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PREVENTIVE HOME VISITS FOR 75-YEAR-OLD PERSONS BY THE DISTRICT NURSE

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”Om jag vill lyckas med att föra en människa mot ett bestämt mål måste jag först finna henne där hon är och börja just där: Den som inte kan det lurar sig själv när hon tror att hon kan hjälpa andra”

Kierkegaard

ABSTRACT

Background: Action plans are needed to promote health and to prevent diseases amongst older persons so that they can remain with good health in their homes for as long as possible. One method which has been tried in many countries is preventive home visits. In Sweden, the Executive Board of County Council of Stockholm decided to implement such visits for 75-year-old persons by the district nurse (DN). However there were questions about how to structure these preventive home visits so that they should benefit older persons' health and health conditions.
General aim: The general aims of this thesis were to describe 75-year old person's self-reported health and health conditions and to analyse the changes and effects on their health after a preventive home visit by the DN.
Method: In *study 1,* the 75-year-old person's self-reported health conditions were described (n=583). In *study II,* eight health care centres (HCCs) were randomised into a study group (SG) and eight HCCs were randomised into a control group (CG). The 75-year-old persons who were registered at these HCCs, SG (n=176) and CG (n=262) filled in a questionnaire in 2006 and 2007. The SG received a preventive home visit by the DNs and the CG was treated as usual. The 75-year-old person's self-reported health conditions, knowledge about the county council and local community and use of medication were analysed.
Result: Most 75-year-old persons reported their health as good or very good, but they also reported health problems such as: pain, sleeping, memory failure, fatigue, poor understanding of their own health and illnesses, elimination patterns, underweight and overweight. Those living alone, those with elementary school education and women reported worse health and well-being than other groups *(study I).* At follow-up both the SG and the CG reported a decrease in health and well-being and an increase in medication. However, within the SG, health and well-being were stable regarding pain, vertigo, fatigue and mobility compared with the CG. The SG also increased their knowledge regarding the local community and county council facilities. The CG reported significantly more health problems in the category of activity in daily life. A majority, 84%, of the 75-year-old persons reported that the preventive home visit was useful *(study II).*
Conclusion: The 75-year-old persons experienced good or very good health and well-being at the same time as they self-reported many health problems. The study contributes to the knowledge about health issues that concern persons of this age group and what the DN should be aware of when performing preventive home visits. It also suggests how to educate DNs regarding such visits *(study I).* Preventive home visits following a predetermined structure might identify health problems (of which some of the 75-year-old persons wanted help with), like ADL, pain, vertigo, fatigue, mobility as these health issues were stable in the SG compared to the CG. However it did not have any effect on health behaviour or reduced the use of medication but it increased knowledge about the services and resources offered by the local county council and local community. Both health promotion and disease prevention strategies are necessary when working with preventive home visits as many participants were healthy at the same time as they had many health problems. The preventive home visit was seen as useful by a majority of the 75-year-old persons and made them to feel secure *(study II).*

Keywords: 75-year-old persons, district nurse, health condition, health and well-being, preventive home visit, sense of coherence

CONTENTS

LIST OF PUBLICATIONS

This thesis is based on following papers:

Sherman H, Forsberg C, Karp A and Törnkvist L
The 75-year-old persons' self-reported health conditions: a knowledge base in the field of preventive home visits.
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Sherman H, Forsberg C, Karp A, Söderhielm Blid S and Törnkvist L
Changes and effects on the 75-year-old persons' health after a preventive home visit by district nurses: a longitudinal controlled trial.

ABBREVIATIONS

ADL	Activity in Daily Life
ANCOVA	Analyses of Covariance
BMI	Body Mass Index
CeFAM	Centre for Family Medicine
COPD	Chronic Obstructive Pulmonary Disease
DN	District Nurse
HCC	Health Care Centres
HI	Health Index
IADL	Instrumental Activities of Daily Living
NORA	Nordic Research on Aging
PHC	Primary Health Care
RCT	Randomised Controlled Trial
RN	Registered Nurse
SENICA	Survey in Europe on Nutrition and the Elderly, a Concerted Action
SOC	Sense of Coherence
SPSS	Statistical Package for the Social Sciences
VIPS	W(V)ell-being, Integrity, Prevention and Safety
WHO	World Health Organisation

INTRODUCTION

Two topics, disease prevention and health promotion, were the inspiration for this thesis. In my work as a district nurse (DN), I have met many patients, young and old, with health problems and diseases that could have been prevented if they had been detected and cared for at an earlier stage. I have also worked with health promotion, i.e. encouraging people to maintain or improve their health through support and education.

District nursing practice in primary health care settings includes health, environment, interaction with human beings and nursing care. These four concepts of consensus give a good summary, and description, of a DN's work. He/she provides nursing care for individuals and families living at home in the local community.

In 2005, the Centre for Family Medicine (CeFAM), in cooperation with *Stiftelsen Äldrecentrum* (Stockholm Gerontology Research Center Foundation), was commissioned by the Stockholm Executive Board of the County Council to study 75-year-old persons' self-reported health and health conditions and to analyse the changes and effects on their health after a preventive home visits by the DN.

BACKGROUND

DEMOGRAPHIC DATA

In all Western countries older persons belong to an age group which is growing rapidly and Sweden is no exception [1]. The proportion of the Swedish population and the percentage of persons over the age of 65 have increased by approximately 50% since 1950. This growth will continue both with regard to number and percentage. Today life expectancy in Sweden is about 79.3 years for men and 83.5 years for women. Up until around 2020 the younger group of pensioners, between 65 and 75 years, will represent the largest group in percentage. There are 1.6 million persons older than 65 which is 18 percent of the Swedish population. By the year 2060 the number is calculated to be 2.7 million or 25 percent of the population [2].

THE OLDER PERSON

Aging

Old age is a part of the life course and has to be viewed from a holistic perspective, including psychological, biological, social and environmental aspects. Normal aging is individual and characterised by progressive and irreversible changes in structure and function [3, 4], changes sometimes very difficult to separate from various illnesses and diseases [5]. Furthermore many of these changes are the results of a combination of possible influences of genetics, early life factors and environmental risks and health behaviour in mid- and later life. Psychologically it has been suggested that a person's personality influences his or her adjustment to aging. It would seem that older persons who have intact cognitive abilities preserve their personality and adjust better to aging and old age [6]. Other important factors are the person's experience of life events and the ability to cope with stress. This may explain why some persons cope better than others [7].

Definition of aging

The World Health Organisation (WHO) uses a chronological concept of age, i.e. the length of time that a person has lived, defining individuals between the age of 60 and 74 years as elderly, those between 75 and 89 as old and those aged 90 years and above as very old [8]. In Sweden a person 65 years and older is often referred to as old due to the retirement standard [9]. Neugarten (1974) was the first to draw the distinction between the young old ($\geq$ 65 and 75 years) and the old olds ($\geq$75 and older) [10]. However the chronological age used to define old age is illogical with regards to an older person's health and well-being and varies both culturally and historically. During recent decades aging has been viewed from a life-course perspective using the concepts of the third and fourth ages. The third age is seen as a time of opportunities and activities whereas the fourth age is defined as the final time and dependency [11].

Older persons' health conditions

In Sweden as in many Western countries older persons' health and well-being are good, and a majority of citizens have a healthy lifestyle as seen from a health promotion perspective [1]. However health problems increase with age and are unequally distributed [12]. Older persons with low socio-economic status or belonging to ethnic minorities may find access to health services difficult. It is known that many diseases in later life are preventable, and health promotion might help ensure that older persons with chronic conditions and disabilities continue living an active and independent life [1] if the problems can be identified and cared for at an early stage [5, 13]. In Stockholm around 5% in the age group 65–74 have walking difficulties, which increases to 33% for persons aged 75–84. With age the need for technical support such as a walking cane or a wheelchair increases [14]. Falls are both an individual and public health concern because of their frequency and adverse consequences in terms of morbidity, mortality and quality of life, as well as their impact on health system services and costs. In older females in particular, falls are the leading cause behind the burden of disease [15]. In Stockholm almost 50% who had problems with some form of cardiovascular disorders. The dominant form of treatment (42%) was medication [14]. Chronic obstructive pulmonary disease (COPD) is a common health problem. After the age of 50 the prevalence of COPD increases considerably, particularly among smokers of which 45% develop the disease [16]. Current demographic changes will result in a further substantial increase of chronic obstructive airway disorders [17]. A study by Stenelius (2005) showed that 39% reported problems involving incontinence in a group of persons aged 75 and older. The problem was more common amongst women than men. The persons with incontinence also had more other health complaints compared with persons without incontinence [18]. Chronic pain appears to be common amongst people aged 65 and older. The prevalence estimates range from 20–50% to 58–70% of community-dwelling older adults. Pain, which is more common amongst women than men, has an impact on activities of daily living [19]. Considerable gains in terms of better health and well-being could be achieved if older persons adopted a healthier lifestyle with regards to their eating habits. Nutrition problems are common with regards to older persons [20]. According to a public survey on weight 14% of the age group of 65–69-year-olds were considered obese, while 4% were underweight. In the age group 80–84 the proportions were reversed, barely 9% were overweight and 10% were underweight, of which the majority were women [14]. Fatigue, which is more common in women than men, can be an early symptom of disease and also predicts future care in older persons [21]. In a survey conducted by the National Institute of Aging in America, 42% had sleeping difficulties [22]. The major sleep complaints among older adults include difficulty initiating and maintaining sleep, excessive daytime sleepiness, waking feeling unrested, waking too early, or frequent nocturnal waking [23]. The aging process brings an increasing risk of mental illness. In Stockholm about 10–15% of older persons have depressive symptoms and five percent suffer from very severe depression [14]. The prevalence in comparison with the rest of Europe is about the same [24]. Another risk that comes with increased age is dementia. The incidence is very low before 60 years, while about 45 percent between 95 years of age and over have a dementia disease [25].

