of social support is the result of different

forms of social contact. He identified two forms of loneliness, “emotional loneliness” and “social isolation”, as unsatisfactory experiences of social contact. These two kinds of loneliness result from a lack of close, intimate relationships and a lack of an accessible, meaningful circle of friends, respectively (21).

Dissatisfaction with social contacts is closely related to the feeling of loneliness (22). A lack of social support may result in an experience of loneliness, which can be defined as unfulfilled intimate and social needs (23). A definition reflecting the multidimensional aspect of loneliness was suggested by Luanaigh and Lawlor (24), with clear relevance to clinical work: loneliness is a “bio-psycho-social” phenomenon, reflecting a biological disposition (inherited personality traits), which can be caused by psychological precipitants (depression, grief) and social isolation.

In the Umeå 85+ project, older people described loneliness in two dimensions. On one side, they experienced the limitations of loneliness, i.e., living with loss and feeling abandoned, whereas on the other side, they experienced the opportunities presented by loneliness, i.e., living with confidence and feeling free (25). Feeling abandoned was experienced as a sense of having been set aside and feeling invisible, especially with the death of those close to them. No one cared, and why should they? Feeling invisible was a sense that they were not being seen for who they were; the “real me” was invisible, and their skills and experiences were neglected and not recognized for own skills (25).

2.3.3 Measuring social support

Weiss’s theory of social support and his operationalization of the interpersonal relationships that contribute to social support led to the development of the instrument called the Social Provisions Scale (SPS) (26). Based on the recommendations of Mancini and Blieszner and Anderson and Stevens (27, 28), four of the SPS subscales were selected for this investigation: attachment, social integration, opportunity for nurture, and reassurance of worth.

A strong correlation between loneliness and age has been shown, affected by factors such as sex, health and functioning (29), and loss of an attachment figure (24). In general, women tend to report loneliness more often than men, and unmarried people more than married people, which suggests that marriage protects against loneliness (24). Widowhood and the loss of friends are clearly determinants of loneliness, particularly among women, who often outlive their spouses, for whom they had acted as carers. Consequently, widowhood can also sometimes seem to be a release from many caregiver burdens (30, 31). Socio-demographic variables, such as little education and low socio-economic status, are also associated with increased feelings of loneliness (32).

A vast body of research has confirmed the associations between loneliness and various objective and subjective health conditions (24, 33, 34). Loneliness has been shown to be a risk factor for depression and anxiety, and has a negative impact on physical health, including on blood pressure, sleep, stress-induced immune responses, and cognition (24), and it increases cardiovascular health risks (34). Therefore, increases in both morbidity and mortality (29) have been observed with loneliness, as well as poorer mental health and cognitive functioning, and dementia (34-36). Accordingly, it has also been demonstrated that loneliness has a negative effect on self-rated health (SRH) (30).

Given its negative impact on health, loneliness increases the need for care assistance (37) and the risk of nursing home admission (NHA) (29, 38).

2.4 Care for the elderly in Norway

Home nursing care in Norway is founded upon the principle of the individual allocation of care, based on patient needs that can be physical, mental, social, or spiritual (5, 39, 40). The primary objectives are that everyone should be enabled to live in their own home for as long as they wish, and that health and quality of life are areas in which the municipal health service is obliged to offer help. This implies that these services should be based on individually planned care, placing great importance

on the patient's individual needs. Key terms are "tailor-made care" and "individualized arrangements". Conformity, standardization, "stop-watch care", and "package deals" should be avoided as principles underlying care arrangements (41).

These aims for public care, which are ambitious and often difficult to achieve, indicate that HNC offers services within a variety of aspects of human life. Therefore, increased knowledge is required about the relationships between HNC services and the recipients of this assistance.

In Norway, any person in need of nursing care is entitled to receive free HNC. The service is offered as day and night care and aims to help people to continue living in their own homes. Of 354,000 people aged 75 years and over, 19.7% received HNC in 2005, whereas 10.2% were cared for in long-term care facilities (42). However, importantly, the amount of allocated care is restricted by both a shortage of personnel and limited economic resources (43, 44).

In 1998, the Action Plan for Older People (45) was created in response to the rapid increase in the number of older individuals with nursing and care needs. Municipal health and social services were strengthened to meet demographic developments and the future growth of care needs. In recent years, Norway has seen considerable modernization and growth in the capacities of nursing homes and sheltered accommodation.

2.5 Research problems addressed in this study

2.5.1 Self-rated health and coping in older persons receiving home nursing care (paper I)

An individual's current health status is an important indicator of both his/her short-term prospective health status and his/her need for health care in the more distant future. Because SRH has strong predictive power, it is important to understand this

concept and its components. Assessing SRH involves both subjective assumptions and actual knowledge of one's own health status (46-48).

A patient's judgement of his/her own health seems to be based on biomedical (disease symptoms), functional, and emotional components (49-51). This raises the question of whether coping resources are also included in a patient's assessment of SRH. According to the theory of Antonovsky (4), health is affected by an individual's coping resources, or SOC.

Studies that have investigated the associations and effects of coping resources on SRH with both cross-sectional and prospective study designs have found a strong relationship between a high level of SOC and good perceived health (52-55). Of particular interest is Suominen et al.'s (55) four-year follow-up study of 1976 individuals, in which an initial strong SOC predicted a good subjective state of health in both women and men.

One objective of the present study was to examine the associations between SRH and physical, functional, social, and mental health measures in community-dwelling elderly individuals needing nursing care. Of special interest was how coping resources (SOC) influence these relationships. Based on the literature reviewed in this paper, we anticipated that SRH would be associated with both health-related variables and SOC (12, 56), and that women and men would consider different aspects of their health and coping resources when judging their own health (57, 58).

2.5.2 Allocation of nursing care (paper II)

The main objective of home care is to improve the quality of life of patients and/or to maintain their independence (3). The provision of home care is no longer based on availability, but rather on the assessment of the care recipient's needs. This has resulted in an emphasis on "tailor-made care", implying a strong balance between the individual care needs of the recipient and the actual amount of care allocated (59).

Few studies have addressed factors that influence the amount of services allocated (59). Comorbidities and problems with performing ADL are major predictors of HNC allocation (60-62). The influence of social support on the allocation of home care services is more complex and appears to vary depending on the type of support evaluated (63-65). Finally, findings regarding the impact of cognitive impairment and mental disorders on the use of HNC are mixed (66).

Obviously, an older person's needs are important predictors of HNC. In recent decades, our increasing interest in the capacity for self-care has caused us to direct greater attention to the coping resources of care recipients. However, few data are available on how coping factors correlate with the allocation of HNC. Because a capacity to cope seems to influence the lives of ill and impaired older people by moderating their stress, coping is expected to influence their self-care capacity and thus their need for home care services.

An investigation conducted in 2010 by FAFO (Fafo Institute for Labour and Social Research) (44) concluded that public services for the elderly have decreased over the past 20 years. The report was based on an analysis of public statistical data and a survey of 4187 nurses. During the past 20 years, the pressures on the care-dependent elderly have increased. The number of institutional places per 1000 people in the population over 80 years of age dropped from 279 in 1989 to 188 in 2006. The proportion of residents over 80 years of age who received home care fell from 41% in 1992 to 37% in 2006. Nurses employed by municipal health services reported feeling that those with the most comprehensive care needs experienced the greatest deficit in the care offered. More than 50% of the nurses stated that, in particular, patients' needs for security, visits, and meaningful activities were unmet, whereas about 65% said that the needs of the elderly for nutrition and bodily care were met well. Only 22% of nurses said that they had time to undertake preventative care measures for the elderly (44). In the period 2000-2006, the proportion of elderly people who only received various forms of practical assistance (home help) declined by 36% (67).

Two objectives of this study were to investigate the relationship between care recipients' self-reported illness and daily afflictions and the frequency of HNC allocated to them, and to assess how the coping resources of the care recipients influenced the allocation of care to them.

2.5.3 Health, coping resources, and nursing home admission (paper III)

Many severely disabled older people prefer to remain living in their own homes rather than being cared for in a nursing home (68). Public health care providers support this attitude because the costs associated with long-term institutional care are very high and are predicted to increase substantially in the years to come. Therefore, it is important to determine the factors that influence the risk of NHA for elderly people who are dependent on nursing care.

Several studies have investigated the risk factors related to NHA based on the Andersen Behavioural Model (69). The demographic factors "higher age" and "living alone" are often reported to be significant predictors of NHA, whereas the influences of sex, economic status, and social support are still unclear (63, 64, 70).

An increasingly poor performance of ADL (63), poor SRH (71), high levels of psychological distress (72, 73), and dementia/cognitive impairment (74, 75) all consistently predict NHA.

SOC is defined as a general coping resource, influencing how a person copes with stressful events and environmental threats. Because SOC has been found to be strongly related to perceived health, especially perceived mental health (56), and has also been reported to predict future health outcomes - although these findings are not fully consistent (12, 56) - we anticipated that a person with a high level of SOC (i.e., the capacity to use available resources) would be motivated to continue living in his/her own home for a longer period than a person with a weak SOC.

2.5.4 The home nursing care recipient.

Traditionally, when planning services for elderly care recipients, emphasis has been placed on how various kinds of medical conditions lead to dependence on care, and on how to prevent the dependence caused by these conditions. In the research literature, a vast corpus of information points to several sources of dependence: functional impairment (problems with ADL functioning), dementia, psychiatric and somatic comorbidities (such as depression), the sequelae of stroke, accidents (fractures), and comorbidity.

However, an obvious weakness in community health care services is the lack of knowledge about the care recipients' personal background, networks, and emotional condition, and how they perceive their life situation. The coping skills and coping resources of the elderly are also likely to influence both their quality of life and their capacity for independent living. Therefore, it is necessary to determine the mechanisms that influence how elderly home-living care recipients maintain their capacity to cope. Only limited documentation exists concerning how coping abilities and skills contribute to independent living.

Our knowledge of the illnesses that lead to health breakdown in older people and how these may lead to dependence and ultimately to permanent institutional care is comprehensive and thorough (1). However, there is a striking deficit in our knowledge of the coping factors that maintain the health and self-care capacity of the elderly, and consequently their independence.

A major weakness in most studies performed on general populations of senior citizens has been that very old people (80 years and over), who are the predominant consumers of home care services, generally constitute only a moderate fraction of the samples. Therefore, knowledge is limited about the relationships between the care needs and disabilities of the oldest old people and the amount of care offered.

3.0 The main objectives of the constituent papers

To describe the characteristics of people receiving HNC:

- Age-related differences, characteristic socio-demographic background variables, health status, and coping capacities of older home-living care recipients.

To examine how home nursing recipients define their health:

- The associations between SRH and physical, functional, social, and mental health measures in older community-dwelling care recipients (paper I).
- How coping, defined as SOC, influences the relationship between SRH and physical, functional, social, and mental health measures in older community-dwelling care recipients (paper I).

To examine the mechanisms underlying the loss of independent living:

- Which GRRs and deficits influence the need for institutional care (paper II)?

To examine the allocation of HNC:

- Which physical, functional, social, and mental health conditions influence the allocation of care?
- Which socio-demographic conditions influence the allocation of care?
- What personal characteristics do nurses regard as essential when allocating care (paper III)?

To examine coping in home nursing recipients:

- Is the SOC scale an appropriate instrument to explain the capacity for independent living (paper II)?

To examine whether home nurses give priority to the overall goals of HNC put forward in the official plans for community care in Norway:

- Do nurses evaluate coping resources (GRRs) when allocating nursing care?

4.0 Methods

4.1 Setting

The setting for this study was seven municipalities in southern Norway. The random composition of the participating municipalities was based on a stratified distribution according to representative classifications in terms of industrial links, population density, and centrality (76). Both rural and urban municipalities were included. In the populous municipalities, the participants were extracted randomly. In the five rural communities, because there were few patients, all recipients of HNC were included.

4.2 Participants and data collection

The inclusion criteria were an age of 75 years or older, receiving HNC, and being able to understand the purpose of the investigation and to give autonomous consent, according to the nurses' judgement. The only exclusion criterion was difficulty in conversing with the research assistant.

The potential population of participants consisted of 348 individuals. Seventy-eight individuals (22.4%) refused to participate, nine died, and nine were permanently institutionalized before the data were collected. Ten interviews were not completed, resulting in a baseline sample of 242 respondents. Participants with missing data were excluded from the statistical analysis. An overview of the sample collection process is given in Figure 2.

The unit nursing officer (responsible for the allocation of nursing care services) in each of the participating offices was asked to identify the care recipients who fulfilled the inclusion criteria. The data were collected in the participants' homes by research assistants, all of whom were registered nurses and college staff members, with no previous relationship to the care recipients. The data were collected with an interview. The research assistants filled in the participants' answers on the

questionnaire forms. The data collection took about 90 minutes. Some data collection was completed over two or more sessions because the participants became fatigued. The baseline data were collected during the period 1998-2001, and the follow-up data were collected two years later. Registrations on the Clinical Dementia Rating Scale were performed by nurses in the HNC staff with extensive knowledge about the patient.