From the 1960s onwards many studies about older peoples health in general have been performed both nationally and internationally, e.g. the H-70 study [26, 27] and the Kungsholmen project in Sweden [28], Nordic Research on Ageing [NORA] [29, 30] and the Survey in Europe on Nutrition and the Elderly, a Concerted Action [SENECA] [30, 31]. Many of these were longitudinal population-based studies or studies about specific health problems such as pain [32] or dementia [25, 33]. Additionally many textbooks regarding older people's health have been published, e.g. [3, 4, 12, 34, 35] aiming at older persons health in general.

CONCEPTS OF HEALTH

Health

The most commonly referred to definition of health is the 1946 one from WHO, which states that health is 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' [36]. Since then the definition has been modified many times and is now increasingly directed towards health and well-being and a person's perspective of quality of life [8, 37]. Quite often health is viewed from a biological perspective, meaning that health is the absence of diseases [38]. However in most cases the meaning of health is more than just the absence of diseases and is thus described from a holistic approach expressing the human being as consisting of a body, soul and spirit [39]. Health can also be expressed as a resource-oriented perspective in which every person realises his/her own potential goals for everyday life; health is not only the objective of living [8]. An additional way of describing health is using the concept of sense of coherence (SOC). SOC is based on the theory of salutogenesis, describing what keeps people healthy instead of what makes them ill (pathogenesis) [40]. Antonovsky suggests that, as long as we live, we all experience health to some degree by moving between the two extremes of 'eases' and 'dis-eases' on the health continuum. The SOC model consists of three related dimensions comprehensibility, manageability and meaningfulness. Together they express a global orientation of which extent an individual experiences the world as structured, predictable and understandable [40]. Health is a basic concept in nursing that defines nursing assessments, plans for interventions and/or in evaluating nursing outcomes [41]. It also involves how nurses view human beings during the course of their illnesses, as well as when they attempt to maintain or promote their health [42]. During the 1970s and 1980s, four major concepts in the domain of nursing were identified as health, human being, environment and nursing [41-43], although there are variations in the recommendations of metatheorists regarding what, how many and which concepts should be included when describing nursing [42].

To identify health problems and to support and promote health, nurses can use the nursing process. The nursing process is defined as a problem-solving method based on principles of scientific methodology and a way of theorising nurses' work. The VIPS documentation model is based on the nursing process. VIPS, which is the Swedish acronym for 'Well-being, Integrity, Prevention and Safety' [44, 45], is used in both hospitals [46] and primary health care settings [47]. These concepts can be seen as indicators of the outcome of health care [48].

Health promotion

The first international conference on health promotion was held in Ottawa, Canada in 1986. It widened the debate about health promotion by highlighting a population approach that said that health promotion is the process of enabling people to take control over and improve their health. It was also described as a combination of policy-making linking diverse but complementary approaches, including legislation, fiscal measures, taxation and organisational change [49]. A statement in the Munich Declaration pointed out that nurses and midwives working in primary health care settings in particular had to increase their health promotion work in the municipality [50]. Today it is known that 80% of the burden of disease in Europe comes from non-communicable diseases [51]. This has drawn attention away from the dominance of the medical model in primary health towards a more promotive one. In Sweden health promotive strategies are now being developed, with the country being the first in the world with guidelines to follow regarding health behaviour work by DNs and other health professionals [52]. Health promotive strategies can be divided into different areas such as health information and empowerment [53], health behavioural change [54, 55] and health education [56] and programmes to improve the capacities of individuals [54, 57].

Disease prevention

Disease prevention refers to measures taken to prevent ill-health by identifying risk factors, early discovery of diseases and rehabilitation [58] and is divided into three categories:

Primary prevention means avoiding disease from occurring in individuals or populations at risk. Some of the conditions caused by unhealthy health behaviour could be adjusted if people were aware of them and if they received professional support [59].

Secondary prevention means finding early (asymptomatic) stages of the illnesses before they become a manifest disease. One way of doing this is through screening programmes which have become a major part of the daily work in primary health care settings. Examples of secondary prevention are identifying persons with high blood pressure, high blood sugar and memory failure. To identify persons in an early stage of illness is beneficial for the individuals as well as for the society [38].

Tertiary prevention means designing interventions that limit human incapacity and prevent or postpone morbidity and mortality, once the disease is already clinically manifested [60].

Self-reported health

Self-reported health, based on how a person perceives his or her health and illnesses, has been found to be an important determinant of health and predictor of future care [61, 62]. By capturing subjective aspects that are difficult to obtain with other objective measurements a holistic picture of an older person's health situation can be acquired [63]. There are many ways of measuring a person's self-reported health. One is using

the Health Index Questionnaire (HI) [64, 65] and another is to ask the persons to report their health condition with a starting point in the VIPS documentation model mentioned above, to capture health problems or to support health [44]. Two other commonly used questionnaires in evaluating a person's health are SF-36 [66, 67] and EQ 5-D [68, 69]. SF-36 is a so-called profile measurement while the EQ 5-D is so-called preference based. This means that the SF-36 generates a description of health status in the form of a health profile with index values for eight different aspects of health. EQ 5-D generates two horizontal index values: quality of life and a self-evaluation of health. A main development in recent decades is that measurement of health has shifted from caregivers' perception towards the person's subjective perception of his or her own health [70].

PRIMARY HEALTH CARE SECTOR

The primary health care sector plays an important role in health promotion and disease prevention as it reaches most citizens in the local society. The aims of the primary health sector are to improve the general health of people of all ages and to provide medical treatment, rehabilitation, nursing and caring that do not require hospital-based medical and/or technical specialised care. The aim is also to work with health promotion as well as disease prevention. It is this level of the health care system that people should turn to first with their health problems. The primary health care approach encompasses high quality evidence based care, good accessibility, equal rights to health care service and community involvement/participation [71].

In Sweden the primary health care system is organised in 20 county councils and 290 municipalities. Each county council can decide how to deliver medical and nursing care. The most common way to run the primary health is through a Health Care Centre (HCC) where general practitioners (GPs), DNs, enrolled nurses, physiotherapists and occupational therapists work.

THE DISTRICT NURSE PROFESSION

The Swedish DN is often seen as a general specialist as the profession is complex and contains many components. The profession gives the DN the competence to work with a broad range of activities, from health promotion regarding newly born babies to palliative care for patients living at home. He/she works along a continuum of human beings (patients) to population-based interventions for bio-psycho-social health across demographic groups in the local community. The responsibility includes the obligation to deliver high-quality, safe and effective nursing care [72] using a holistic approach [73]. Many DNs work at HCCs, inter-professionally together with family doctors and other health care professionals that are participating in shared patient care. Over the last 30 years society has changed as there has been a demographic transition towards an older population [2]. More and more of the DNs' time is spent caring for older persons as a result of the change in the population structure and the reduction of hospital wards [74]. The DN has a leading role and is the manager of a team of registered nurses/support workers delivering care to patients in their homes [75]. Apart from

home visits the DN receives patients at the HCC. Besides providing direct patient care, DN has a teaching role, helps enable people to care for themselves and their family members and draws up programmes of evidence-based nursing care interventions for patients that have been referred to them. After specialisation, which entails 50 weeks of full-time studies after a bachelor degree in nursing, the DN has the right to prescribe aids for patients with incontinence and diabetes, technical aids to facilitate daily living [76] and certain medications [77].

PREVENTIVE HOME VISITS, CONCEPT AND STRUCTURE

The concept of preventive home visits

Preventive home visits to older persons is a concept that describes health promotion activities for older people. The aim of these preventive home visits is to promote health, prevent disease and/or try to delay the onset of impairment [78, 79]. The concepts describing these health promotion activities vary and are called variously preventive home visits, in-home visits, in-home health/geriatric assessment [80, 81] preventive programme for community-dwelling elderly [82-84], in-home interventions [85] and health coaching [86]. Sometimes they are just studies that describe assessment tools [87] or are described using a combination of assessment tools, intervention and home visits [88]. The broad environmental context, the substantial variation in the format of care, the varying involvement of health-care professionals and different programme intensities make it difficult to compare different preventive home visiting activities effects on older persons' health with each other [89-95]. In the literature four groups are targeted for preventive home visits:

1. Preventive home visits aimed at older persons living at home without any selection [78, 83, 96, 97]
2. Preventive home visits aimed at older frail persons living at home [84, 98]
3. Preventive home visits aimed at older persons living at home and targeting specific health problems like mental health problems [85], preventing falls [99, 100], readmission to hospital [86, 101, 102] or persons living alone [103]
4. A combination of preventive home visits and/or group sessions aimed at older persons living at home. Interdisciplinary teams working together [88, 104]

Systematic reviews

Since 2000 three systematic reviews [90, 105, 106] and six reviews and meta-analyses [89, 91, 93, 107-109] have been carried out, along with one integrative research review [92] and one literature review [94] that attempt to answer the question of the effectiveness of preventive home visits, see table 1.

Table 1. An overview of reviews regarding preventive home visits and the number of studies used in the reviews.