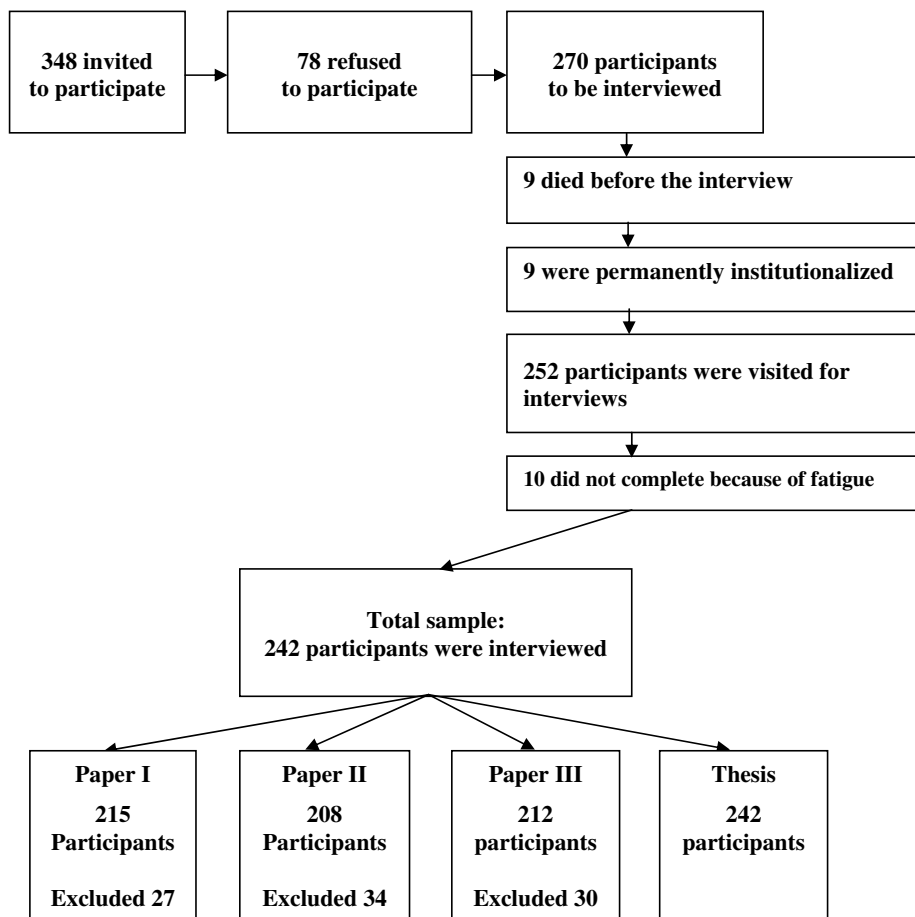


Figure 2. Flow chart of the study populations in the four studies of the thesis.

4.3 Instruments

4.3.1 Rating scales for socio-demographic resources (sex, age, and education)

Sex: men = 0, women = 1.

Education (paper I): Elementary school = 1, intermediate or vocational school = 2, and grammar school, college, or university training = 3; (papers II, III, and thesis): Less than/or elementary school or continuation school = 0 or further education = 1.

Household composition was recorded according to whether the care recipients lived with someone = 1 or did not = 0.

Economic situation was determined with the question “In general, do you have so much money that you can buy something extra now and then?” The answer categories were no = 1 (defined as Low in some of the statistical analysis) and yes = 2 (defined as High in some analysis).

4.3.2 Health resources (physical health, functional health, and subjective health)

Physical health

Reported illness was assessed using an eight-item checklist covering common physical diseases affecting older people: angina pectoris, congestive heart failure, hypertension, thyroid disease, diabetes, cancer, osteoarthritis, and osteoporosis. The total score ranged from 0 (no disorder) to 8.

Functional health

Function in ADL was assessed with the Barthel ADL Index (77), scored as recommended by (78). The instrument includes 10 basic functions: bowel and bladder functioning, feeding, grooming, dressing, transfer from bed to chair, toilet use, mobility, walking up stairs, and bathing. The total score ranges from 0 (dependent in all functions) to 20 (independent in all functions). The Barthel ADL

Index is a widely used, standard measure of ADL functioning (78, 79). The reliability of the index is well documented for stroke patients, but there remain uncertainties when it is used for older people, particularly people with cognitive impairment (80). In the study reported here, Cronbach's α was 0.82.

Subjective health

Subjective health complaints (SHC) were scored using the SHC Scale (81), which includes 30 items that register the subjective somatic and psychological complaints experienced during the past 30 days. The SHC instrument measures subjective experience, occurrence, intensity, and duration of health complaints in the categories: musculoskeletal pain, pseudoneurology, gastrointestinal problems, allergy, and flu. There is no focus on diagnoses (82, 83) and no reference to specific diagnostic categories. The individual scores range from 0 to 3, giving a total score on the measurement ranging from 0 (excellent) to 90 (poor).

The abbreviated Subjective Health Complaints Inventory (SHCI) (81) is a 22-item scale that registers subjective somatic and psychological complaints experienced during the past 30 days. The SHCI measures the subjective experience, occurrence, intensity, and duration of health complaints in three categories—musculoskeletal pain, pseudoneurology, and gastrointestinal problems—but without reference to specific diagnostic categories (83). The individual scores range from 0 to 3, with a total score ranging from 0 (excellent) to 66 (poor). The questionnaire has satisfactory validity and reliability (83). In the present study, Cronbach's α was 0.84.

Self-rated health (84) was measured with the question "How is your health now?" The answer categories were 1 = poor, 2 = not very good, 3 = good, and 4 = very good. SRH is a good predictor of future health status, as measured by mortality and morbidity (46, 85).

The Clinical Dementia Rating Scale (CDR) assesses the severity of cognitive impairment (86). It consists of a global score derived from six domains of cognitive

and functional performance: memory, orientation, judgement and problem-solving, community affairs, home and hobbies, and personal care. The sum (of boxes) score is given here according to the recommendations of (87). The instrument has been validated in several studies (88-93). Cronbach's α in the present study was 0.79.

The General Health Questionnaire (GHQ) with 30 items (94-96) was used to measure psychological distress. The GHQ measures the symptoms of depressed mood, anxiety, social inadequacy, and hypochondriasis. Each question is scored on a Likert scale of 0-3, giving a total score in the range of 0-90. A low score indicates an absence of psychological distress. The scale has been used in several Norwegian studies, and Dale, Soderhamn and Soderhamn (97) found satisfactory psychometric properties in the Norwegian version, used among older home living subjects. Cronbach's α in the present study was 0.92, and we found satisfactory construct validity reflected in a logical eightfactor solution that explained 70% of the variances (98).

The General Health Questionnaire (GHQ) with 12 items (94-96), designed for use in population studies, was used to measure psychological distress. The GHQ is a screening instrument that measures the symptoms of depressed mood, anxiety, social inadequacy, and hypochondriasis. The GHQ is especially concerned with the interface between psychological illness and psychological health, and has been found to be a valid instrument for assessing mental health, even in people with mild cognitive impairment (99, 100). Each question is scored on a Likert scale of 0-3, giving a total score in the range of 0-36. A low score indicates an absence of psychological distress. The scale has shown satisfactory screening properties (101). Cronbach's α in the present study was 0.82.

4.3.3 Housing situation

Living in their own home = 0, or in sheltered housing = 1.

4.3.4 Coping resources (*Sense of Coherence*)

Sense of coherence questionnaire (SOCQ) (also called the Orientation to Life Questionnaire) the 13-item version (4), was used to measure the coping resources and inner strength of the subjects in this study. SOCQ contains three sections: comprehensibility (five items), manageability (four items), and meaningfulness (four items). Antonovsky emphasized that the three components are dynamically interrelated, because the scale was developed to measure the global orientation, and the components should not be measured as distinct constructs (102). Each question is rated on a Likert scale ranging from 1 (lowest) to 7 (highest) that represents the level of coping resources, giving total scores that range from 13 (poor coping) to 91 (excellent coping). The analyses were performed according to Antonovsky's recommendations (103).

The SOC-questionnaire reflects a person's ability to use resources through cognition, structured behaviours, and being motivated to challenge life situations. The questionnaire has been used in multiple languages and exists in at least 15 versions (19).

Face validity is acceptable and consensual validity (correlating questionnaires with ratings made by external experts, concluding with an agreement that the measure is valid) (104) seems to be moderate (19). Several factor analysis seems to confirm the three dimensions of SOC, suggested by Antonovsky, however, some investigations does not show these dimensions (105).

SOC seems to be a multidimensional concept and not unidimensional as proposed by Antonovsky (19, 102). Criterion validity shows slight to good correlation with health indexes measuring mental health symptoms, strong negative correlations with anxiety/depression, and moderate correlations with instruments measuring life events. Strong predictive validity has been shown with regard to higher age (19).

The SOC scale thus appears to be a reliable, valid, and cross-culturally applicable instrument (19, 106). Cronbach's α in the present study was 0.80.

4.3.5 Social resources (social networks and social support)

Social network variables

Household composition (living with someone) was recorded as whether the care recipient was living with someone = 1 or was not = 0.

Seeing children and seeing friends were measured with the questions "How often are you together with...?" Irrelevant/never = 0, practically never = 1, once or a few times a year = 2, 1-3 times a month = 3, once a week = 4, several times a week = 5, or daily = 6.

Social support measures

The Revised Social Provisions Scale (107, 108) was used to assess the subject's social support. The SPS is based on Weiss's theoretical model of the provisions of social relationships (109). It originally consisted of six subscales: attachment, social integration, nurture, reassurance of worth, reliable alliance, and guidance. According to Weiss, the provisions will have different meanings in the various stages in life. The first four are most important to the oldest old and were therefore used in this study, as recommended by Cutrona and Russel (108) and Bondevik and Skogstad (37). Four statements assess each social provision. The total score for the complete 16-item version was used to assess the level of the subject's social support, and ranged from 16 (low social support) to 64 (high social support). The internal consistency of the scale has been shown to be good (108), and in the present study, the standardized item α was 0.81.

4.3.6 Health care resources (informal and formal care arrangements)

Frequency of home nursing care (HNC) offered by the community health care department: less than once a day = 0, once a day or more = 1. When HNC was used as a continuous variable in the analyses in this thesis: less than once a week = 1, 1-6 times a week = 2, once a day = 3, two or several times a day = 4.

Nursing home admission (NHA): The time (in months) of continued community residence (living at home) (n = 129), measured from baseline to the date of death or permanent institutionalization in a nursing home (n = 80).

Practical assistance from next of kin was recorded as: none/irrelevant, no help = 0, less than weekly = 1, 1-6 times a week = 2, 1-2 times a day = 3, or three or more times a day = 4.

Wishes to live now: elsewhere = 1, at home = 2.

Wishes to live in the future: elsewhere = 1, at home = 2.

Table 1. Sample size, design, data collection, measurements, and analysis used in the papers.

	Paper I	Paper II	Paper III	Thesis
Sample	N = 215	N = 208	N = 212	N = 242
Design	Cross-sectional	Longitudinal	Cross-sectional	Cross-sectional
Data Collection	Questionnaire/Interview	Questionnaire/Interview	Questionnaire/Interview	Questionnaire/Interview
Measurements	<p>Dependent variable: Self-rated health (SRH)</p> <p>Independent variables: Age and sex Education Household composition Subjective health complaints (SHC) Reported illness (RI) Sense of coherence (SOC) Barthel ADL Index (ADL) General Health Questionnaire (GHQ) (12-item version) Revised Social Provisions Scale (SPS)</p>	<p>Outcome variable: Time of continued community residence</p> <p>Independent variables: Age and sex Education Economic situation Household composition Seeing children and seeing friends Sense of coherence (SOC) Revised Social Provisions Scale (SPS) Subjective health complaints (SHC)</p> <p>Self-rated health (SRH) General Health Questionnaire (GHQ) (12-item version) Barthel ADL Index (ADL) Reported illness (RI)</p>	<p>Outcome variable: Frequency of home nursing care</p> <p>Independent variables: Age and sex Education Economic situation Household composition Housing situation Seeing children and seeing friends Sense of coherence (SOC) Revised Social Provisions Scale (SPS) Practical assistance from next of kin Subjective health complaints (SHC) Self-rated health (SRH) General Health Questionnaire (GHQ) (12- & 30-item versions) Barthel ADL Index (ADL)</p>	<p>Dependent variable: Subjective health complaints (SHC)</p> <p>Independent variables: Age and sex Education Economic situation Household composition Housing situation Seeing children and seeing friends Sense of coherence (SOC) Revised Social Provisions Scale (SPS) Practical assistance from next of kin Subjective health complaints (SHC) Self-rated health (SRH) General Health Questionnaire (GHQ) (12- & 30-item versions) Barthel ADL Index (ADL) Reported illness (RI) Frequency of home nursing care Frequency of home help Now, wishes to live at home In future, wishes to live at home</p>
Analysis	<p>Cronbach's α Pearson's correlation coefficient Independent-samples t test Chi-square test Multiple linear regression model Collinearity diagnostics</p>	<p>Cronbach's α Pearson's correlation coefficient Independent-samples t test Chi-square test Cox's proportional hazard model</p>	<p>Cronbach's α Pearson's correlation coefficient Point bacterial coefficient Phi correlation Independent-samples t test Chi-square test Multiple logistic regression model Multicollinearity diagnostics Curvilinearity diagnostics</p>	<p>Pearson's correlation coefficient Point biserial coefficient Phi correlation Independent-samples t test Chi-square test Multiple logistic regression model</p>

4.4 Statistical analyses

SPSS for Windows (Statistical Package of Social Science) version 12.1 was used for the data analysis in paper I, version 14.1 in papers II and III, and PASW version 18 (Predictive Analytics SoftWare) in the analysis in the present thesis. Overviews of the analysis used in the papers are given in table 1.