Author	Year	No.	Title	Study design	Studies in the reviews
Beswick	2008	[89]	Complex interventions to improve physical function and maintain independent living in elderly people	systematic review and meta-analysis	37
Byles	2000	[90]	A thorough going over: evidence for health assessments for older persons	Review	17
Bouman	2008	[105]	Effects on health care use and associated cost of a home visiting program for older people with poor health status	Review	8
Elkan et al.	2001	[91]	Effectiveness of home based support for older people	Review and meta-nalysis	15
Fagerström et al.	2008	[110]	An integrative research review of preventive home visits among older people – is an individual health resource perspective a vision or a reality?	Review	18
v Haagstregt	2000	[107]	Effects of preventive home visits to elderly people living in the community	Review and meta-nalysis	15
Huss	2008	[93]	Multidimensional preventive home visit programs for community-dwelling older adults	Review and meta-nalysis	21
Markle-Reid	2006	[94]	The effectiveness and efficiency of home-based nursing health promotion for older people	Review of the literature	12
Ploeg et al.	2005	[108]	Effectiveness of preventive primary care outreach interventions aimed at older people	Meta-analysis	19
Stuck et al.	2002	[83]	Home visits to prevent nursing home admission and functional decline in elderly people	Review and meta-analysis	18
Stuck et al.	2008	[106]	Whom do preventive home visits help?	Review	5

The results of these reviews showed that preventive home visits can have favourable effects on outcomes for older persons in terms of improving functional status [92-94, 109], increasing quality of life [90, 92], reducing hospital admission [91-94, 108, 109], reducing the use of health and social services [94], preventing falls [89], reducing costs [94, 109] and reducing mortality [91-94, 108, 109]. However some reviews showed that preventive home visits have no effect [105, 107].

Models of preventive home visits

Many of these reviews included the same studies. The four most common studies included in the reviews were a study from Holland (1993), the Roedovre project in Denmark (1980), a study from South Wales (1992) and a study from California (1995). Also presented is a study from Netherlands (2000) based on the nursing process and a study carried out in Sweden (2006). Additionally two studies that describe a combination of preventive home visits and/or group sessions where professions were working interprofessionally are presented, one from Germany (2011) and one from Sweden (2012).

The most common study included in 10 out of 11 reviews was the study carried out in Holland by van Rossum (1993). In this study the same nurse was visiting older persons between the age of 75 and 84 years four times a year over a period of three years with extra visits if necessary. The visits lasted from 45 to 60 minutes. During the visits no physical examinations were performed. The nurses discussed health topics in a broad sense with the older person and gave information and advice. To standardise the intervention the nurses used a checklist containing questions on, for instance, functional state, medication, social contacts, and housing conditions. Additional guidelines were developed to enable them to discuss the various health topics more systematically and to probe for underlying problems. If necessary, subjects were advised to contact other health professional or referrals were to a general practitioner [111]. The results showed that no effect could be detected on health and well-being. The visits increased the use of community care to some extent. Some beneficial effects were found for more specialised forms of care (referral to outpatient clinics and hospital admissions), but the differences were not very large per person over the three years. The reduction of days spent in hospital was one day per person per year.

Included in 9 out of 11 reviews was the Roedovre project in Denmark by Hendriksen et al. (1984) [112]. The preventive home visits were carried out primarily by DNs, registered nurses (RNs) or general practitioner (GP). The structure used regarding these visits viewed the preventive home visit as a dynamic process and an offering of a trustful contact; not just a check-up but an opportunity to achieve an overall assessment of the older person's health, with elements such as an interview about the person's health and well-being, (including functional ability, welfare, life content, home conditions and possible self-determination), a review of medication, concrete agreements or management plans, and follow-up. The results showed that preventive home visits to older persons reduced admission to hospitals, reduced the number of days at the hospital, postponed an older person's need to move to nursing homes and mortality decreased [78]. These results led to a law offering all the citizens in Denmark 75 years of age or older two preventive home visit a year [113].

Included in 9 out of 11 reviews was the study from the South Wales by Pathy et al. (1992). In this study patients registered at a GP aged 65 and over were offered health screening in their homes by a geriatric home visitor. The nurse provided the older person health advices, health education and if health problems were identified, referral to GPs or community services. The study lasted 3 years. The results showed that mortality decreased, the duration of hospital stay of patients aged 65 to 74 years was significantly shorter and self-rated health status was superior in the intervention group compared with the control group. The conclusions were that, the use of a postal screening questionnaire with selective follow-up and intervention can favourably influence outcome and use of health care resources by elderly people living at home [114].

Included in 8 out of 11 reviews was the study in California at the beginning of 1990. Stuck et al. (1995) conducted a three-year randomised controlled trial (RCT) regarding the effects of in-home comprehensive geriatric assessment to older persons living in the community 75 years of age or older. It was gerontological nurse practitioners who, in collaboration with geriatrics, evaluated health problems and risk factors. The in-home

visit included: medical history taking, a physical examination, (hematocrit and glucose measurements in blood samples, a dipstick urinalysis, and a mail-in fecal occult-blood test), ideal body weight, vision, hearing, oral health, mental status (presence or absence of depression and cognitive status), gait and balance, medications, social network and quality of social support, safety in the home and ease of access to the external environment. Thereafter the nurse, together with the GP, developed rank-ordered recommendations, and conducted in-home follow-up visits every three months to monitor the implementation of the recommendations. The older person was encouraged to take an active role in their care to improve health. Annually all of the older persons in the intervention group were offered the geriatric assessment [80]. The results showed that these home visits could delay the development of disability and reduce admission to nursing homes and were cost effective.

Included in three out of 11 reviews was the two-part study in the Netherlands by Nicolaides-Bouman in 2000 [115] and Bouman [98]. The study was aimed at older frail persons between 70 and 84 years of age over 1½ years. The home visiting nurses followed a structured protocol according to the nursing process [41]: diagnosis, planning of activities, carrying out the activities and evaluation. The home visit focused on face-to-face assessment, adequate communication between nurses and the older person, a client-centred approach, an individual plan, follow-up of compliance with the given advice and multiple visits. The visit lasted for about 1–1½ hours. The participants themselves were primarily responsible for carrying out the planned activities. To improve compliance, the nurses contacted the older person by telephone 1–4 weeks after each visit, depending on the type of advice given. The results showed that physical, psychological and social health problems were identified in nearly all visits and that 60% of the old persons reported having been helped regarding health problems. However no actual effect on older persons' health and well-being or reduction of health care was shown.

In Sweden preventive home visits for older persons began in 1998 following the allocation of resources by the government to 22 municipalities/county councils. The overall aims of the home visiting programs were to gather knowledge about how to promote health, prevent diseases and how to reduce use of health and social services. Different intervention programs were used in different municipalities/county councils. In these trails one common factor was identified. It proved to be important that the health visitor had physical, medical and psychosocial knowledge and awareness of environmental impact on health and well-being [116]. From these studies one thesis by Sahlén (2008) has been published. It is included in 2 out of 11 reviews. It was a randomised control trial (RCT) aiming at persons 75 years of age and older living in the north of Sweden. The preventive home visits followed 2 year structured program offering the older persons in the intervention group 4 preventive home visits (one every sixth month). The first visit was about physical activity, the second was about influenza vaccination and fall-prevention, the third was about eating habits and diabetes and the fourth was about home help, long time care access to health and dental care. If needed, between these fixed home visits, the home visitor supported those in need of help with, follow-up interventions and telephone contacts. Each visit lasted for 1½–3 hours. The results showed that the home visits postponed mortality [97], reduced health utilities and were cost effective [117].

In Germany, Dapp et al. (2011) carried out a RCT with a combination of preventive home visits and/or group sessions for persons older than 60 years of age. The older person could choose between a preventive home visit and/or a group session or both. An interdisciplinary geriatric team located at a geriatric centre, trained in health promotion and motivational methods performed the study. A specially trained nurse conducted the home visit including using the Health Risk Appraisal (HRA) questionnaire that includes: administrative information, chronic conditions, preventative care, medication use, symptoms of ill health, self-perceived health, physical activity, nutrition, injury prevention, tobacco use, alcohol use, vision, hearing, depressive symptoms, memory, social network, social support, basic and instrumental activities of daily living, socioeconomic information, education, occupation, living arrangement, and health measurements (weight, height, blood pressure, and cholesterol). The group sessions were led by: a nutritionist, a physiotherapist, a social worker and/or a geriatrician (team leader). The group session was about: eating habits, physical activity, active social participation, and successful aging. A study with a similar design was conducted in Gothenburg, Sweden for persons 80 years and older by Gustafsson (2012) [104]. The results showed that both the preventive home visits and the group sessions had a positive outcome on the older person's health, well-being and Instrumental Activities of Daily Living (IADL), and that the programme had a favourable effect on non-frail older persons but not frail older persons.

SUMMARY

Health and well-being often decline with age and many older persons find themselves with a decreasing ability to live independently in their homes. One way to tackle this problem is through preventive home visits. Although such visits have for more than 30 years been proposed as a primary health strategy to prevent disease and promote the health of older persons, the results of such interventions fluctuate. In addition, although preventive home visits have been part of health promotion work for older persons for more than three decades, it is difficult to assess the appropriateness of the intervention with respect to the outcomes being measured or to formulate hypotheses as to why or how a particular intervention should be expected to result in a particular outcome. However in these reviews, described above, three important factors were identified as being inherent to a positive outcome of the preventive home visit, a geriatric assessment, health problems identification and follow-up visits. There is also a need for increased scientific knowledge regarding the effectiveness of preventive home visits. In Stockholm the Executive Board of the County Council decided to implement such visits to 75-year-old persons performed by the DN. Although the DN has a comprehensive knowledge about older persons' health conditions the preventive home visit was a new responsibility and information about 75-year-old persons' health condition was important. When searching the literature many books and studies about older persons' health was found. However it was difficult to find comprehensive knowledge, specifically about the age group of 75-year-old persons, to use as a base for the preventive home visits. There were also questions as how to structure these preventive home visits as there is a lack of knowledge regarding the effectiveness of preventive home visits for 75-year-old persons by DNs.

AIMS

General aim

The general aim of this study was to describe 75-year-old persons' self-reported health and health conditions and to analyse the changes and effects on their health after a preventive home visits by the DN.

Specific aims

To describe 75-year-old persons' self-reported health conditions *(study 1)*

To analyse how the 75-year-old persons' health and well-being were associated with socio-demographic status adjusted and unadjusted SOC *(study 1)*

To produce a knowledge-base for DNs in the field of preventive home visits *(study 1)*

To analyse changes and effects on the 75-year-old persons' health conditions after a preventive home visit by the DN *(study 2)*

To analyse how the 75-year-old persons' health and well-being were associated with socio-demographic status adjusted and unadjusted for SOC after a preventive home visit by the DN *(Study 2).*

Ethical considerations

The study was approved by a scientific Ethical Committee at Karolinska Institutet, registration number: 2005/1377-31/2. It was performed with the answers from a postal questionnaire to 75-year-old persons and conducted in compliance with the Helsinki Declaration. The 75-year-olds had written information about the study, that participation was voluntary and guaranteed confidentiality.

An ethical consideration when working with quantitative data is that there are risks that too much focus is placed on graphs, numbers and statistics instead of a human-being perspective. However it is difficult to investigate effects of intervention without quantitative research.

METHODOLOGY

RESEARCH DESIGN

In this thesis a controlled design was chosen, including two studies carried out between March 2006 and March 2007 using quantitative research methods. Study 1 was a cross-sectional study describing and analysing the 75-year-old persons' self-reported health, health and well-being, health conditions and demographic status (sex, living arrangement and education). The second study had a longitudinal design and was aimed at the 75-year-old persons' changes and effects on health after a preventive home visit by DNs.

Study participants and setting

Participating HCCs (*study 1, study 2*)
The Stockholm County Council was comprised in 2006 of 190 HCCs in five geographical areas, covering both urban and rural communities. The County Council proposed the inclusion of an HCC from all five areas in this study. A selection criterion for the study was that at least three DNs were employed at the HCC. A total of 124 HCCs fulfilled the selection criterion (ranging from 20–30 HCCs in each of the five areas). The names of these HCCs were written on pieces of paper which were put into five boxes, one for each area. Names were then randomly drawn from each of the five boxes and eight HCCs were assigned to the study group (SG) and eight to the control group (CG).

The study group (*Study 2*)
After the selection procedure, the directors of each of the eight HCCs in the SG were contacted by telephone. If they declined to participate, a new name was drawn from one of the five boxes. This procedure was repeated five times until the SG was finalised. The directors who accepted to participate were given further details about the study both orally and in writing and were asked to arrange a meeting between the researchers and the DNs. At the meetings the DNs (n=35) were given a detailed description of the study both orally and in writing. They were also informed of the preventive home visit and the one-day course they would have to take as a prerequisite for participation in the study.

Participating 75-year-old persons (*study 1, study 2*)
In March 2006, the 75-year-old persons' names and addresses were retrieved from the Stockholm County Council's database, yielding 385 persons registered at the eight HCCs in the SG and 405 persons registered at the eight HCCs in the CG. Next, the questionnaire, an information letter and a self-addressed envelope were sent to all 75-year-old persons in the SG and CG. The letter informed them that participation was voluntary, instructed them in how to answer the questionnaire and ensured them that their answers would be handled with confidentiality. The response rate was 73% (n=280) in the SG and 75% (n=303) in the CG. Of the 105 persons in the SG who did not fill in the questionnaire, 2 had died, 9 had unknown addresses and 94 did not return

the questionnaire. Of the 102 persons in the CG who did not fill in the questionnaire, 3 had died, 8 had unknown addresses and 91 did not return the questionnaire.

The study group (*study 2*)
The 35 DNs offered the 75-year-old persons in the SG (n=383) a preventive home visit, of which 59% (n=220) accepted. Of those persons who declined, 7 had died, 5 did not live at the address, 1 lived in a nursing home, 23 could not be reached, 15 had dementia or stroke, 9 declared they were healthy and did not need it, 85 had no interest and 18 gave no reason. The preventive home visit took place between April and December 2006. The follow-up questionnaire was sent in March 2007 to the 75-year-old persons in both the SG (now n=366) and the CG (now n=394). The response rate for this questionnaire among those in the SG was 74% (n=271) and for those in the CG 73% (n=290). In the case of the SG, the period between the preventive home visit and the follow-up questionnaire was 3–11 months (md 6 months). Of the 220 participants who received a preventive home visit, 44 persons were excluded in the analysis since not having returned both questionnaires. For the CG this number was 28 persons. Final analyses included 176 questionnaires (persons who filled in both questionnaires and had a preventive home visit) in the SG and 262 questionnaires (persons who filled in both questionnaires) in the CG (Figure 1).

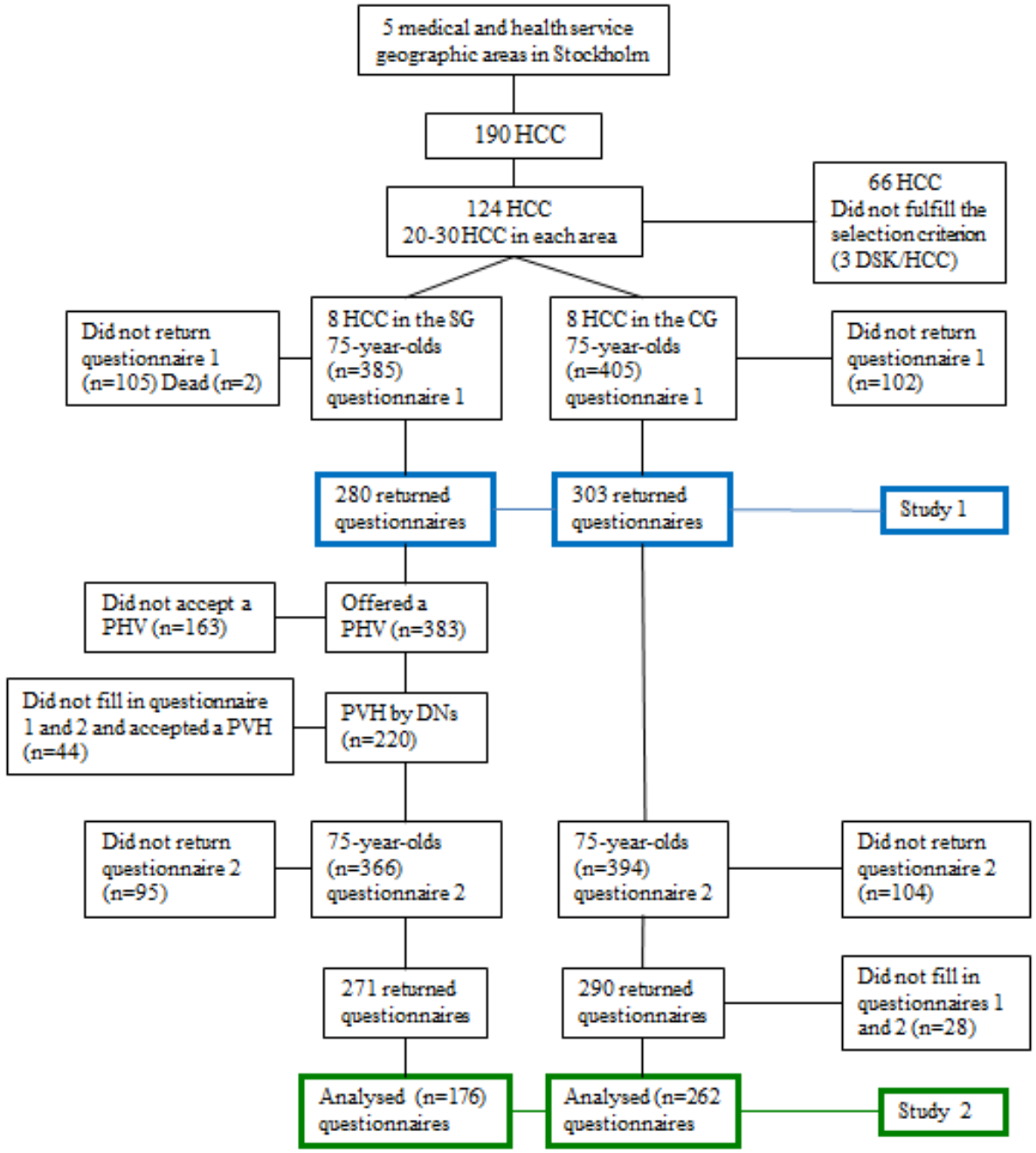

Figure 1. Flowchart of participating 75-year-old persons in 2006 and 2007.

The one-day course

As a starting point the DNs took part in a one-day course. It was based on the DN profession. In Sweden, DNs enter the occupation by completing a bachelor's degree in nursing, followed by 50 weeks of specialist training (75 credits according to the European Credit Transfer System). This specialisation equips the DN with the competence to care for people of all ages [75] using a holistic approach [73] at home and/or the HCC. DNs work closely with family doctors and other staff at the HCC and in the local community [75].

Learning outcomes of the one-day course were:

- to identify the 75-year-old persons' health conditions and how this was related to their living environment,
- to support the 75-year-old persons' self-care activities and empowerment,
- to use a person-centred salutogenic approach,
- to use district nursing interventions and evaluate these interventions,
- to document in the 75-year-old persons' records.