4.4.1 Analysis in paper I

Self-rated health was the dependent variable.

Bivariate correlations were tested with Pearson's correlation coefficient, and all tests were two-tailed with listwise deletion. Means were compared using an independent-samples t test. The χ^2 test was used to evaluate differences in nominal-level variables. Multiple linear regression models were used to test the effects of independent variables on SRH. Differences in the effect sizes between men and women were tested by interaction terms, one at a time, and the main effects were included in a multiple regression model (UNIANOVA, with a general linear model procedure). Collinearity diagnostics were used according to the recommendations in the SPSS linear regression model. Internal consistency was tested with Cronbach's α .

4.4.2 Analysis in paper II

The frequency of home nursing care was the dependent variable. The subjects' characteristics were summarized by calculating the means and SD for continuous variables and the absolute numbers and percentages for categorical variables.

Bivariate statistical associations were tested with Pearson's correlation coefficient for pairs of interval variables, the point biserial coefficient for dichotomous by interval variables, and phi for pairs of dichotomies; all tests were two tailed with listwise deletion. The reliability of internal consistency in sets of items was tested with Cronbach's α . An independent-samples t test was used to compare the mean scores between groups for continuous dependent variables, and a χ^2 test was used to explore

the relationships between categorical variables. Binary logistic regression models were used to assess the impact of the independent variables; blockwise entry into the model was used. Differences in the effect sizes of the levels of perceived social support (SPS) were tested with interaction terms, one pair at a time, and the main effects were retained in the logistic regression model. Multicollinearity and curvilinearity diagnostics were performed according to the recommendations of the SPSS logistic regression software (110).

4.4.3 Analysis in paper III

The time (in months) of continued community residence (living at home; $n = 129$), measured from baseline to the date of death or permanent institutionalization in a nursing home ($n = 80$), was the dependent variable.

Bivariate correlations were tested with Pearson's correlation coefficient; all tests were two tailed with listwise deletion. Internal consistency was tested with Cronbach's α . Means were compared using an independent-samples t test. χ^2 tests were used to evaluate differences in nominal-level variables. Cox's proportional hazard model was used to investigate the relationships between health and coping factors and the risk of institutionalization. A blockwise entry into the model was applied.

4.4.4 Analysis in the thesis

The subject characteristics were summarized by calculating the means and standard deviations (SD) for continuous variables, and the absolute numbers and percentages for categorical variables.

Bivariate statistical associations were tested with Pearson's correlation coefficient for pairs of interval variables, the point biserial coefficient for dichotomous by interval variables, and phi for pairs of dichotomies; all tests were two tailed with listwise deletion. Means were compared using an independent-samples t test. χ^2 tests were used to evaluate differences in nominal-level variables. Binary logistic regression

models were used to assess the impact of independent variables; a blockwise entry into the model was used.

4.5 Ethical aspects and approvals

Each participant received oral and written information and gave their written informed consent before the data were collected. The study followed the guidelines for community medicine research and was approved by the Regional Ethics Committee for Medical Research in Western Norway and by the Norwegian Data Inspectorate.

5.0 Results

5.1 General description of the study population

The mean age in the sample was 84.5 ± 5.1 years ($N = 242$). One hundred and seventy-one participants (70.7%) were women. The housing situations were considered as two groups: 168 (69.4%) lived in their own homes; 74 (30.6%) lived in sheltered accommodation. One hundred and eighty participants (74.4%) lived alone, 42 (17.4%) lived with a spouse, and 19 (7.9%) lived with another relative. Education level was recorded in three categories: 59.9% had an elementary school education or less, 31.4% had an intermediate school or vocational school education, and 8.7% had grammar school, college, or university training. For statistical purposes in this thesis, the categories were recoded into two levels: 97 persons (40.1%) had higher education and 145 persons (59.9%) had lower education (only elementary school or less). With regard to marital status, 18.2% were married, 13.6% were unmarried or divorced, and 68.2% were widowed. Women reported more subjective health complaints and more illnesses than men, and also had more frequent visits from their children. Men scored higher on cognitive impairment (Table 2). The basic statistics are presented in Tables 2 and 3.

Table 2. Descriptive statistics for the participants. Nominal independent variables. χ^2 test for differences in the scores for women and men ($N = 242$).

		Whole sample (n = 242)	Women (n = 171)	Men (n = 71)	χ^2
Socio-demographic variables					
Sex	Male	71 (29.3%)			
	Female	171 (70.7%)			
Education	Low	145 (59.9%)	107 (73.8%)	38 (26.2%)	0.191
	High	97 (40.1%)	64 (34.0%)	33 (34.0%)	
Economic situation	No, cannot buy something extra now and then	40 (16.5%)	30 (75.0%)	10 (25.0%)	0.509
	Yes, can buy something extra now and then	202 (83.5%)	141 (69.8%)	61 (30.2%)	
Housing situation	Living in own home	168 (69.4%)	116 (69.0%)	52 (31.0%)	0.406
	Living in sheltered housing	74 (30.6%)	55 (74.3%)	19 (25.7%)	
Social networks and social support					
Living with someone	No	180 (74.7%)	133 (73.9%)	47 (26.1%)	0.085

Table 3. Descriptive statistics for the participants. Continuous variables. Differences in means evaluated by *t* test.

	Whole sample (N = 242) Mean (SD) [Range]	Women (n = 171) Mean (SD)	Men (n = 71) Mean (SD)	<i>t</i> test Sig.
Socio-demographic variables				
Age	84.6 (5.16) [75-98]	84.8 (5.30)	84.2 (4.81)	-0.86
Health				
SRH	2.3 (0.74) [1-4]	2.3 (0.70)	2.4 (0.82)	1.18
GHQ 12	10.1 (2.97) [4-25]	10.2 (3.00)	9.8 (2.97)	-1.09
GHQ 30	24.6 (7.09) [9-55]	24.9 (7.10)	23.8 (7.10)	-1.09
SHC	9.1 (7.02) [0-39]	10.0 (6.70)	7.0 (6.75)	-3.05**
CDR	0.3 (0.58) [0-3]	0.2 (17.73)	0.4 (0.68)	2.11*
RI	1.5 (1.25) [0-5]	1.7 (1.24)	1.0 (1.13)	-4.25***
ADL	17.9 (2.89) [5-20]	17.7 (2.90)	18.2 (2.86)	1.27
Coping				
SOC	69.6 (9.03) [31-88]	69.4 (9.37)	70.7 (8.13)	0.28
Social networks and social support				
See children	3.6 (2.04) [0-6]	3.8 (1.92)	3.0 (2.22)	-2.77**
See friends	2.7 (1.40) [1-6]	2.6 (1.38)	2.7 (1.44)	0.45
SPS	52.7 (7.05) [30-64]	53.3 (6.38)	51.3 (8.31)	-1.85
Care assistance				
HNC	2.4 (1.06) [1-4]	2.44 (1.05)	2.35 (1.10)	-0.69
HH	1.4 (1.00) [0-4]	1.35 (0.91)	1.44 (1.13)	0.57
Help from kin	1.6 (1.15) [0-4]	1.57 (1.11)	1.53 (1.24)	-0.24

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Abbreviations: SRH, self-rated health; GHQ, General Health Questionnaire; SHC, subjective health complaints; CDR, clinical dementia rating; RI, reported illness; ADL, activities of daily living; SOC, sense of coherence; SPS, Social Provisions Scale; HNC, home nursing care; HH, home help.

5.2 Description and analysis of coping, measured as Sense of Coherence

The distribution of SOC scores showed a slightly negatively asymmetric distribution, indicating a high mean score in the study population, with the bulk of the respondents at the upper end of the range. The mean score was 69.75 (SD 9.03). The significant bivariate correlations between SOC and the other variables examined in the thesis are presented in Table 4.

Table 4. Bivariate correlations between SOC and the independent variables examined in this thesis. Pearson's correlation coefficient (A) and point biserial coefficient (B).

Age	0.200** ^A
Economy	0.131* ^B
Education	0.153* ^B
Seeing friends	0.146* ^A
SPS	0.319*** ^A
SHC	-0.341*** ^A
SRH	0.265*** ^A
GHQ	-0.495*** ^A
CDR	-0.164* ^A
ADL	0.140* ^A
RI	-0.155* ^A
HNC	-0.167** ^A
Wishes to live at home now	0.140* ^B
Wishes to live at home in the future	0.084

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Abbreviations: SPS, Social Provisions Scale; SHC, subjective health complaints; SRH, self-rated health; GHQ, General Health Questionnaire; CDR, clinical dementia rating; ADL, activities of daily living; RI, reported illness; HNC, home nursing care.

5.3 Analysis of background variables

Bivariate tests of the correlations between the group of background variables (age, sex, education level, and economic level) and the other independent variables examined in this thesis (socio-demographic variables, social networks and social support, health, coping, and care assistance) were performed with each demographic variable used as the dependent variable, one at a time. The significant relationships are shown in Tables 5-9. SOC correlated with all demographic variables, except sex. Thorough discussions of the general sex-based differences have been given in the papers cited in this thesis. Women were more often together with their nearest relatives and reported more illnesses and more health complaints, whereas men were slightly more cognitively impaired. Increasing age was associated with stronger SOC, better SRH, fewer SHC, less psychological distress, and less illness (Table 9). No correlation was observed between the amount of nursing care allocated and any background variable. To clarify the significant differences in the range of ages in this study population, age was divided into four groups (75-79, 80-84, 85-89, 90+ years), and line graphs of the effects of age on different variables are presented in Figure 3.

Table 5. Means, standard deviations, and ranges for the continuous independent variables within each sex group. Differences in means were evaluated by *t* test (N = 242).

	Sex		t	Sig.	
	Men (n = 71) (29.3%)	Women (n = 171) (70.7%)			
	Range	Mean (SD)	Mean (SD)		
How often are you together with children/children-in-law	1-6	3.0 (2.2)	3.8 (1.9)	-2.763	0.007**
Subjective health complaints	0-39	7.0 (6.6)	10.0 (7.0)	-3.046	0.003**
Clinical dementia rating (CDR)	0-3 ^{F1}	0.4 (0.7)	0.2 (0.5)	2.108	0.037*
Reported illness	0-5	1.0 (1.1)	1.7 (1.2)	-4.250	0.000***

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

F1: 198 persons were considered to be not mentally impaired (score = 0), 26 persons (10.7%) scored 1, 15 persons (6.2%) scored 2, and one person (0.4%) scored 3.

Table 6. Means, standard deviations, and ranges for continuous independent variables within each education level. Differences in means were evaluated by *t* test (N = 242).

	Education		t	Sig.	
	Low (N = 145) (59.9%)	High (N = 97) (40.1%)			
	Range	Mean (SD)	Mean (SD)		
SOC	31-88	68.6 (9.4)	71.4 (8.3)	-2.393	0.017*

* $P < 0.05$.

Abbreviations: SOC, sense of coherence; GHQ, General Health Questionnaire.

Table 7. χ^2 tests for differences between scores for education and economic situation (N = 242).

		Education		χ^2
		Low (n = 145)	High (n = 97)	
Economic Situation	No, cannot buy something extra	32 (80%)	8 (20%)	0.005**
	Yes, can buy something extra now and then	113 (55.9%)	89 (44.1%)	

** $P < 0.01$.

Table 8. Means, standard deviations, and ranges for continuous independent variables within each economic level. Differences in means were evaluated by t test (N = 242).

	Economic situation		t	Sig.	
	Low (n = 40) (16.5%)	High (n = 202) (83.5%)			
	Range	Mean (SD)	Mean (SD)		
SOC	31-88	67.1 (9.7)	70.3 (8.8)	-2.05	0.042*

* $P < 0.05$.