The DNs received the following accessibilities, literature and documents:

- a health dialogue guide adapted to the nursing process [41] with keywords from the nursing documentation model VIPS [45, 46].
- two books: *Promoting Health: A practical guide* (in Swedish) [118] and *Health and Health Promotion regarding Older People* (in Swedish) [12].
- a folder with: an invitation letter template about the offer of a preventive home visit, a list of possible activities in the neighbourhood that the DN could inform the 75-year-old person about (e.g. non-governmental organisations, leisure time activities, the local community service and the County Council facilities), a brochure describing the process of record keeping according to VIPS [44] and a brochure about safety at home to give to the 75-year-old persons.

The preventive home visit

To initiate the preventive home visit the DNs were asked to send an invitation letter to the 75-year-old persons in the SG to offer them such a visit and thereafter to contact them two weeks later by telephone to book a time. If any suspected health problems appeared, it was possible to evaluate them using various assessment tools, testing blood sugar content, prescribing material for patients with diabetes or incontinence and checking the person's medication and/or coordinating care if needed. The DNs were to give the 75-year-old persons information about activities in the neighbourhood, local community and county council and a brochure about safety at home. Thereafter the 75-year-old persons and the DN were to decide if there was a need for a follow-up contact at the HCC or at home. The preventive home visit was expected to last for about 60 minutes and to be documented in the 75-year-old person's patient record. During the preventive home visit the DNs were asked to use the structure in the health dialogue guide (based on the nursing process) and to offer a blood pressure control. In order to promote health and well-being and to identify 75-year-old persons in need of

preventive home visiting interventions a dialogue guide following the nursing process was created (appendix 1).

Data collection

The 75-year old persons completed a questionnaire consisting of 88 items that covered socio-demographic status, Health Index (HI), Sense of Coherence (SOC), general health, health behaviour, health problems, knowledge about and contact with the local community and the County Council and use of medication. In the first study 68 and in the second study 86 items in the questionnaire were used. At the follow-up two questions were added for the SG about the usefulness of the preventive home visit. An overview of the questions is presented in table 2. The composition of the total questionnaire was made by authors using both validated and non-validated sub-questionnaires. The questionnaire was first tested for content validity by an expert group of five DNs working at one Health Care Centre in the county council of Stockholm and three DNs working at CeFAM. All points of view were considered, after which minor modifications were made. Thereafter the questionnaire was tested on eight 75-year-olds.

Table 2. An overview of the questionnaire to the 75-year-old persons.

Study questions areas	No*	St* 1	St* 2	Concerning	Response alternative
Socio-demographic status	3	x	x	sex living arrangement education	man, woman living alone or living with someone elementary school, upper-secondary school and university
Health and well-being (Health Index)	10	x	x	energy, mood, fatigue, loneliness, sleep, vertigo, bowel function, pain, mobility, perceived health and well-being during the previous week	1=very poor 2=fairly poor 3=fairly good 4=very good
Sense of Coherence	3	x	x	manageability meaningfulness comprehensibility	1=no 2=sometimes 3=often
General health	4	x	x	general health physical health psychological health health compared to others	1=very poor 2=fairly poor 3=fairly good 4=very good
Health behavioural	10#	x	x	eating habits, physical activities, activities regarding leisure activities, smoking, use of snuff, alcohol intake, weight, height. relationship with relatives (study 1) wishers of activities (study 1)	1=not at all 2=sometimes 3=often 4=always yes or no open-ended question
Health problems	38	x	x	hearing, sight, speech, taste, memory, understanding of health and illnesses, breathing, coughing, angina pectoris, oedema, cold feet, vertigo, under/overweight, difficulties swallowing, nausea, urine/faeces incontinence, disorder of skin, mouth blisters, oral health, itching, fatigue, mucous membrane, wounds, ulcers, cleaning, climbing stairs, walking indoors and outdoors, shopping, something meaningful to do during the day, shower/bath, economy, pain, sexuality, anxiety, low-spiritedness, loneliness	the statements were: I have a problem with I need help with not applicable yes or no
Knowledge about and contact with the local community and the county council	8		x	where to turn for assistance, home-help service, leisure time activities, have or have had contact with local HCC and DN, home-help service both current and past	yes or no
Use of medication	10		x	used prescribed medicines, sleeping pills, if they believed they were taking too much medication, knowledge about their prescribed medicines, difficulties in taking, keeping, remembering their medicine, side effects, help with their medication, use of any natural medicine	yes or no
Usefulness of the preventive home visit	2		x	did you find preventive home visits useful, describe your experience from the preventive home visit	1=no use at all 2=some use 3=good use 4=very good use open-ended question

* No=number of questions asked in each sub-questionnaire, St=study

Two of the ten questions were only asked in study 1

Analysis

Statistical analysis

In this thesis different statistical methods are used, see table 3. Self-reported health and well-being as well as other questionnaires are often ordinal data, i.e. an ordered scale where the distance between each step on each scale does not necessarily need to be equal. This is different to dichotomous data where the answers can be only 'yes' or 'no'. Questions with both ordinal and dichotomy answers were used in this study. In the first study the differences between levels of explanatory variables were inferred using the Chi-square test for categorical variables and Student's t-test for continuous variables where requirements for normality were met. To test the association between health and well-being (based on HI scores) and sense of coherence (based on SOC scores), assuming that these two were correlated, Pearson's correlation was used. To analyse health and well-being (HI scores) among groups regarding socio-demographic data, Analyses of Covariance (ANCOVA) were used. ANCOVA has much in common with multiple regression and is used to compare the means of several groups at the same time. A central question is if the mean group difference is likely to be genuine [119]. To estimate mean and 95% confidence intervals (CI) for HI score, with sex, living arrangements and education as separate categories, adjusted and unadjusted for SOC ANCOVA was applied. Fisher's exact test was applied to identify socio-demographic differences between the 75-year-old persons in the SG and those in the CG at baseline.

When ordinal data are paired, Wilcoxon signed-rank test can be used to estimate mean rang for differences in the pairs. This was used in this study when measuring the difference in health and well-being (HI scores) between 2006 and follow-up. To statistically rank the sum of observations in order to test for the effect of treatment, the Wilcoxon rank-sum test was used. The reported health problems were grouped together in different categories and changes in the number of health problems reported from 2006 to 2007 and between the SG and CG were analysed using the Wilcoxon signed rank test. Treatment effect for VIPS was estimated by a Generalised Estimating Equation (GEE) Poisson model, except for pain and sexuality which were analysed using GEE. GEE is a logistic model which can be used to handle dichotomous outcome variables in which the responses are correlated [120]. Knowledge about and contact with the local community and county council as well as use of medication were analysed in two steps. First, changes occurring from 2006 to 2007 were analysed using the Wilcoxon signed-rank test. Then effects of the preventive home visits were assessed by generating a GEE logistic model.

Power

The sample size for the participant groups was determined by power analysis. It was based on similar studies from the literature, which all experienced an attrition rate of approximately 25% [80, 112]. Assuming to detect a difference of 15% between the intervention group (p=0.85) and control group (p=0.65), a power of 80%, an alpha of 0.05 and a two-tailed test resulted in 138 individuals per group.

Table 3. An overview of statistical methods.

	Chi-square	Student's t-test	Pearson's correlation	Analysis of covariance (ANCOVA)	Fisher's exact test	Wilcoxon signed-rank test	Wilcoxon rank-sum test	Generalised Estimating Equation (GEE)
Study 1	x	x	x	x				
Study 2				x	x	x	x	x

Qualitative description

To describe the 75-year-old persons' experience from the preventive home visit (one open ended question) the comments were sorted and categorised.

RESULTS

STUDY 1

Study 1 provided various aspects about the 75-year-old persons' self-reported health conditions.

Health problems

The results showed that there were no significant differences between the SG and CG regarding sex, living situation and education at baseline. One main result was that the 75-year-old persons experience their general health as good or very good at the same time as they report many health problems. Sixty-four (11%) of the 75-year-old persons were physically inactive, 143 (25%) were inactive regarding leisure activities and 172 (30%) were not strict about what they ate. Body Mass Index (BMI) ranged from 15.8 to 39 (mean 25.9, SD 3.96). There were 102 (16%) with BMI$\leq$22.5=low body weight, 355 (68%) with BMI between 22.5 and 29=normal body weight and 102 (16%) with BMI $\geq$ 29.5=excessive body weight. Furthermore, 70 (13%) were smokers, 26 (5%) were snuff tobacco users and 323 (57%) reported drinking alcohol. Of the 38 questions about health problems, the eight most common were, in descending order: eyesight, difficulties in understanding and lack of knowledge about one's own health and illnesses, hearing, oral health, elimination patterns, pain, sleeping and fatigue. There were significant gender differences ($p<0.01$) in five of the 38 questions. Men reported problems with hearing, elimination patterns and sexuality more often than women did, whereas women reported problems with sleeping and pain more often than men did. There were significant differences ($p<0.01$) between those who lived alone and those who lived with someone. Participants who lived with someone reported problems with hearing and sexuality more often than those who lived alone, whereas persons who lived alone reported problems with loneliness, climbing stairs, pain, fatigue, sleeping and walking indoors more often than those living with someone. The eight most commonly reported problems the older person needed support and help with were, in descending order: anxiety, cleaning, elimination patterns, under- or overweight, difficulties in understanding of one's own health and illnesses, low spirits, pain and fatigue. In general, the 75-year-old persons reported that they needed support and help with 1 health problems (rang between 0 and 7) per person.

Health and well-being (HI)

To measure the 75-year-old persons' self-reported health and well-being (based on HI score) both the sum of all aggregated scores and of aggregated scores for each of the variables in the HI questionnaire were used, see table 4. The sum of all aggregated HI scores for all participants was 27.9 of a possible 36. Women and those who lived alone had lower HI mean scores than did men and those who lived with someone, see table 4.