Abbreviation: SOC, sense of coherence.

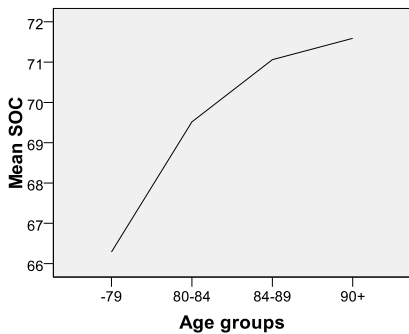
Table 9. Means, standard deviations, and ranges for continuous independent variables within two age groups (75-84 and 85-97). Differences in means were evaluated by t test (N = 242).

	Range	Age groups		t	Sig.
		Age 75-84 n = 128 (52.9%)	Age 85-97 n = 114 (47.1%)		
		Mean (SD)	Mean (SD)		
SOC	31-88	68.4 (9.7)	71.3 (8.0)	-2.56	0.011*
Subjective health complaints	0-39	10.1 (7.7)	8.0 (6.0)	2.43	0.016*
Self-rated health	1-4	2.2 (0.8)	2.5 (0.7)	-3.32	0.002**
GHQ-12	4-25	10.5 (3.3)	9.7 (2.6)	2.04	0.043*
Reported illness	0-5	1.7 (1.3)	1.2 (1.2)	2.89	0.004**

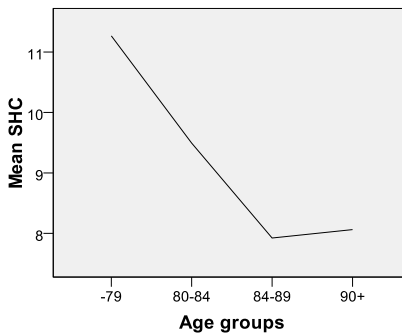
* $P < 0.05$; ** $P < 0.01$.

Abbreviations: SOC, sense of coherence; GHQ, General Health Questionnaire.

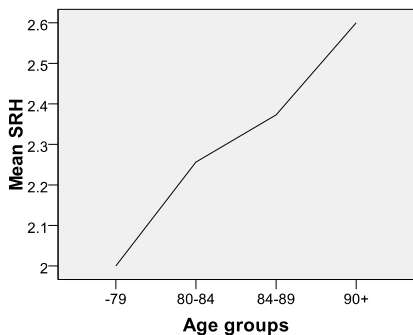
The mean SOC scores in the four age groups.



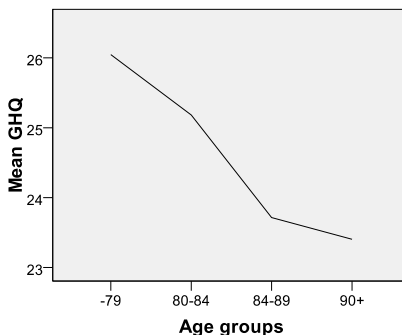
The mean SHC scores in the four age groups.



The mean SRH scores in the four age groups.



The mean GHQ scores in the four age groups.



The mean RI scores in the four age groups.

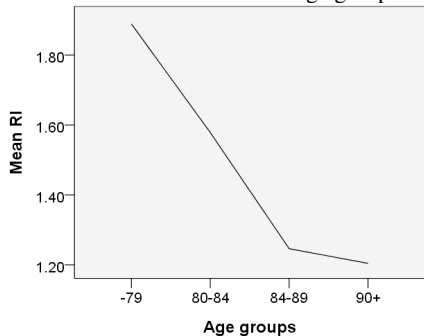


Figure 3. The distributions of the mean scores for SOC, SHC, SRH, GHQ, and I in the four age groups (97-79, 80-84, 85-89, 90+ years).

Abbreviations: SOC, sense of coherence; SHC, subjective health complaints; SRH, self-rated health; GHQ, General Health Questionnaire; RI, reported illness.

5.4 Analysis of health variables

5.4.1 Subjective, mental, and physical health

Nearly half the sample (42%) reported their overall health to be good. Very few (less than 2%) rated their health to be very good. More than 80% of the study population had no cognitive impairment. No subject was reported as having severe impairment. One in 16 participants had no illness, whereas about 75% had three diseases or more (Tables 10-12). A listing of the frequencies and percentage distributions of the illnesses evaluated is presented in Table 13. Impaired vision, impaired hearing, oedema in the legs, and urinary incontinence were reported in more than 40% of the study population. Of the illnesses included in the “registered illnesses” (used in the analysis), none correlated with both NHA and HNC, whereas only hyper/hypothyroid disease correlated with NHA. Cardiovascular diseases, cancer, osteoporosis, and nausea correlated with SRH, whereas most of the illnesses correlated with SHC and ADL functioning.

Descriptive statistics (N = 233).		Score	Frequency (percentage)
Mean	2.31	Poor health	1 33 (14.7%)
SD	0.74	Not good health	2 93 (41.5%)
Median	2	Good health	3 94 (42.0%)
		Very good health	4 4 (1.8%)

Descriptive statistics (N = 242).		Score	Frequency (percentage)
Mean	1.51	No impairment	0 198 (81.8%)
SD	2.54		1 26 (10.7%)
Median	0		2 15 (6.2%)
			3 1 (0.4%)
		Severe impairment	4 0

Descriptive statistics (N = 242).		Frequency (percentage)
		0 illnesses reported
		15 (6.2%)
		1
		36 (14.9%)
Mean	3.01	2
		53 (21.9%)
SD	1.82	3
		49 (20.2%)
Median	3	4
		43 (17.8%)
		5
		24 (9.9%)
		6
		12 (5.0%)
		7
		7 (2.9%)
		8
		1 (0.4%)
		9
		1 (0.4%)
		10
		1 (0.4%)

Table 13. Frequencies of specific reported diseases. Bivariate correlation with NHA (odds ratio [OR]) and with HNC, SRH, SHC, GHQ, and ADL (point biserial coefficient) (N = 242).

Illness	Included in "reported illnesses"	Frequency (percentage)	Correlation with NHA	Correlation with HNC	Correlation with SRH	Correlation with SHC	Correlation with GHQ	Correlation with ADL
Cardiac infarction		55 (22.7%) SM*	0.7	-0.10	-0.05	0.21**	0.11	0.04
Angina pectoris	X	53 (21.9%) SW*	1.06	-0.06	-0.14*	0.27***	0.07	0.02
Cardiac insufficiency	X	38 (15.7%)	0.26	-0.10	-0.15*	0.19**	0.14*	-0.01
Stroke		59 (24.4%) SM***	1.49	0.08	-0.15*	0.05	0.09	-0.17**
Hypertension	X	54 (22.3%)	1.08	-0.04	-0.14*	0.11	0.03	0.01
Hyper/hypothyroid	X	20 (8.3%)	0.28*	-0.18*	-0.03	0.10	0.04	0.15*
Diabetes	X	38 (15.7%)	1.08	0.02	-0.08	0.17**	0.05	-0.10
Cancer	X	39 (16.1%)	1.54	-0.01	-0.26***	0.04	-0.18**	-0.02
Arthritis	X	49 (20.2%) SW*	0.78	-0.03	-0.13	0.30***	0.07	0.00
Osteoporosis	X	65 (26.9%) SW***	0.89	-0.03	-0.13*	0.21**	0.15*	-0.01
Hypertrophic prostate		28 (11.6%) SM***	1.00	-0.11	0.03	-0.13*	-0.08	0.14*
Impaired vision		113 (46.7%)	1.05	-0.02	-0.01	0.23***	0.23**	0.04
Impaired hearing		118 (48.8%)	0.96	-0.06	0.03	0.05	-0.00	0.16*
Oedema in the legs		98 (40.7%) SW***	0.78	0.01	-0.05	-0.28***	0.11	-0.16*
Nausea		42 (17.4%)	1.38	-0.06	0.18**	0.40***	0.15*	-0.02
Urinary incontinence		102 (42.3%) SW**	0.81	0.04	0.11	0.13	0.06	-0.17**

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Abbreviations: NHA, nursing home admission; HNC, home nursing care; SRH, self-rated health; SHC, subjective health complaints; GHQ, General Health Questionnaire; ADL, activities of daily living; SW, significantly higher values in women; SM, significantly higher values in men.

5.4.2 Functional health

A list of the frequencies and percentage distributions of the subgroups on the ADL scale is presented in Table 14. Most of the subgroups correlated with both NHA and HNC. Most items correlated with SRH, except for problems with bowels, bladder, and mobility. Problems with feeding, dressing, and walking up stairs correlated with SHC, whereas only feeding correlated with psychological distress.

Table 14. Frequencies in specific areas of ADL functions. Bivariate correlations with NHA, HNC, SRH, SHC, and GHQ (point biserial coefficient) (N = 242).

	Functions	Frequency (percentage)	Correl. w NHA	Correl. w HNC	Correl. w SRH	Correl. w SHC	Correl. w GHQ
Bowel (preceding week)	Incontinent/enemas	0					
	Occasional accident	8 (3.3%)	-0.04	0.03	-0.08	0.05	-0.03
	Continent	234 (96.7%)					
Bladder (preceding week)	Incontinent/catheter	16 (6.6%)					
	Occasional	30 (12.4%)	0.06	-0.13*	0.05	-0.09	-0.01
	Continent	196 (81.0%)					
Feeding	Dependent	0					
	Needs help	28 (11.6%)	-0.11	-0.41***	0.27***	-0.16*	-0.20**
	Independent	214 (88.4%)					
Grooming preceding 24-48h	Needs help	16 (6.6%)	-0.20**	-0.35***	0.09	-0.04	-0.09
	Independent	226 (93.4%)					
	Dependent	9 (3.7%)					
Dressing	Needs help	24 (9.9%)	-0.16*	-0.39***	0.23**	-0.16*	-0.18
	Independent	209 (86.4%)					
	Dependent. No sitting balance	0					
Transfer	Major help (can sit)	9 (3.7%)	-0.18*	-0.33***	0.17*	-0.02	-0.09
	Minor help	8 (3.3%)					
	Independent	225 (93.0%)					
Toilet use	Dependent	5 (2.1%)					
	Needs some help	9 (3.7%)	-0.19**	-0.24**	0.19**	-0.05	-0.08
	Independent	228 (94.2%)					
Mobility	Immobile	4 (1.7%)					
	Wheelchair dependent	15 (6.2%)	-0.09	-0.33***	0.12	-0.05	-0.08
	Walks with help of one person	3 (1.2%)					
Stairs	Independent	220 (90.9%)					
	Unable	50 (20.7%)					
	Needs help	40 (16.5%)	-0.13*	-0.42***	0.20**	-0.13*	-0.08
Bathing	Independent	152 (62.8%)					
	Dependent	128 (52.9%)	-0.12	-0.36***	0.16*	-0.05	-0.12
	Independent	114 (47.1%)					

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Abbreviations: Correl. w, correlation with; ADL, activities of daily living; NHA, nursing home admission; HNC, home nursing care; SRH, self-rated health; SHC, subjective health complaints; GHQ, General Health Questionnaire.

5.5 Analysis of social networks

Nearly 20% of subjects had no relationship with their own children, or were childless, and an additional 10% of the participants had very meagre relationships with their children. Nearly half the study population reported 1-6 meetings per week with their children, and 16% saw them every day. One in every four subjects practically never met friends, and half of all participants had only a few such meetings per year. About 20% reported 1-6 meetings with friends per week, and 3.3% met with friends every day. The frequencies of social visits in the subjects' own homes or in sheltered housing were evaluated, but did not differ significantly (Tables 15 to 17).

Table 15. Seeing children/children-in-law and friends/acquaintances. Frequencies and percentages (N = 242).

	Score	How often do you meet with:	
		Children/children-in-law	Friends/acquaintances
No relations or childless	0	43 (17.8%)	
Practically never	1	1 (0.4%)	59 (24.4%)
Once or a few times a year	2	24 (9.9%)	63 (26.0%)
1-3 times a month	3	28 (11.6%)	63 (26.0%)
Once a week	4	37 (15.3%)	22 (9.1%)
Several times a week	5	70 (28.9%)	26 (10.7%)
Every day	6	39 (16.1%)	8 (3.3%)

Table 16. Differences in the frequencies of visits from children/children-in-law and friends/acquaintances between participants living in their own homes and those in sheltered housing. Mean and SD. Differences in means were evaluated with t tests (N = 242).

	Living in own home	Living in sheltered housing	t	Sig.
	(N = 168) Mean (SD)	(N = 74) Mean (SD)		
Visits from children/children-in-law	3.6 (2.14)	3.5 (1.80)	0.55	0.584
Visits from friends/acquaintances	2.6 (1.39)	2.9 (1.41)	-1.45	0.239

5.6 Analysis of care and assistance

Forty-three participants (17.8%) received home nursing once a day, 55 (22.7%) received more than two visits daily, and 16 care recipients (6.6%) were also visited during the night. One hundred and thirty-five individuals (55.8%) received 1-7 visits per week, whereas 52 individuals (21.5%) received nursing care less than once a

week (Table 17). One hundred and eighty-two care recipients (75.2%) also received municipal home help (Table 18). Almost 20% had no help from kin, and a further 29% reported that they received help less than weekly; 15% received help once a day or more (Table 19).

Table 17. Frequency (percentage) of home nursing care visits for the whole sample (N = 242) and for men and women individually.

	Whole sample	Women (N = 171)	Men (N = 71)
Less than once a week	52 (21.5)	34 (19.9)	18 (25.4)
Once to six times a week	92 (38.0)	66 (38.6)	26 (36.6)
Once a day	43 (17.8)	32 (18.7)	11 (15.5)
Two times or more per day	55 (22.7)	39 (22.8)	16 (22.5)

Table 18. Frequency (percentage) of home help visits for the whole sample (N = 242) and within men and women individually.

	Whole sample	Women (N = 171)	Men (N = 71)
No home help	56 (23.1)	36 (21.1)	20 (28.2)
Less than weekly	65 (26.9)	52 (30.4)	13 (18.3)
Once a week	100 (41.3)	72 (42.1)	28 (39.4)
Two to five times a week	16 (6.6)	9 (5.3)	7 (9.9)
Six times a week or more	5 (2.1)	2 (1.2)	3 (4.2)

Table 19. Frequency (percentage) of help from kin for the whole sample (N = 242) and for men and women individually.

	Whole sample	Women (N = 171)	Men (N = 71)
No family assistance	48 (19.9)	30 (17.5)	18 (25.7)
Less than weekly	69 (28.6)	54 (31.6)	15 (21.4)
Once to six times a week	88 (36.5)	61 (35.7)	27 (38.6)
Once to two times a day	14 (5.8)	12 (7.0)	2 (2.9)
More than two times a day	22 (9.1)	14 (8.2)	8 (11.4)

There were no differences in the frequency of HNC between the care recipients who were living alone and those living with someone, or between women and men (Tables 20 and 21, respectively). In contrast, such differences were found in both the frequency of home help visits and in help from kin. Both women and men received more home help if they lived alone, but more help from kin if they lived with someone else (Tables 20 and 21, respectively).

More than 40% of the participants reported that they received practical assistance from a child, whereas close relatives, neighbours, and friends were also significant contributors to many of the respondents (Table 22).

More than half the respondents required assistance with showering and bathing, and the vast majority of these received help from home nurses or home help. This was also the case for those requiring assistance with daily washing of the body. There was clearly more help from family with practical tasks, such as cleaning the house, cooking, and shopping (Table 23).

Table 20. Differences in the frequencies of home nursing care (HNC), home help (HH), and help from kin in subjects living alone or together with someone else. Means and SD. Differences in the means were evaluated with t tests (N = 242).

	Whole sample (N = 242) Mean (SD)	Living alone (n = 180) Mean (SD)	Living with someone (n = 61) Mean (SD)	t	Sig.
Frequency of HNC visits	2.4 (2.42)	2.5 (1.08)	2.3 (1.04)	1.05	0.294
Frequency of HH visits	1.4 (1.38)	1.5 (0.94)	1.0 (0.99)	3.70	0.000***
Frequency of help from kin	1.6 (1.56)	1.2 (0.84)	2.5 (1.37)	-6.97	0.000***

** $P < 0.01$; *** $P < 0.001$.

Table 21. Differences in the frequencies of home nursing care (HNC), home help visits (HH), and help from kin in women and men living alone or with someone else. Means and SD. Differences in the means were evaluated with t tests (N = 242).

		Living alone Men: n = 47 Women: n = 133 Mean (SD)	Living with someone Men: n = 23 Women: n = 38 Mean (SD)	t	Sig.
Men	Frequency of HNC visits	2.5 (1.16)	2.2 (0.98)	0.97	0.335
	Frequency of HH visits	1.7 (1.11)	0.8 (0.94)	3.32	0.001**
	Frequency of help from kin	1.2 (0.89)	2.3 (1.51)	-3.24	0.003**
Women	Frequency of HNC visits	2.5 (1.05)	2.4 (1.08)	0.50	0.615
	Frequency of HH visits	1.4 (0.86)	1.1 (1.02)	2.11	0.036*
	Frequency of help from kin	1.3 (0.82)	2.7 (1.28)	-6.56	0.000***

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Table 22. Practical assistance from people other than the Municipal Health Services. Frequencies (percentages) (N = 242).

	Frequency (percentage)
Husband/Wife/Cohabiter	32 (13.2%)
Son(s)	105 (43.4%)
Daughter(s)	113 (46.9%)
Son(s)-in-law	58 (24.0%)
Daughter(s)-in-law	55 (22.7%)
Grandchildren/Great-grandchildren	47 (19.4%)
Brothers and sisters/Other relatives	34 (14.0%)
Neighbours/friends/Acquaintances	60 (24.8%)
Others	12 (4.9%)

Table 23. Survey of assistance needs and providers of help. Frequencies (percentages) (N = 242).

	Self-supporting	Spouse/ Cohabiter	Daughter/ Daughter-in-law	Son/Son-in- law	Home nurses	Home help/Others in the community	Neighbours/ friends	Others
Daily washing of body	210 (86.8%)				29 (12.0%)	2 (0.8%)	1 (0.4%)	
Shower/bath	115 (47.5%)	2 (0.8%)	2 (0.8%)		101 (41.7%)	22 (9.1%)		
Toilet	227 (93.8%)	6 (2.5%)			8 (3.3%)	1 (0.4%)		
Care of the hair/shampoo	122 (50.4%)	1 (0.4%)	9 (3.7%)	1 (0.4%)	70 (28.9%)	29 (12.0%)	1 (0.4%)	9 (3.7%)
Cleaning the house	17 (7.0%)	11 (4.5%)	9 (3.7%)	3 (1.2%)	3 (1.2%)	177 (73.1%)	1 (0.4%)	20 (8.3%)
Shopping for food	102 (42.1%)	19 (7.9%)	32 (13.2%)	29 (12.0%)	1 (0.4%)	38 (14.9%)	14 (5.8%)	9 (3.8%)
Cooking dinner	137 (56.6%)	17 (7.0%)	8 (3.3%)	4 (1.7%)	5 (2.1%)	67 (27.7%)	2 (0.8%)	1 (0.4%)
Minor repairs to the house	40 (16.6%)	15 (6.2%)	11 (4.5%)	67 (27.7%)	1 (0.4%)	59 (24.4%)	16 (6.6%)	32 (13.5%)
Gardening	63 (26.0%)	13 (5.4%)	11 (4.5%)	45 (18.6%)	1 (0.4%)	60 (24.8%)	13 (5.4%)	35 (14.4%)

The assistance or help from kin and community home help varied with the subjects' home situations. Help from kin was most frequent in home-living care recipients, and municipal home help was most frequent in individuals living in sheltered housing (Table 24).

Table 24. Differences in the frequency of home help (HH) visits and help from kin in subjects living in their own homes or in sheltered housing. Mean and SD. Differences in the means were evaluated with t tests (N = 242).

	Range	Housing situation		<i>t</i>	Sig.
		Own home (n = 168, 69.4%)	Sheltered housing (n = 74, 30.6%)		
		Mean (SD)	Mean (SD)		
Frequency of help from kin	0-4	1.7 (1.2)	1.3 (0.9)	3.11	0.002**
Frequency of HH visits	0-4	1.2 (1.0)	1.7 (0.8)	-3.95	0.000***

** $P < 0.01$, *** $P < 0.001$.

6.0 Results reported in papers and additional analyses

6.1 Paper I: Self-rated health and coping in older persons receiving home nursing care

Hierarchical regression showed that subjective health complaints (SHC) were directly associated with self-rated health (SRH) in women and men, whereas they were associated with psychological distress only in men. However, coping resources (SOC) were directly associated with SRH, and indirectly associated with SRH through subjective perceived health (SHC and GHQ), but all these associations were found only in men. The influence of reported illness was mediated through the effects of subjectively perceived health in both women and men. The effects of SOC on SRH differed between the sexes. The results indicate that subjectively perceived health was more important in SRH than were objective health measures. Men, in contrast to women, tended to convert physical illness into emotional distress. These results are presented in Table 25.

Table 25. Self-rated health: standardized regression coefficients and adjusted R², blockwise hierarchical models for women and men (N = 215).

	Self-Rated Health									
	Women (n = 150)					Men (n = 65)				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 1	Model 2	Model 3	Model 4	Model 5
	r	β	β	β	β	r	β	β	β	β
Age	0.243**	0.204*	0.147	0.133	0.108	0.243**	0.134	0.034	0.038	0.112
Education	-0.042	-0.037	-0.077	-0.089	-0.113	-0.248*	-0.136	-0.170	-0.148	-0.103
LwS	-0.245**	-0.217**	-0.165*	-0.163*	-0.134	0.037	0.014	0.043	0.064	0.034
RI	-0.297***	-0.248**	-0.245**	-0.156	-0.153	-0.356**	-0.336**	-0.278*	-0.134	-0.120
ADL	0.146	0.128	0.115	0.097	0.094	0.274*	0.240	0.180	0.137	0.155
SOC	0.159	0.105	0.105	0.033	0.013	0.522***	0.443***	0.328*	-0.046	0.070
SPS	0.065	0.065	0.006	0.056	0.043	0.200	0.043	-0.146	-0.215	-0.248*
GHQ-12	-0.106	-0.106	-0.305**	-0.313***	-0.313***	-0.454***	0.080	-0.215	-0.215	-0.286*
SHC	-0.401***	0.086	0.143	0.148	0.198	-0.524***	0.194	0.374	0.390	0.337
Adj. R ²										

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$, analysed with listwise deletion.

Abbreviations: LwS, living with someone; RI, reported illness; ADL, activities of daily living; SOC, sense of coherence; SPS, Social Provisions Scale; GHQ-12, 12-item General Health Questionnaire; SHC, subjective health complaints.

6.2 Paper II: Allocation of Home Nursing Care

A binary logistic regression model showed that a poor capacity to perform ADL and a high level of education were directly associated with high levels of HNC. Perceived social support (SPS) did not directly affect the amount of HNC allocated, but did so when feelings of loneliness were associated with poor ADL functioning. SOC was not related to the allocation of care. A particularly vulnerable group seemed to be care recipients with low perceived social support combined with a low education level. These results are presented in Table 26.

Table 26. Predictors of frequency of home nursing care. Univariate and multiple logistic regressions. Odds ratios (ORs) and 95% confidence intervals (CIs) in the best-fit models (N = 212).

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6 without ADL
	Univariate (OR)					
Sex (male-female)	1.17	1.30	1.21	1.15	0.88	0.95 (0.43-2.09)
Age	0.99	0.99	0.98	0.10	1.01	1.01 (0.94-1.08)
Education (<i>H</i> = <i>High education</i>)	2.28**	2.32**	2.40**	2.61**	3.55***	3.41** (1.69-6.87)
LWS (<i>Yes</i>)	0.61	0.68	0.68	0.64	0.48	0.51 (0.21-1.23)
Hous Cond (<i>L</i> = <i>Own</i> , <i>H</i> = <i>Sheltered</i>)	1.62	1.66	1.66	1.66	1.32	1.37 (0.65-2.92)
SOC	0.98			0.97	0.97	0.98 (0.94-1.02)
SRH	0.77			0.83	1.05	1.08 (0.65-1.79)
CDR	1.06			1.01	0.99	0.99 (0.85-1.15)
ADL	0.64***			0.61***	0.62***	0.62*** (0.51-0.75)
SPS	0.97**				0.97	0.97 (0.92-1.03)
						0.94* (0.90-0.99)

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$. L = low, H = high.

Abbreviations: LWS, living with someone; Hous Cond, housing situation; SOC, sense of coherence; SRH, self-rated health; CDR, clinical dementia rating; ADL, activities of daily living; SPS, Social Provisions Scale.

6.2.1 Additional results

The complete version of the Social Provisions Scale was used to investigate the predictors of HNC frequency. The results of this investigation clearly indicate that the perception of social provisions is important in the lives of older care recipients. Therefore, to better understand the mechanisms underlying perceived social support, further analyses were performed with the different SPS subgroups. Attachment, nurture, reassurance of worth, and social integration were included in the equation, one at a time, rather than the complete SPS.

The results revealed that social integration and nurture were related to the frequency of HNC, but only when feelings of loneliness were associated with poor ADL functioning. The results are presented in Table 27.

Table 27. Predictors of HNC frequency. Univariate and multiple logistic regressions. Odds ratios (ORs) and 95% confidence intervals (CIs) in the best-fit models (N = 212).