Table 4. Self-reported health and well-being in total, by sex and living arrangement in 2006 (n=563).

Health Index	Total			Sex						Living arrangement					
				Men			Women			Living alone			Living with someone		
	mean	SD	Md	mean	SD	Md	mean	SD	Md	mean	SD	Md	mean	SD	Md
Aggregated HI score	27.9	4.2	28	28.5	4.0	29	27.5	4.3	28	26.7	4.5	27	28.6	3.9	29
Energy	2.8	0.6	3	2.8	0.6	3	2.9	0.6	3	2.8	0.6	3	2.9	0.5	3
Mood	3.1	0.6	3	3.1	0.6	3	3.1	0.6	3	3.0	0.6	3	3.1	0.6	3
Fatigue	2.8	0.7	3	2.8	0.7	3	2.7	0.7	3	2.7	0.7	3	2.9	0.7	3
Loneliness	3.4	0.7	4	3.5	0.7	4	3.4	0.7	4	3.1	0.7	3	3.6	0.6	4
Sleep	3.0	0.8	3	3.1	0.7	3	2.8	0.8	3	2.8	0.6	3	3.1	0.7	3
Vertigo	3.3	0.7	3	3.4	0.7	4	3.3	0.7	3	3.2	0.7	3	3.4	0.7	3
Bowel function	3.4	0.8	3	3.5	0.7	4	3.3	0.8	3	3.3	0.8	3	3.4	0.7	4
Pain	2.7	0.9	3	2.8	0.9	3	2.6	0.8	3	2.6	0.8	3	2.8	0.9	3
Mobility	3.4	0.8	4	3.4	0.8	4	3.4	0.7	4	3.3	0.8	3	3.4	0.7	4

A higher HI score describes better reported health.

Sense of Coherence (SOC)

The aggregated SOC scores for all 75-year-old persons ranged between 3 and 9 (mean 7.56, SD 1.3). There were 63 (21%) with weak SOC, 283 (48%) with intermediate SOC and 157 (31%) with strong SOC (weak SOC=3–6; intermediate SOC=7–8; strong SOC =9).

Association between HI, sex and education

The association between health and well-being (based on HI scores), sex and education showed that women and those with elementary school education reported worse health and well-being compared to men and those with upper secondary school and university education as illustrated in figure 2.

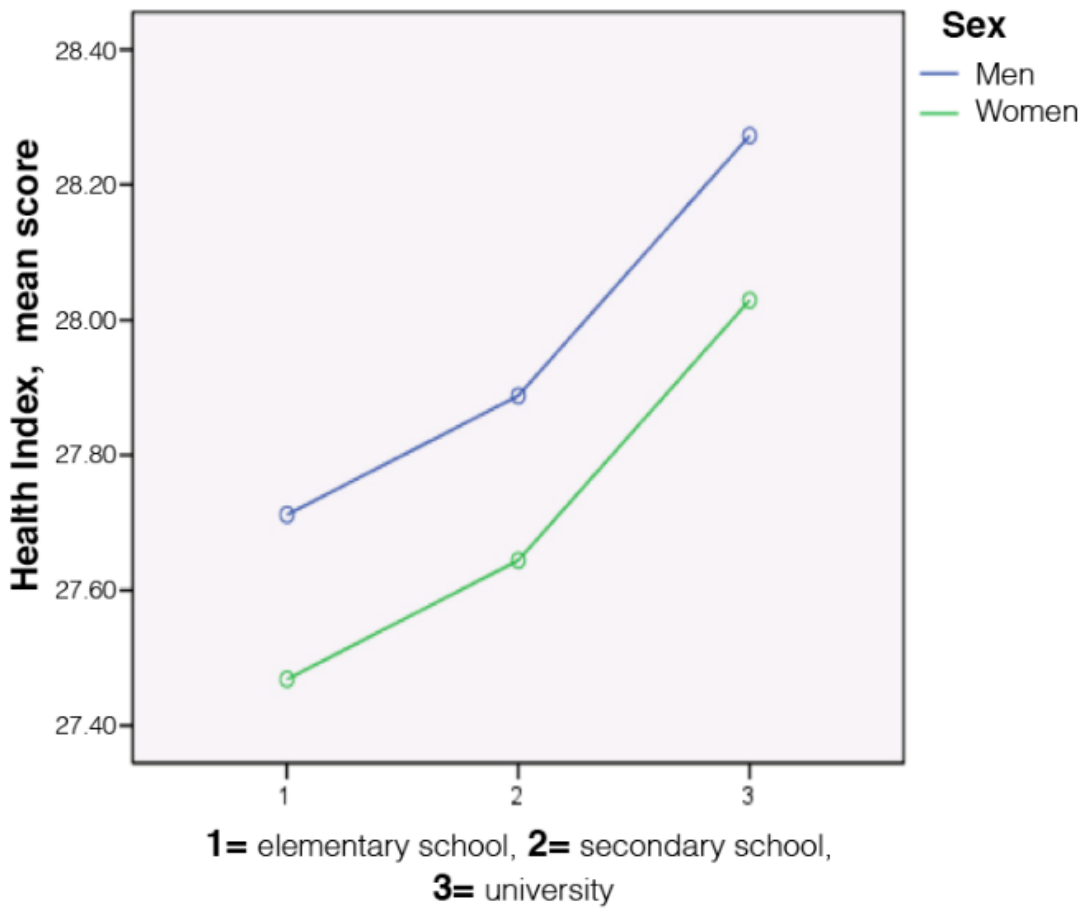

Figure 2. Illustration of the association between health and well-being, sex and education.

STUDY 2

Health problems

At follow-up the CG reported significantly more health problems in 2007 than in 2006 in the category of ADL.

Health and well-being (HI)

The results show that both the SG and CG reported a significant decline in health and well-being (based on summarised HI scores, 9 variables) at follow-up, see table 5. In the SG, the variables of energy and loneliness were affected whereas in the CG the variables of energy, fatigue, vertigo, loneliness, pain and mobility were affected.

Table 5. The 75-year-old person's reported health and well-being (HI scores) and p-value difference from 2006 to 2007 and treatment effect.

	Study group (n=173)			Control group (n=255)			
	2006	2007		2006	2007		Treatment effect
	Mean rank	Mean rank	p-value[1)]	Mean rank	Mean rank	p-value[1)]	p-value[2)]
Summarised HI	27.6	27.1	0.01	28.6	28.1	0.00	0.53
Energy	2.8	2.7	0.01	2.9	2.8	0.01	0.75
Mood	3.1	3.0	0.16	3.2	3.1	0.22	0.84
Fatigue	2.7	2.7	0.21	2.9	2.8	0.01	0.48
Loneliness	3.4	3.3	0.03	3.5	3.4	0.03	0.57
Sleep	2.9	2.9	0.91	3.0	3.0	0.47	0.74
Vertigo	3.2	3.1	0.07	3.5	3.4	0.01	0.82
Bowel function	3.4	3.3	0.15	3.4	3.4	0.93	0.24
Pain	2.7	2.7	0.73	2.8	2.7	0.01	0.19
Mobility	3.3	3.3	0.56	3.5	3.4	0.00	0.20

1) Changes were tested by Wilcoxon's signed-rank test
2) Treatment effect was tested by Wilcoxon rank-sum test

Summarised HI scores 9–36, each item 1–4.
Higher scores indicate better health and well-being.

Sense of Coherence (SOC)

At follow-up no significant changes were found in SOC in the two groups (data not shown).

HI, SOC and socio-demographic data

At follow-up, no socio-demographic groups (sex, living arrangement, education) showed any significant effects from the preventive home visit adjusted or not adjusted for SOC (data not shown).

Knowledge about and contact with the local community and county council

At follow-up, the SG reported a significant increase in knowledge about the services offered by the county council. The preventive home visit showed a significant effect on knowledge about the local community and the value of staying in contact with the visiting DN and the local HCC, see table 4.

Table 6. The 75-year-old person's self-reported knowledge about, contact with the local community and the county council and p-value difference from 2006 to 2007 and treatment effect.

Knowledge about and contact with local community/county council	Study group (n=176)					Control group (n=262)					Treatment effect
	2006		2007			2006		2007			
	n	(%)	n	(%)	p-value[1)]	n	(%)	n	(%)	p-value[1)]	p-value[2)]
Do you know where to turn to if you need aid assistance like a walking stick or incontinence aid?	129	(73)	144	(82)	0.02	201	(77)	201	(80)	0.21	0.37
Do you know where to turn if you need home help service?	95	(54)	13	(70)	0.00	193	(74)	196	(75)	0.25	0.02
Do you know where there are free time activities?	101	(57)	107	(61)	0.46	180	(69)	173	(66)	0.65	0.36
Have you the last 6 months been in contact with your health care centre?	120	(68)	130	(74)	0.09	191	(72)	201	(73)	0.69	0.29
Have you the last 6 months been in contact with your DN?	77	(44)	104	(59)	0.00	119	(45)	116	(44)	0.75	0.01
Are you at present in contact with your DN at the Health Care Centre?	27	(15)	43	(24)	0.02	50	(19)	48	(18)	0.56	0.03
Have you got home help service?	6	(3)	9	(5)	0.18	9	(3)	13	(5)	0.25	0.95
Have you previously had home help service?	6	(3)	11	(6)	0.10	15	(6)	18	(7)	0.48	0.28

1) Changes were tested by Wilcoxon sign rank test
2) Treatment effect was tested by GEE

Higher scores indicate better knowledge and more contact

Use of medication

At follow-up both the SG and the CG consumed significantly more medicine.