	Univariate (OR)	Model with social integration (ADL not included)		Model with nurture (ADL not included)	
		Multivariate (OR and CI)			
Sex	1.17	1.34	(0.69-2.59)	1.28	(0.66-2.48)
Age	0.99	0.99	(0.94-1.05)	0.99	(0.94-1.05)
Education	2.28**	2.40**	(1.32-4.36)	2.59**	(1.14-4.72)
LwS	0.61	0.59	(0.29-1.21)	0.87	(0.42-1.82)
Hous Cond (<i>L=Own, H=Sheltered</i>)	1.62	1.67	(0.88-3.17)	1.62	(0.85-3.10)
SOC	0.98	0.98	(0.95-1.02)	0.98	(0.95-1.01)
SRH	0.77	0.86	(0.57-1.31)	0.90	(0.59-1.37)
CDR	1.06	1.08	(0.96-1.21)	1.05	(0.93-1.18)
ADL	0.64***	Not included in model		Not included in model	
SI (H = high perceived support)	0.68**	0.87*	(0.77-0.99)		
Nurture (H = high perceived support)	0.85***			0.87**	(0.79-0.96)

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$. L = low, H = high.

Abbreviations: LwS, living with someone; Hous Cond, housing situation; SOC, sense of coherence; SRH, self-rated health; CDR, clinical dementia rating; ADL, activities of daily living; SI, social integration; Nurture, nurturance.

6.3 Paper III: Health and coping resources and nursing home admission

A Cox proportional model was used to examine the factors that explained the risk of NHA. Problems with ADL at the initial assessment, a perception of poor social support (SPS), poor self-rated health (SRH), impaired cognitive capacity (as assessed by CDR), and being male were associated with an increased risk of NHA. SOC, together with SHC, psychological distress (GHQ), reported illnesses (RIs), and social visits did not predict NHA. Therefore, the subjective evaluations of the care recipients of both their health and perceived social support were important predictors of future NHA needs, together with the more commonly used objective measures of ADL and mental functioning (CDR). The results are presented in Table 28.

Table 28. Risk of institutionalization or death in a period of two years after the baseline interview (N = 208).

	Bivariate hazards ratio	Model 1 hazards ratio	Model 2 hazards ratio	Model 3 hazards ratio	Model 4 hazards ratio
Sex	0.528**	0.542**	0.526**	0.584*	0.569*
Education	1.336	1.256	1.293	1.207	1.139
SOC	0.989		0.984	1.000	1.027
Seeing friends	0.844*			0.906	0.863
SPS	0.934***			0.944**	0.959*
SRH	0.586**				0.684*
GHQ-12	1.082*				1.070
CDR	1.972***				1.475*
ADL	0.867***				0.899**

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Abbreviations: SOC, sense of coherence; SPS, Social Provisions Scale; SRH, self-rated health; GHQ-12, 12-item General Health Questionnaire; CDR, clinical dementia rating; ADL, activities of daily living.

Comment to Table 28:

Univariate analysis of each independent variable at baseline interview, and multivariate effects controlled for all independent variables. (Dependent events = patient died or was permanently institutionalized in the period.) Cox regressions, blockwise hierarchical model. Bivariate and controlled hazards ratios.

6.4 Model of relationships between the independent variables and the need for home nursing care or institutional care

In order to illustrate some of the main questions put forward in this thesis, a model is presented in Figure 4.

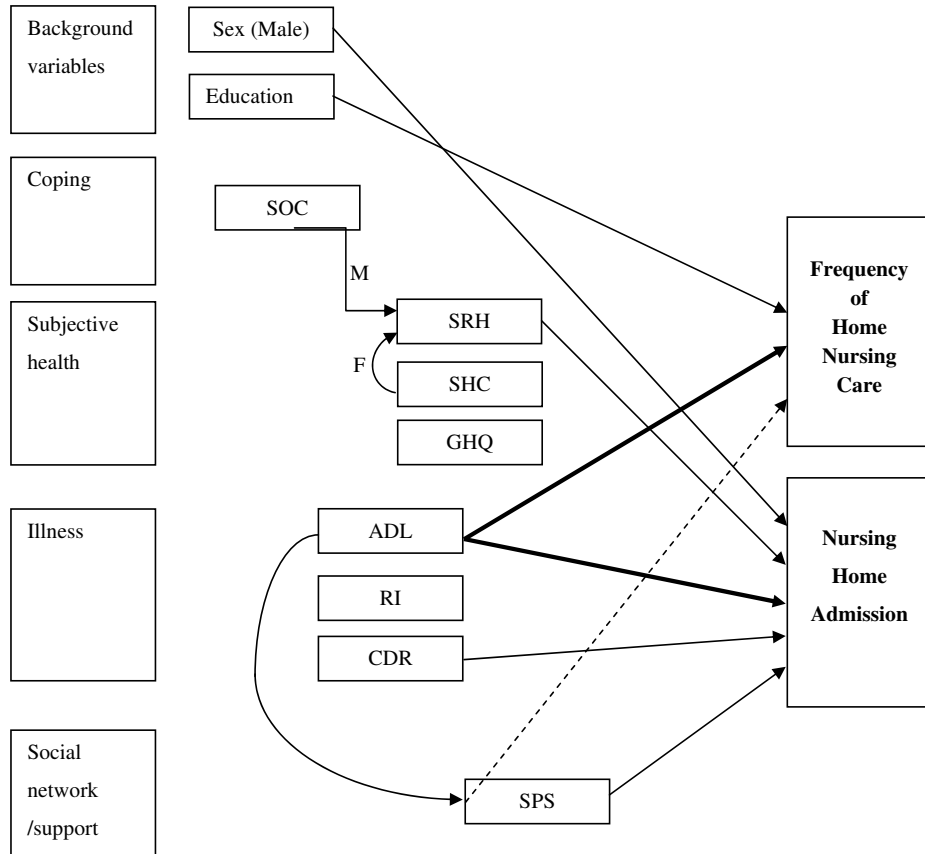


Figure 4. Model illustrating the relationships between the independent variables and the need for HNC or institutional care (N = 242).

7.0 Discussion

7.1 Methodological issues

7.1.1 Study design

This study intended to monitor the health and social conditions and the formal and informal assistance in a sample of older HNC patients. We therefore decided to perform personal interviews, conducted by a trained nurse, to gather information given by the patient (self-report), rather similar to the procedures that are common when nurses assess care needs when meeting the patients the first time. Thus, a cross-sectional survey was chosen. Performing interviews in a patient sample may bring along threats to the validity and reliability that need to be considered.

7.1.2 Sample

Composing the sample

The composition of this sample reflects the national distribution of communities with regard to industrial links, population density, and centrality (76). It is, however, important to note that it was not intended to compare services between municipalities, for this purpose the number of participants from each municipality was too small.

We implemented several measures to reduce threats to the study's reliability and validity. Identical letters were sent to all participating municipalities with information about the project. In addition to this, the HNC-units were visited by the project leader and given oral information. The nurses that informed the patients, asking for participation, were informed about procedures. All of the participating nurses brought an identical letter to the patients. This ensured similar procedure for inclusion and exclusion of participants, which strengthens the external validity of the project.

Exclusion criteria were given as both written and oral information to the unit nursing officers. The excluded patients had difficulties in conversing with the research

assistant or were not able to give an autonomous consent. We know this included cognitively impaired persons, but except this, we do not know the reasons for exclusion. This could be considered to be a weakness. There is reason to believe that amongst those who would not participate, there were a large proportion of individuals with significant impairment, both physically and mentally (111). However, the fact that about 80% of those who were invited to participate actually did consent to meet with the research assistant should be considered as a fairly representative share of the patient population (112).

The cross sectional design does not give any causal explanation of the variables included. Since data collection in this investigation is rather similar to the procedures that are performed when the nurses initiates their work in the home of the patient, we assume that this way of collecting data provides a valid picture of the patient's condition.

Performing the interviews

Before starting the interviews, several measures were taken to secure similar procedures. First, 14 pilot interviews were performed, in order to investigate how the questionnaire functioned, and how this influenced the collaboration between the researcher and the patients. Several adjustments were done. Seven of the interviews connected to the “pilot-project” were included in the final sample analysis. All interviewers (trained nurses) were given written and oral information about the project, and questions concerning how to perform an interview were emphasized. After a few interviews were completed, a second meeting was held to address the experiences and ensure equal performance. Through these measures we prevented random errors that could occur if questions were misunderstood, and also secure rather similar ways of performing the interviews.

A possible weakness with a personal interview is the risk of bias connected to personal characteristics like the tendency to answer the way the patient believes is (113) expected (agreement-bias) or feeling unease because of fear that answers will

give negative consequences regarding the HNC-unit (lack of confidentiality) (112). The fact that trained nurses performed the interviews, and were aware of these threats, diminish this risk of such bias. This also made it possible to resolve misunderstandings, and the context created when the interviewers sat down with the patients, probably reduced experience of haste and disorder, and contributed to increased concentration (112).

Personal interviews do have several advantages. If self-administered questionnaires were given to the patients, it is likely to believe that fewer subjects would participate, particularly the most impaired. Furthermore it would give less opportunity to include many questions and clearing up difficult question or misunderstandings. Tiredness and long sequences of similar questions may give method effects (like extremity bias), and this was a problem that was known to the interviewers in advance of the interviews. Several interviews were divided in sections over two days. Thus, the way we conducted the interviews, improved the validity of the results.

7.1.3 The instruments

Single item questions, questions concerning health, provision of health care

Questions were accurately worded, reducing the risk of agreement bias (social desirability), and response sets. Particularly in older subject, and in persons with low education, this is a threat to the validity (114).

Scales included in the study

Most of the scales included in the questionnaire were well-tested and previously often used in research. These are thoroughly presented in the method chapter.

The relatively unexpected low levels of psychological distress and subjective health complaints do reflect the actual situation of this sample but may be somewhat difficult to explain. It must be observed that the mean age is high (84.9 years), and several studies reports that e.g. depression rate seems to be lower with increasing age

(113, 115-118). However, some studies report the opposite, age-related increase in depression reported in some studies is possibly related to multi-morbidity or co-morbidity (113, 119). The prevalence of late-life depression is somewhat difficult to determine, since this seems to be influenced by the diagnostic methods being used; using a depression-scale usually gives a higher prevalence than using established diagnostic criteria.

Particularly with regard to aspects concerning subjective well-being, one should consider both the cohort and the survival effects. Older people tend to be non-complaining and therefore often underreport both psychological distress and health complaints (120). Receiving visits from the home nurses may moreover in itself contribute to better psycho-social well-being. The survival effect implies that persons with both physical and psychiatric morbidity in old age may die earlier (121), and this may also explain the lower levels of both physical and functional health in this sample.

Most of the patients suffering from cognitive impairment were not included, as this was an exclusion criterion. This may be seen as a limitation. However, the screening with the CDR-scale was done to identify subjects in an early stage of cognitive decline, and monitor both present and future characteristics. The group of slightly impaired patients is important to include since these patients still have resources that can be supported through HNC, in order to remain in their own houses.

Statistical analysis

After the interviews were completed, the answers were coded into SPSS, and two independent controls were performed in order to avoid random errors. It is important to notice that in the articles, multiple regression analyses were performed, causing exclusion of all respondents with a missing data in the equation. Therefore, the number of respondents in these analyses are different from the overall analysis of the sample, presented in this thesis.

7.1.4 External validity and representativeness

The sample size is relatively low and the fact that we do not know the health condition of those who refused to participate, implies that generalization to other HNC patients groups must be done with caution. The lack of test of inter-rater reliability may also be seen as a weakness. However, the thorough construction of the survey, where several measures were carried out in order to secure reliability during the interviews, the relatively moderate number of refusals, the use of easily understandable questions and well tested scales, is a strength of this investigation.

Some reservations must be made when studying a selected group of elderly patients. The distribution of characteristics may be more homogeneous than in a general population sample of elderly people. A high mean age probably also neutralizes some of the commonly described sex-based differences in samples of older people, because people aged 80 years or more may be regarded as survivors, and therefore tend to be more similar with regard to their socio-demographic characteristics. Although the sample is rather homogenous, the level of internal consistency (Cronbach's alpha) in the scales are good, indicating that the measures used were functioning satisfactorily in the sample (112).

Performing such a survey in a sample of vulnerable patients is demanding with regard to resources, and is seldom carried out at this extent in Norway. A particular strength of the investigation is that it is done relatively similar to the working methods of the HNC-units. The fact that the patients were answering questions regarding the present situation diminishes the risk of bias caused by forgetfulness. HNC staff usually makes decisions based on such information. It may be argued that altered health status were not recorded in connection with death or admission to an institution (Article II), but measuring how baseline data predict future care needs, adds knowledge that can improve the understanding of the initial assessment of health and social conditions.

7.2 General discussion

Although the focus of this project is necessarily limited, some aspects must be emphasized. One purpose of the study was to gain knowledge about the patients from their own perspective, so it was important to assess information concerning their objective and subjective health and their social situation. Emphasis was also given to services provided by the HNC units. Because the goals of HNC in Norway clearly stress the provision of assistance that will enable elderly individuals to continue dwelling in the community, it was important to investigate the potential coping factors that contribute to this.

The theoretical approach selected when designing this project was the salutogenic perspective on health. The advantage of using a theoretical framework is that it can help in identifying new approaches to research within a field that may otherwise go unrecognized. In particular, a theoretical model can be useful when applying an analysis and its results to clinical practice (112).

7.2.1 A strong Sense of coherence did not predict independent living

The coping resource, measured as Sense of Coherence (SOC) was not associated with the individuals' ability to remain in their own homes for a longer period of their lives, or with less need for formal assistance. This contradicted our hypothesis, which was based on previous findings that a strong SOC is a dispositional orientation that reflects a person's capacity to respond to challenging or stressful situations (a general feeling of exerting control and being able to influence one's own life) (4, 12), and that people with a strong SOC tend to have more education, better health, and stronger perceived social support/integration into society than people with a weak SOC (56), which means they are normally more likely to manage difficult life situations. However, SOC did correlate with most of the variables tested, which clearly indicates that it plays a role in people's lives.

High SOC scores were related to greater age, indicating better coping abilities among the oldest care recipients. This is consistent with the results of previous studies (105, 122). Two factors can explain the relationship between high age and strong SOC. High levels of SOC increase adaptation and survival, so that people who develop a strong SOC will stay well. However, this argument can be reversed in that this high age group represents the “survivors” (healthy people survive longer), who therefore have a high level of SOC. The first explanation seems most consistent with salutogenic thinking (12).

The observed relationship between SOC and socio-economic status, including economic and educational factors, has also been documented in other studies (123-125). In general, an individual’s level of education reflects his/her socio-economic status. However, previous findings have demonstrated an inverse relationship between SOC and education (55, 126). It should be noted that in samples of older people, many intellectually gifted individuals did not receive any higher education during their adolescence because of a lack of financial resources and traditional social and gender roles. Therefore, it is important that we do not underestimate the intellectual potential within groups with lower levels of education.

The relationships between SOC and various health dimensions (such as RIs, psychological distress, SRH, SHC, functional health, and perceived social support), and the use of health care resources are thoroughly discussed in the articles I-III. The results of the present investigation confirm previous findings that SOC corresponds strongly to psychological health, subjectively perceived health complaints, and perceived social support, and somewhat less to physical health conditions (127, 128). The cross-sectional design of this investigation does not allow us to determine the direction of causality. However, it must be remembered, particularly with regard to the subjective evaluation of health, that elderly people tend to judge their life situations positively despite a loss of health, possibly as a way of accepting their old age and its concomitant difficulties (129, 130). This may be explained through (a) the concept of “successful ageing”, which is associated with a more positive self-

perception (131); and (b) the fact that older people tend to adjust their expectations of life to their perceived physical, psychological, and social capacities. As these decrease over the years, the expectations of their performance decline accordingly (132). All these explanations may be a part of an individual's coping capacity insofar as being realistic is part of SOC (15).

7.2.2 Strong perception of social support predicted a longer period of independent living

Patients with a strong perception of social support managed independent living better than those who experienced weak social support. Therefore, it is reasonable to conclude that an initial strong perception of social support is a General Resistance Resource.

Perceived social support was strongest in women, and correlated with the frequency of visits/interactions with both family and friends in both sexes. This finding, together with the correlations between perceived social support and SOC, GHQ, and CDR, is consistent with the results of other studies (24, 133, 134). The relationship between the SPS and ADL performance was strong, which reveals the importance of being able to interact with social networks in order to perceive their support (135). Social relationships with family and friends/neighbours are important and increase an individual's sense of well-being (136).

An analysis of the subgroups on the SPS showed that social integration and nurturance correlated with the allocation of HNC, but that the effects of both disappeared in the equation, like SPS, when ADL were included in the model. This underlines the strong influence of functional capacity in older people. Social integration can be experienced when a person has access to a network, so that he/she can meet peers, exchange information, and share interests and concerns. One result of a lack of social relationships and little sense of community may be the experience of social isolation or loneliness. The opportunity to provide care is important if a person is to maintain a sense of nurturance, a feeling of being linked to other people, and that

other people benefit from one's actions or care. Lacking this sense of nurturance could entail a feeling of meaninglessness (21).

The fact that older people are particularly exposed to the loss of significant others and therefore must often live alone, with chronic illnesses, mobility problems, and a general loss of strength, makes them particularly vulnerable to feelings of loneliness (137). Furthermore, among older people, there seems to be a strong correlation between loneliness and the frequency of their contact with friends (138).

Weiss describe social support as an interactional process, in the sense that social support is achieved through various forms of mutual interaction between people. All people have a need for relationships, and only the experience of social support can prevent various forms of loneliness (21). This may explain the relationship between the SPS and functional capacity, insofar as a limited capacity to perform ADL may limit an individual's sources of social support.

We have no data demonstrating a causal relationship between social support and physical functioning. We based our analysis on the assumption that a decline in physical functioning can cause isolation or limit an individual's opportunities for social integration, and we assumed that this is a valid interpretation in our sample. This is consistent with several other investigations (24, 135). However, it is also important to notice that an initial low social participation has been reported to significantly influence an earlier onset of mobility decline, independent of initial functional capacity. This underlines the importance of being aware of the experience of social isolation in home living older persons (135).

A qualitative study reported an important interpretation of the origin of loneliness in community-dwelling older adults. Loneliness may occur with the disruption of meaningful engagement, together with age-related changes and losses. It seems that the loss of engagement in meaningful relationships entails a risk of feeling lonely.

Being engaged may repair disrupted connections, and therefore, engagement with others is a coping mechanism (139).

Interestingly, the SPS score did not correlate with bodily sensations or objective health measures, such as SHC, SRH, or RI. This may mean that if these conditions do not hinder social interactions they may not influence the perception of social support.

7.2.3 High self-rating of health predicted a longer period of independent living

Approximately 40% of the sample rated their health (SRH) to be good or very good. The association between age and SRH, as discussed in paper I, is consistent with the results of other studies (119, 140). A high SRH score is reported to predict the length of survival, and the oldest individuals may therefore report higher levels of SRH because they actually have better health than the general population of older people (141). The bivariate associations found in this study between age and fewer diseases, fewer SHC, and less psychological distress support this interpretation.

The patients' subjective evaluation of their own health (SRH) was a better predictor of future independent living than objective health measures, like RI. SRH was stronger influenced by subjectively perceived health sensations (SHC) than by objective health conditions, such as RI; thus, global perception of health (SRH) was more sensitive to the symptoms of diseases (SHC) than to the diseases themselves. It is worth noting that in this sample, SRH correlated with illnesses that can be seen as chronic, such as angina, cardiac insufficiency, and hypertension, and with illnesses that may cause pain, such as cancer and osteoporosis. Although RI correlated bivariate with SRH, this effect vanished when SHC were included in the model. Men were particularly vulnerable to psychological distress because they tended to convert physical illness into emotional distress. Coping, measured as SOC, influenced the relationship between SRH and health conditions (GHQ and SHC), but only in men, with a high level of SOC diminishing negative perceptions of GHQ on SHC.

As discussed in paper I, in a general cohort of very old people, the positive association between age and SRH can be explained by multi-morbidity, increased frailty, or a preoccupation with bodily sensations (47). Therefore, in general, the association between greater age and better SRH may be attributable to selective survivorship, as seen in this sample.

SRH may be interpreted as a vulnerability to illness (120). That the oldest individuals report better health may also be explained by the “disability paradox”, in which mechanisms such as “social comparison” influence how older people judge their opinions, abilities, and performance (142, 143). According to this theory, “downward social comparison” occurs when an individual compares him/herself with others who experience more difficult life situations, and “upward social comparison” involves comparison with those who are better off. Finally, a “temporal comparison” is made between the present situation and another situation or time in an individual’s life (57, 144, 145). Very old people tend to expect at least some health problems *at their advanced age* (performing a “downward comparison”), and therefore tend to evaluate their health as good, despite experiencing illness (they have a lower aspiration level). In contrast, those who are younger tend to evaluate their health against a background of higher aspirations, and despite equivalent objective health measures, judge their health to be poorer than do the oldest individuals (143).

7.2.4 Functional and cognitive decline and being male were the most important predictors of loss of independent living

In our study, low functioning on ADL and cognitive decline (CDR) shortened the period to NHA or death, together with being male, perceived low social support, and poor SRH. The two latter conditions are discussed in the previous sections. Our findings correspond, to a large extent, to those of other investigations (2).

In particular, poor functional health (ADL functioning) and cognitive impairment seem to be important conditions threatening an individual’s capacity for independent living (1, 146, 147) and, as expected, people with multiple functional deficits are particularly vulnerable (146).

The only bivariate correlation that vanished when the complete model was tested was the influence of GHQ. In paper III, we argue that psychological distress as a predictor of institutionalization should be excluded with caution, basically for methodological reasons, because subjects with psychological distress may have declined to participate during the selection of the study sample.

An interesting finding was that poor perceived social support directly influenced NHA, even when controlling for the effects of other variables. This underlines the importance of perceived social support in a person's capacity to meet the challenges of daily living.

7.2.5 Compensatory or complementary assistance from informal networks did not influence the period of independent living

Children and grandchildren contributed most of the informal assistance received by the elderly. This was also demonstrated in another study of this sample population (148). In this sample, spouses contributed less assistance than children (accounting for the fact that most participants were widowed), probably because the mean age was high, inevitably reducing their ability to offer such assistance. Because informal care offered by spouses and next of kin constitutes important assistance in allowing an elderly person to stay at home (149), the relatively high proportions of widowed participants and those living alone increase the overall vulnerability of home-living care recipients.

The majority of patients frequently saw family members and friends. However, there were no differences in frequencies of visits to elderly people living in their own homes and those living in sheltered accommodation.

The patterns of compensatory and complementary assistance provided by family members in this sample are consistent with those observed in other investigations (150, 151). The help given by kin was basically complementary to the HNC, in that

the family assisted with tasks of less “intimate” character (leaving tasks related to bodily care/nudity to the home nurses) (148). When public services provide satisfactory amounts of assistance to meet caring needs, the family members may concentrate largely on tasks they regard as supplementary, such as assistance with the instrumental ADL. In this sample, these were tasks generally associated with the home help profession (148). It has been demonstrated that considerable access to informal care may reduce the amount of formal care supplied (152), although in most cases, most care recipients prefer formal to informal care. In fact, good access to formal help has been shown to stimulate the amount of informal help given (153). However, the amount of family care provided is rather stable, including in Scandinavian countries, even when the amount of formal care is extensive (151).

7.2.6 The allocation of home nursing care was mainly influenced by impaired functional health

Because a major purpose of this thesis was to investigate the enabling factors in the lives of home-living care recipients, it was of particular interest to determine how nurses assessed the needs of these patients. We assumed that they would implement nursing activities that would compensate for the self-care deficits of the patients, and would improve the patient’s well-being or quality of life, thus improving his/her ability to live in his/her own home for as long as desired.

By far the most important factor in the allocation of home care was physical disability (ADL). Impaired physical functioning leads to dependence (38), subsequently limiting the individual’s social contacts, entraining loneliness (154). Physical functioning is an obvious skill required for mobility and self-care, and is therefore a precondition for coping with daily life in the home. We found that all the topics covered by the ADL scale correlated with HNC, except bowel problems. When ADL functioning is compromised, the likelihood to stay at home is inevitably threatened. This is probably a major reason why nurses recognize and prioritize the need for physical assistance. However, physical impairment, which can be measured and registered objectively, is another factor that should be mentioned.

In the Scandinavian welfare model, where the allocation of health services by definition is based on the right to services, regardless of social status and income, it was surprising that the difference between high and low education levels influenced the amount of HNC allocated. Possible explanations could include that patients with higher education are more informed and demanding with regard to their conditions and rights (155), and in many cases have also their children higher education, and thus being more demanding on behalf of their parents. Another cause may be that children of highly educated parents more often move to other cities to take up jobs appropriate to their education, and thus are less able to assist their care-dependent parents. Our findings indicate that older care-dependent individuals with low social support and a low level of education are a particularly vulnerable group.

Based on the current plans for Norwegian health care, we expected that emotional conditions, including loneliness, which are vital components of quality of life, would be independent reasons for the allocation of HNC (5). This was not the case. There was a significant bivariate correlation between social support and the frequency of HNC, but this relationship was caused by an underlying effect of ADL on perceived social support.