Usefulness of the preventive home visit

Of the 139 (79%) persons in the SG who answered the question about the usefulness of the preventive home visit, 18 (13%) reported very good benefit, 65 (47%) good benefit, 33 (24%) some benefit and 23 (16%) no benefit. Ninety-one (66%) of the 139 persons

had written 113 comments (110 positive and 3 negative) regarding the usefulness of the preventive home visit.

DISCUSSION

GENERAL DISCUSSION

The general aim of this project was to describe 75-year-old persons' self-reported health and health conditions and to analyse changes and effects on their health after preventive home visits by the DN. The intervention targeted 75-year-old persons living in their homes independent of health condition and/or if they received any home help service. The strategy for the DNs when performing the preventive home visit was to follow a predetermined structure especially developed for the study. The first study described the 75-year-old persons' self-reported health conditions and analysed how this was associated with socio-demographic status adjusted and unadjusted for SOC. This was also to be the foundation for a knowledge base for DNs in the field of preventive home visits. The second study analysed changes and effects on the 75-year-old persons' health conditions and analysed how their health and well-being were associated with socio-demographic status adjusted and unadjusted for SOC after a preventive home visit by the DN.

Health promotion and disease prevention

When analysing the results from a health promotion and salutogenic perspective one interpretation is that health and well-being for persons aged 75 are more than just the absences of ill-health, as there were 85% who reported good or very good health at the same time as they reported an array of health problems *(study 1).* To keep older persons healthy the salutogenic approach nowadays is an important part of health promotion [121]. When analysing the result from a disease prevention and pathogenic perspective the findings showed a decrease in health and well-being (based on summarised HI scores) as well as an increase in medication use in both the SG and CG at follow-up, indicating that ill-health increases with age *(study 2).* There has been a discussion as to which perspective should be used regarding preventive home visits; however this study showed that both perspectives are needed. It has been found difficult to clearly differentiate between health promotion and disease prevention [59], and according to WHO in the Ottawa Charter (1986) they overlap each other [49]. The fact that most 75-year-old persons were aware of the benefits of an active lifestyle *(study 1)* is something the DN should encourage, as even a minimum of regular physical and leisure activities improves long-term survival [122] and postpones cognitive decline [25]. However despite participant s' awareness of a healthy life-style many health problems with regards to health behaviour were identified, e.g. one third reported either over- or underweight, 25% reported lack of activities and 13% were smokers *(study 1).* The question about alcohol use gave no substantial information (due to the formulation of the question) which was too bad, as alcohol use and misuse amongst older persons is increasing according to the most recent public health report [14]. No difference in self-reported health regarding health behaviour was identified as an effect of the preventive home visit *(study 2).* One explanation could be that changes in health behaviour take time and therefore a 12-month study may not have been long enough and a much longer intervention and follow-up time may have been necessary for the intervention to have a greater impact on the 75-year-old persons' health. The time perspective needed

regarding health behaviour changes may be a reason for increasing the number of preventive home visits, especially when it comes to follow-up contacts, which have been shown to be important for older person s' health and well-being [17-19, 23, 53, 57]. Another explanation might be that a one-hour preventive home visit is not enough if health education, which is a necessary part of health promotion, is going to take place. Over 40% of the participants reported problems in knowledge and understanding of their own health and illnesses *(study 1).* Adequate understanding of one's own health condition is crucial if the patients are going to be engaged in their own care and follow medical instructions and advice given [59]. A favourable outcome was that preventive home visits increased the 75-year-old persons' knowledge of where to turn for aids assistance and home-help service. This is positive as it is known that knowledge is associated with better self-determination and control and is at the heart of empowerment in connection with health and well-being [123].

Furthermore the results showed that preventive home visits to 75-year-old persons provided them with opportunities for improving their contact with both the DN and the HCC. This might have had a favourable effect on health in that it enabled the DN to capture health problems early on and suggest suitable preventive measures or to identify unmet needs that might otherwise have been neglected. Variables such as pain, vertigo, fatigue and mobility appeared unchanged in the SG, indicating more stable health and well-being in persons of this group, than in those of the CG. These health problems are frequently reported by older people [19, 32]. There was also an increase of health problems in the category of ADL for the CG *(study 2).* Perhaps the CG did not know where to turn with regards to aid and information about the local community, knowledge the SG received during the preventive home visit. To identify and care for health problems through multifaceted interventions can help older persons to continue to live at home and to decrease the need for nursing-home care [89] which is in agreement with the implemented policies that support the notion that people should live independently in their homes for as long as possible [124, 125]. There are studies showing that this decline in health and well-being might be prevented or delayed with the application of preventive home visits [90, 93].

It was observed that the inequality in health and well-being between groups, those living alone, those with elementary school education and those who were women, reported worse health than did other groups which is in agreement with earlier studies [1, 126]. At follow-up no group benefited more than others. This differ from Sahlén (2006) [97], Vass (2007) [79, 106] and Stuck (2008) found in their studies. This can be important information as it is vital to match health care interventions with the target group [1, 79]. Within the salutogenic perspective for older persons special attention should be made to those who have low SOC as it has been shown that they have more difficulties in making use of the resources for health in physical and social environments than those older persons with a high SOC [121]. SOC accounted for a small variance in reported health and well-being. The significant finding was that SOC appeared to compensate for the lower ratings of HI among persons with elementary school education.

The predetermined structure

In this study older person aged 75 were offered a preventive home visit not because they were ill or suffered from any disease. They were targeted simply because they lived independently in their homes in a specific geographically area. The preventive home visit followed a predetermined structure that followed the nursing process, used a person-centred approach. The structure called for only one visit and, if needed, one follow-up contact. However we do not know to what extent this was done. The offer was to be thought of as an opportunity for the participants to discuss health their health conditions, to gain knowledge and to learn about the health care system. Whether the age of 75 years is the best age for salutogenic interventions like preventive home visits is difficult to say and because of the broad environmental context and substantial variations in the format of care the preventive home visiting models are difficult to compare with each other. However this predetermined structure proved itself to be valuable as it was easy to implement at the HCC and in that it had some positive effect on health and well-being. However, the knowledge gained from study 1 would have been valuable knowledge to have before the DNs performed the preventive home visits and we can only speculate as to how this might have increased the benefits for the 75-year-old persons. This knowledge was not possible to incorporate into the predetermined structure of the preventive home visits or into the DNs' one-day course, due to the study design in which the DNs were selected at the same time as the first questionnaire was sent out.

Today, preventive home visits for 75-year-old persons by a DN are implemented within the Stockholm County Council in Sweden. During the implementation process the preventive home visit and the preparatory course have been developed so that the course is now two days long and the health dialogue guide includes a contingency plan that focuses on changes in health behaviour as well as specific health problems such as pain, sleeping problems and loneliness.

METHODOLOGICAL CONSIDERATIONS

Limitations and strengths

In order to obtain a comprehensive understanding and knowledge of the 75-year-old persons' self-reported health conditions both validated and non-validated sub-questionnaires were used *(*4 in *study 1*, 7 in *study 2)*. This strategy was chosen since other questionnaires, e.g. SF-36 and EQ-D5, did not answer the aim of this study. Using the status keyword in the VIPS documentation model turned out to be valuable as it generated cohesive, broad and some new information on the 75-year-old persons' health problems, such as the lack of understanding of health and illnesses, the fact that weighing too little was a common health problem and the fact that different socio-demographic groups reported different health problems. The reason for choosing the HI questionnaire was that it is commonly used in Swedish health care settings and is concise and easily collected. Rather than excluding any measure of SOC (because of the length of the main questionnaire) a short questionnaire containing three questions was used. We were aware of claims that internal consistency was low [127]. However,

two other studies showed the opposite to be true and claimed good reliability [128, 129]. Therefore, a decision was made to use the short questionnaire.

One limitation of a questionnaire is information bias. The 75-year-old persons might not have mentioned all the health problems they had because: a) they were not aware of them, b) they had learnt to live with them, c) they did not want to talk about them or d) their memory was failing them, all of which may have resulted in incorrect answers to the questions. Other limitations are internal and external drop-outs. In study 1, incomplete sub-questionnaires were removed, as health and well-being is an individually perceived value and cannot easily be auto-coded. With regards to the study 2 the internal drop-outs were treated in a different way. When analysing the data using the GEE analysis method all questionnaires were included. However when using Wilcoxon ranked-sum test and the Wilcoxon signed-rank test only complete cases were included as the tests cannot handle incomplete questionnaires, this may also mean that the number of individuals included might vary in the different variables. Another limitation of the study was that the period between the preventive home visit and the follow-up questionnaire varied (between 3 and 11 months with an md of 6 months). The gap may have influenced the answers in that the 75-year-old persons may have forgotten what had been discussed or what kind of health problems they had been helped with and therefore didn't report their experiences accurately. Another possible weakness was that no non-response analysis for those who did not return the questionnaires (approximately 25%) was made. In contrast, a non-response analysis of the 75-year-old persons who declined a preventive home visit was made, showing that some believed that they were too healthy or too ill and some were not interested. This result is in agreement with earlier studies [90, 130-132]

One strength of this study was that it focused on a well-defined group (75-year-old persons) and was based on self-reported health which has been found to be an important determinant in predicting diseases and future health care [61, 133]. In addition it was performed by a well-educated home visitor (the DN), which has been found to be of importance [79], it had a well described predetermined structure, which might make it easy to replicate, and it had sufficient power. Another strength was that no significant gender difference with regard to external drop-outs was observed between participants and dropouts. Furthermore the study had a nursing perspective and to our knowledge no other study has used the VIPS documentation model to investigate older persons' health conditions. The model describes, in the main, the primary health care work performed by DNs [47].