The influence of subjective perception of own health is well recognized, but despite known emotional complications of cognitive impairment, these conditions did not directly influence the amount of HNC received. This indicates that nurses have to give priority to bodily care, predominantly necessitated by the decline in various ADL (44). Several aspects may be noted. Nurses (and doctors) obviously struggle with being able to attend to the comprehensive needs of the patient, having to lower the standards and narrowing their roles, which implies that only vital needs can be undertaken (156). These findings are supported by Tønnessen et.al. (157); psychosocial and spiritual needs are not considered as part of home nursing services. Personalization of care must be adapted to the administrative and financial framework that applies (158). New models of home care administration, where decision-making with regard to assess care needs and allocation of care is centralized

(the purchaser-provider organization) could explain some of the priorities between subjective and objective health complaints. The dynamic and close relations between nurses and the patients, where subjective needs more easily would be exposed, is replaced by a centralized allocation, where objective goals influenced by the ideas of quality management, guaranteed standards of service and contractual arrangements are prominent reasons for allocation of care (159).

7.2.7 Reported illness did not affect allocation of home nursing care

We found no association between neither the total number of diseases, nor particular diagnoses, and the allocation of home care. Depending on assessment methodology, this is consistent with many previous studies (2, 160) and is attributable to several factors. First, (self-reported) diseases may vary in severity, and an ICD-10-diagnosis is often insufficient to assess the severity of a disease. For example, heart failure may vary considerably in severity. Second, it is also clear that suffering from a disease for a long period does not necessarily cause a decline in physical functioning, but may, in certain periods, cause considerable functional problems. Therefore, although a relationship could be expected between comorbidity and care needs, the considerations discussed above may also be applied in this context.

Older people receiving HNC were functionally incapacitated by both morbidity/comorbidity and the general ageing related impairment. On the other hand, self-reported diagnoses did not correlate with a loss of functional capacity (ADL), institutionalization (NHA), or the amount of HNC received, but did correlate with SHC and SRH. This indicates that diagnosed illnesses in itself say little about functional incapacity because this largely depends on the severity of the disease.

7.2.8 The home nursing care patient

7.2.8.1 Socio-demographic characteristics and background variables

This sample consisted of a group of elderly patients, most of whom were women, and the vast majority of whom lived alone. There were few other sex-based differences in the sample. About two thirds of the participants lived at home, and the others lived in sheltered housing. On average, the respondents reported a fairly good economic status.

The mean age of the study population was relatively high (84 years), and the distribution of age probably reflects the average age composition of a Norwegian sample of older care recipients, aged 75 years or more.

The proportion of women in the sample was 70.7%. In the general population, the proportion of women aged 80-89 years is approximately 65%, and the proportion aged 90 or more is approximately 72% (161). The advanced high mean age explains the high rate of widowed patients (68%). The proportion of those living alone (75%) was slightly higher than those who were “not married” (73%) (no specific statistics on people “living alone” exist) in the general Norwegian population of people aged 80 years or more (6). Although the proportion of individuals living alone was somewhat higher among women (78%) than among men (67%), the difference was not significant.

Approximately one third of both women and men lived in sheltered housing, probably reflecting the emphasis in the 1990s on building accommodation to reduce the need for institutions. Only 16% of the sample reported that they could not afford to spend money on something extra, reflecting the relatively good economic status of the oldest old. This sample consisted of people born around 1910-1925, and the relatively low percentage of highly educated people reflects the limited opportunities for higher education in that cohort. Less than 6% of the patients had a college or university degree.

7.2.8.2 The oldest patients were the healthiest

Self-reported numbers of diseases (RIs), numbers of SHC, psychological distress (GHQ), SRH, and SOC correlated with increasing age (Figure 3). These findings are important because they reveal important characteristics of a sample of home nursing patients.

A reasonable explanation of why the oldest participants in this sample were healthier could be that many care-dependent members of the oldest group of the elderly cohort were already institutionalized, and that those continued living in their own home were the healthiest of the high-age group. This implies that individuals who were, injured, ill or care dependent early in their old age, but were still living in their own homes, were present in the group of youngest patients (75-84 years).

These findings also reveal that the allocation of HNC differed somewhat among the oldest old. Significantly more diseases and the discomfort associated with diseases (more SHC, poorer perceived health, and more psychological distress) were registered in the youngest group (75-84 years) than in the oldest group (85-97 years). However, difficulties in performing ADL did not differ between the two groups. This could indicate that in the youngest group, the reduced ADL level was mainly caused by illness (comorbidity), whereas in the oldest group, problems with performing ADL were more often related to vulnerabilities and age related functional decline.

7.2.8.3 Objective health

Diseases

On average, each patient reported three diseases. This corresponds to the results of comparable samples in Swedish communities (162), but is lower than the average of five diseases reported in the Newcastle 85+ cohort study (163). The method of identifying diseases probably influences the numbers identified. In the present study, as in the Swedish study, self-reports of diseases were used, whereas in the English

study, thorough assessments of health were made by general practitioners. Women reported more diseases than men, which is consistent with other findings (164, 165).

7.2.8.4 Subjective health

Subjective health complaints in HNC patients

In the present sample, SHC were more frequent in women and in the youngest group of respondents. This seems understandable because women reported more RIs than men, and SHC correlated with most of the illnesses included in the variable RI.

Elderly care-dependent individuals often experience a complex life situation, with somatic, mental, and social changes, while adapting to the ageing process. This was observed in the present study, in which SHC correlated with all the other indices measuring both objective and subjective health, except the clinical dementia rating. However, subjective health complaints did not influence the loss of independent living or the amount of care allocated. Therefore, this scale seems to capture afflictions with which the individual manages to cope with no severe functional consequences.

The health concerns of an individual are not always caused by a present disease, but rather by subjective feelings of wellness or distress. This experience, designated SHC, is what older people generally refer to when talking about their “health” (166). SHC measures the occurrence and severity of somatic and psychological complaints (81, 167), and is particularly sensitive to health complaints with minimal or no clinical symptoms (168).

7.2.8.5 Psychological health

Psychological distress (GHQ)

High levels of psychological distress, measured with the GHQ-30, correlated with a higher education, belonging to the youngest group, low SRH, weak SOC, many SHC,

and poor ADL functioning. There were no sex-based differences and no associations with RIs or cognitive impairment (CDR).

Female sex, cognitive impairment, somatic illness, decline in ADL functioning, loss of social contacts, and a history of depression are commonly reported risk factors for psychological distress among old people (115, 169). In recent years, attention has also been directed towards the influence of personal resources, such as a positive outlook on life, as important factors affecting psychological distress (170, 171).

In the present study, several of the above mentioned risk factors, were not related to psychological distress. Possible reasons for these discrepancies are a greater acceptance of bodily and functional shortcomings and of changes related to goal achievement in old age, consistent with the model of selective optimization with compensation (172).

8.0 Implications for practice

The findings from this study reveal important knowledge about the home nursing care patient that should be implemented in every-day practice. The relevance is further strengthened through the salutogenic approach of the study. This means that it is important to understand mechanisms that might improve health, quality of life, and eventually, the ability to live independently. In this regard it is important that nurses are able to identify health problems and social resources in order to implement coping measures. In this thesis a “vulnerable patient” has been defined as a person suffering from health and functional deficits, including subjective health problems, and finally had to give up independent living.

We identified several causes for institutional care. Poor functional health (ADL), poor cognitive capacity (CDR), a low self-rating of health (SRH), poor perceived social support (SPS), and being male. Of these threats, only ADL function was identified by the nurses as a condition that was assigned HNC. Furthermore, we found that self-rating of health (SRH) was an independent predictor of nursing home admission. This is important, since SRH was connected both to subjective health complaints (SHC) and coping (SOC), and mediated the influence of registered illness (RI), and thus may influence a person’s perceived quality of life. This reveals a pattern; subjective health seems to be overlooked when nurses evaluates needs for care.

Nurses should emphasize the identification and treatment of subjective health problems.

Our findings underline the importance of including subjective dimensions as part of the clinical assessment of older HNC-patients, because both poor self-rating of health and poor perceived social support influenced their ability to live independently. Recent intervention studies can be divided into four main types: (a) enhancement of social skills; (b) provision of social support; (c) supporting possibilities for social

interaction; and (d) addressing maladaptive social cognition (34). In most cases, such interventions have shown positive outcomes, underlining that nurses do have various tools at hand in order to improve the perception of social support. The distinction between Weiss's concepts of social and emotional loneliness (21) should be taken into account in caring for older people. It is probable that people experiencing emotional loneliness need different types of interventions from those required by people experiencing social loneliness (24).

The association between self-rating of health (SRH) and subjective health complaints (SHC) underlines that subjective perception of health incorporates major parts of life, and the importance of including these when assessing care needs.

The salutogenic approach should be given stronger attention as a principle for nursing practice.

It is important that the community creates services that strengthen the coping resources of elderly people (127). Our results show that SOC associated with almost all variables included in the study, strongly with subjective health measures and moderately with objective measures. This implies that the principles constituting the SOC concept should be taken into account in both caring for the individual (with her personal resistance resources) as well as the services, living facilities and social network (external resistance resources). The concepts of SOC; meaningfulness, manageability and comprehensibility, has shown to be influenced not only negatively from diseases or negative life events, but also positively from measures aiming to strengthen peoples coping abilities (12, 15).

9.0 Implications for further research

The overwhelming emphasis on objective health indicators when assessing and implementing care needs shows that there is a great need for further research on how subjective health problems may be identified and used as foundation for HNC interventions.

The main problem may be the lack of existing assessment scales, leaving the judgement of the results to a subjective evaluation of the nurses.

Our investigation reveals that social provisions and self-rating of health are crucial with regard to independent living, and along with measuring subjective health complaints (SHC) and psychological distress (GHQ), all these dimensions influences quality of life, also regarded as a priority of Norwegian HNC.

Continued research into loneliness is required to establish an understanding of the treatments that can improve both the quality of life and functioning of older people (24). Most interventions have focused on treatment with social types of interventions, but further research should differentiate between the dimensions of emotional and social loneliness because this distinction may allow the appropriate intervention to be more easily identified (24).

Except of SRH, more handy instruments should be developed in order to document the subjective health conditions. However, since the presence of subjective health complaints in many cases should be easy to identify, the problem may not be a lack of diagnostic tools alone, but rather a lack attention among the nursing staff. This should be further investigated through qualitative studies among registered nurses.

More research should be done with regard to how the dimensions of sense of coherence influence health promotion. This includes both the individual patient, and

how services are organized. The treatment of care-dependent older individuals based on a salutogenic perspective is important in terms of strengthening the coping resources of the patients (127). This means that measures must be taken to strengthen each individual's capacity to experience meaningfulness, comprehensibility, and manageability. These dimensions may be influenced through interventions, both directly in the nurse-patient relationship, but also indirectly, through the organizing of the services.

10.0 General conclusions

The influence of Sense of Coherence:

- Coping resources, measured as Sense of Coherence (SOC), did not prolong independent living.
- Sense of Coherence did not influence the amount of home nursing care allocated.
- Sense of coherence diminished negative perceptions of psychological distress (GHQ) on self-rating of health (SRH), but only in men.
- Sense of Coherence was in particular strongly associated with subjective health conditions, in addition to moderate but significant correlations to objective health measures and social background variables, showing that SOC are connected to an overall sense of quality of life.

Independent living versus institutionalization:

- Functional health (ADL) predicted decreased the ability for future independent living.
- A poor perception of social provisions (SPS) decreased the ability for future independent living.
- A low self-rating of health (SRH) decreased the ability for future independent living.
- Initial cognitive impairment decreased the ability for future independent living.
- Men were more vulnerable with regard to independent living than women.
- Informal assistance did not influence the future period of time of independent living.
- Decline in ADL-functioning (caused by illness, ageing or social processes), is a better indicator for vulnerability to institutionalization than medical diagnoses.

Allocation of Home Nursing Care:

- ADL-functioning was the main cause of allocation of HNC.
- Lack of social support (SPS) did not influence the amount of HNC allocated.

- Lack of perceived social support affected the amount of HNC only when feelings of loneliness were connected with poor ADL-functioning.
- Self-rated health was not associated with the allocation of HNC.
- Level of education associated positively with the amount of HNC.
- Allocation of HNC was not influenced by subjective health measures, like SRH, GHQ or SHC.
- Being cognitively impaired did not influence the amount of HNC.

The vulnerable HNC-patient:

- Self-rated health (SRH) was more associated with subjectively perceived health (SHC) than objective health measures (RI and ADL).
- The relationship between the SPS and ADL performance was strong.
- Older care-dependent individuals with low social support and a low level of education were a particularly vulnerable group.
- The oldest old in the sample (85+) were the healthiest. Significantly more diseases and discomfort from diseases were found in the youngest group (75-84).
- Subjective health complaints were more frequent in women than in men.
- Older persons with a general poor perception of subjective social and health conditions are vulnerable since these are not intercepted as a reason for care assistance.

Source of data

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