Outcomes measured

Whether or not a questionnaire was the best way to measure the changes and effects from the preventive home visit can be discussed. Many studies use 'hard' health outcome data such as admission to hospital and/or nursing home, mortality and assessments tools and/or clinical examinations performed by health care professions before and after the intervention. Due to limited resources and the short intervention time (1 year) 'hard' outcome data was not collected. Instead self-reported health, which is a good determinant to use regarding health problems and future care, was used. Additional questions about health conditions and medication were asked. Studies in the

field of preventive home visits to older persons that have included health resource utilisation as an outcome variable have found a decrease in the consumption of care [78, 80, 94, 97, 134] as an expected outcome. In this study there was an increase in the contact with the DN. However as the DNs performed the preventive home visit the same year as the questionnaires were completed and collected, this was an obvious outcome. There was also an increased contact with the HCC. One explanation to this could be that the DN helped the 75-year-old persons in identifying their health problems and unmet needs, and suggested appropriate interventions. Tailored advice and the health professional's involvement regarding nursing care and community services might increase the contact between the patient and the nurse instead of decreasing it [103, 111] which may lead to benefits later than could be captured after this study which had a one-year follow-up. Another point of view to highlight is whether 'hard' data is the only way to evaluate the preventive home visits. Of importance must be the 75-year-old persons' own opinion about the benefits from the home visit and that it made some of them feel safe and secure. The literature suggests that effective interventions need to address the whole person rather than focusing on a single item, since older persons often have coexisting physical, psychological, environmental and social health problems interrelated with each other [135]. There was no reason to believe that a potential information bias existed between the SG and the CG at the first data collection. However there may be a difference between the groups at the second data collection. This could be due to the SG, after their meeting with the DNs, becoming more aware of their health conditions than the CG. In such case, there may have been less reported health problems in CG which may have affected the results.

When evaluating the small effect of the preventive home visit on the persons' health certain factors need to be considered. One of them is that a one-day course may have been insufficient especially since the DNs in this study were new to preventive home visits. Other factors were that the preventive home visits were integrated into an already activity-heavy organisation and that one preventive home visit may not have been enough. Or, perhaps it is as Clark 2001 stresses: preventive home visits effectiveness cannot be judged by RCTs [136].

FUTURE RESEARCH

There is a need for future research in the context of preventive home visits regarding:

- to investigate the understanding of the underlying foundation of the preventive home visit,
- to get a deeper understanding of the social interaction between the older person and the DN,
- to follow-up the implementation of the preventive home visits at HCC.
- to investigate if the preventive home visits show effectiveness with regards to health-economics,

CLINICAL IMPLICATIONS

The results of this study indicate that the preventive home visits are valuable for 75-year-old persons and should be part of the health care system. The results also imply that both health promotion and disease prevention strategies are necessary when performing preventive home visits to persons of 75 years of age and give a suggestion as to what the DNs should be aware of when performing preventive home visits. The DNs and other health care professionals must be aware of the inequality in health and well-being between different groups of 75-year-old persons and need to avoid assuming that all older persons have the same needs for support regarding health behaviour changes and health issues. It is also important for them to avoid assuming that older persons have adequate knowledge regarding their health and illnesses and form an opinion about the level of knowledge the older person has. Findings from this study can contribute to creating a comprehensive knowledge base about health issues concerning 75-year-old persons which can be used by the DNs' and other health care professionals. The findings can also be used in the DN's education.

CONCLUSION

The 75-year-old persons reported their health and well-being as good or very good at the same time as a variety of health problems emerged.

Living alone, having a poor educational background and being a woman appear to be socio-demographic risk factors for health and well-being, as these groups reported worse health and well-being and more health problems compared with other groups.

Preventive home visits following a predetermined structure performed by DNs identified health problems (pain, vertigo, fatigue, mobility, ADL) of which some of the 75-year-old persons wanted help with and increased knowledge about the services and resources offered by the local county council and local community but did not have any effect on health behaviour or reduced the use of medication.

Health promotion and disease prevention strategies are necessary when working with preventive home visits for 75-year-olds persons as many participants self-reported an awareness of a healthy lifestyle but also perceived that they had health problems.

The majority of the 75-year-old persons reported that the preventive home visit was useful and that it made them feel secure.

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SVENSK SAMMANFATTNING/SWEDISH SUMMARY

BAKGRUND

Handlingsplaner behövs när det gäller att främja hälsa och förebygga sjukdomar bland äldre personer så att de kan bo kvar hemma, med god hälsa, så länge som möjligt. Ett sätt som prövats i många länder är förebyggande hembesök. I Sverige, beslutade Stockholms läns landsting att införa förebyggande hembesök till personer som var 75 år genomförda av en distriktssköterska. Det väcktes emellertid frågor om hur dessa på bästa sätt kunde struktureras så att de äldres hälsa främjades och sjukdom förebyggdes.

SYFTE

Det övergripande syftet var att beskriva 75-åriga personers självrapporterade hälsa, välbefinnande och hälsoproblematik samt analysera förändringar och effekter på deras hälsa efter hälsosamtal i hemmet genomförda av distriktssköterska.

METOD

Studie 1 beskrev 75-åringarnas rapporterade hälsa och hälsoproblem (n=583). I *studie II* randomiserades åtta vårdcentraler (VC) till en studiegrupp (SG) och åtta till en kontrollgrupp (KG). De 75-åriga personer som tillhörde dessa VC, SG (n=176) och KG (n=262) besvarade ett frågeformulär om hälsa och välbefinnande, hälsoproblem, kunskap om landstingets och kommunens utbud och service samt läkemedelsanvändning, år 2006 och 2007. Personerna i SG fick ett förebyggande hembesök av en distriktssköterska och personerna KG behandlades som vanligt.

RESULTAT

De flesta personer som var 75-år rapporterade sin hälsa som god eller mycket god men de rapporterade även problem med: smärta, sömn, minne, trötthet, förståelse för sin egen hälsa och sjukdomar, elimination, undervikt och övervikt. De som levde ensamma, de med folkskoleutbildning och kvinnor rapporterade sämre hälsa och välbefinnande än de som levde tillsammans med någon, de med universitetsutbildning och kvinnor *(studie I).* Vid uppföljningen rapporterade både de personerna i SG och KG en försämrad hälsa och välbefinnande och en ökning av läkemedelskonsumtionen. Emellertid visade det sig att problem när det gällde smärta, yrsel, trötthet och rörlighet var oförändrat i SG medan det hade blivit sämre i KG.

Personerna i KG rapporterade även en ökning av hälsoproblem i kategorin aktiviteter i dagligt liv (ADL). En majoritet av 75-åringarna rapporterade att de haft nytta av det förebyggande hembesöket *(studie II).*

SLUTSATS

Personerna som var 75-år upplevde god eller mycket god hälsa och välbefinnande samtidigt som de rapporterade många hälsoproblem. Studien bidrar till kunskap om hälsofrågor som rör personer som är 75 år och vad distriktssköterska bör vara medveten om när hon genomför förebyggande hembesök *(studie I).* Ett strukturerat förebyggande hembesök kan identifiera hälsoproblem (av vilka en del 75-åringar önskade hjälp med) såsom ADL, smärta, yrsel, trötthet och rörlighet. Dessa hälsoproblem var oförändrade i SG men hade ökat i KG. De förebyggande hembesöken hade ingen effekt på de 75-åriga personers levnadsvanor eller läkemedelskonsumtion. Både hälsofrämjande och sjukdomsförebyggande strategier är viktiga vid arbete med förebyggande hembesök eftersom många deltagare lever hälsosamt samtidigt som de har många hälsoproblem. De förebyggande hembesöken upplevdes som värdefulla av 75-åringarna *(study II).*

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Dialogue guide for Preventive Home Visits for 75-year-old persons **(Appendix 1)**

Date:

National Security Number:

Marital Status:

Living together with someone/living alone:

Social background Social networks, children Widow/widower	
Current caregivers, district physician, district nurse, other professions	
Social service or assistance	
Lifestyle Interests Exercise Habits Tobacco Alcohol	
Other relevant issues	

Assessment area	Self-care ability and/or health problems identified
Communication (difficult to speak, to hear, to see, to remember)	
Cognitive ability (e.g. information needs)	
Breathing/circulation (Respiratory/circulatory disorders, cough, dizziness, angina pectoris, swollen or cold feet, blood pressure)	
Nutrition (under/overweight, blood sugar levels, nutritional problems, nausea, difficulty swallowing)	
Elimination (problems with urine, faces, bowel function, intestinal)	
Skin/integument (changes and disorders of skin, itching, ulcer/wound, mucous membrane, dental health)	
Activity (problems with ADL and/or, mobility, physical, social and intellectual activity, living arrangement)	

Assessment area	Self-care ability and/or health problems identified.
Sleep (Sleep and rest e.g. chronic fatigue and weakness)	
Pain/perception (e.g. pain acute or chronic, vertigo, senses of a different kind)	
Sexuality/ problems with partner	
Cultural/spiritual	
Psychosocial (e.g. emotional, mood, sadness, anxiety, relationships, loneliness)	
Well-being and general assessment self-care ability, resources, self-rated health	
Composite assessment (e.g. present medication, problems with medication, side effects, interaction)	

Health and nursing care plan (the aim is to promote health, prevent diseases and/or maintain health

Health Resources _____

Health Risks _____

Health Problems _____

Nursing Diagnosis (OVD) _____

Nursing goal

1)

2)

3)

4)

Nursing intervention and Nursing outcome

1)

2)

3)

4)