

From the Department of Neurobiology, Care Sciences and Society
Division of Family Medicine and Primary Care
Karolinska Institutet, Stockholm, Sweden

**A CONTINUING EDUCATIONAL INTERVENTION
IN PRIMARY HEALTH CARE
USING THE CONPRIM MODEL**

Erika Berggren



Stockholm 2017

All previously published papers were reproduced with permission from the publisher.

Cover illustration: Jonas Burman Illustr AB.

Figure 3: SMAK DESIGN.

Published by Karolinska Institutet.

Printed by E-Print AB 2017.

© Erika Berggren, 2017,

ISBN 978-91-7676-812-9

A CONTINUING EDUCATIONAL INTERVENTION IN PRIMARY HEALTH CARE USING THE CONPRIM MODEL

THESIS FOR DOCTORAL DEGREE (Ph.D.)

By

Erika Berggren

Principal Supervisor:

Associate Professor DN Lena Törnvist
Karolinska Institutet
Department of Neurobiology, Care Sciences
and Society
Division of Family Medicine and Primary care

Co-supervisor(s):

Professor MD Peter Strang
Karolinska Institutet
Department of Oncology-Pathology
Stockholm Sjukhem Foundation's R&D

PhD RD Ylva Orrevall
Karolinska Institutet
Department of Learning, Informatics,
Management and Ethics
Karolinska University Hospital
Function Area Clinical Nutrition

PhD RN Ann Ödlund Olin
Karolinska Institutet
Department of Clinical Science, Intervention
and Technology
Karolinska University Hospital
Department of Quality and Patient Safety

Opponent:

Professor RN Albert Westergren
Kristianstad University,
Department of Health and Science
Division of School of Health and Society

Examination Board:

Professor MD Patrik Midlöv
Lund University, Faculty of Medicine
Department of Clinical Sciences, Malmö
Centre for Primary Health Care research

Professor DN Åsa Hörnsten
Umeå University
Department of Nursing
Division of Faculty of Medicine

Associate Professor RN Ingela Henoch
Gothenburg University
Department of Health Care Sciences
Division of Person-centred Care

To my mother and in memory of my father.

With love to my generous family: to Christer, my companion in life, and to Lasse and Lilian my children and forever loved ones. You always believe in me. You are my everything.

ABSTRACT

Background and aim: The overall aim of this thesis was to evaluate an intervention about “Nutritional care for patients cared for at home” developed using an interprofessional continuing educational model adapted for primary health care (ConPrim®).

Material and method: This thesis includes four studies, three quantitative and one qualitative. The source of the data for all studies was the subject-specific intervention developed using the three-part ConPrim® model (web-based program, practical exercise, case seminar). Each part is adapted to primary health care, interprofessional, and grounded in pedagogical theory. Participants were district nurses (DNs) and general practitioners (GPs). An intervention group (IG) and a control group (CG) was used. Study I evaluated the IG’s perceptions (n=67) of ConPrim® (as used in the subject-specific intervention) using a computer based questionnaire. Studies II and III evaluated the effectiveness of the intervention using a 32-statement, study-specific questionnaire about three topic areas. Study II evaluated effectiveness for both professions together (IG=87, CG=53) and presented the results for each topic area by statement. Study III evaluated effectiveness by profession (IG: DNs=48, GPs=39; CG: DNs=36, GPs=17), and presented the results by topic area. Study IV used grounded theory method to explore interactions between DNs and GPs during case-seminar discussions about nutritional care for patients cared for at home.

Results: In Study I, the professionals agreed that the ConPrim® model as applied in the intervention was suitable, the designs of the web-based program and case seminar were attractive, and they could use what they had learned in everyday clinical work. They found the time spent acceptable, with the exception of the practical exercise. In Study II, statistically significant effects were found in the inter-group analyses in 20 of the 32 statements: in all statements that assessed familiarity with important concepts and all statements about collaboration with other caregivers (except 2 of the 14 concerning level of knowledge). In Study III, the effectiveness of the intervention was measured by profession. It was significant for both professions in areas 1 and 2, but in area 3, it was significant for GPs but not DNs. Nevertheless, the total intervention effect ($p = 0.000 - p = 0.004$) was significant in all three areas. In Study IV, a theoretical model was constructed that describes how DNs and GPs negotiate the issue of responsibility for nutritional care via a uniprofessional dialogue (which does not lead to interprofessional learning) or an ongoing interprofessional dialogue (which under certain circumstances can lead to interprofessional learning).

Conclusions: The intervention developed using the ConPrim® model is promising. However, the instructions for the practical exercise should be clarified and the intervention adjusted to increase both professions’ level of knowledge about important aspects of nutritional care. The grounded theory model illuminates importance of the distinction between uni- and interprofessional dialogue; only the latter can lead to interprofessional learning.

Keywords: Caring, continuing interprofessional intervention, evaluation, home care, learning, model, nutritional care, palliative phase, patients, primary health care

LIST OF SCIENTIFIC PAPERS

This thesis is based on four papers, which will be referred to in the text by their Roman numerals.

- I. Berggren E., Strang P., Orrevall Y., Ödlund Olin A., Sandelowsy H., Törnkvist L. Evaluation of ConPrim®: a three-part model for continuing education in primary health care. *Nurse Educ Today* 2016; 46: 115–120.
- II. Berggren E., Orrevall Y., Ödlund Olin A., Strang P., Szulkin R., Törnkvist L. Evaluation of a continuing educational intervention for primary health care professionals about nutritional care of patients at home. *J Nutr Health Aging* 2016; 20: 428–438.
- III. Berggren E., Ödlund Olin A., Orrevall Y., Strang P., Johansson SE., Törnkvist L. Early palliative home care: Evaluation of an interprofessional educational intervention for district nurses and general practitioners about nutritional care. *SAGE Open Medicine* 2017, 5:2050312117726465.
- IV. Berggren E., Törnkvist L., Ödlund Olin A., Orrevall Y., Strang P., Hylander I. District nurses and general practitioners' negotiation of responsibility for nutritional care for patients with home care. Submitted.

CONTENTS

1	Background.....	2
1.1	Role of primary health care	2
1.1.1	Older people in need of home care	3
1.1.2	Professionals caring for older people at home	3
1.2	Continuing education in primary health care.....	4
1.2.1	A gap between knowledge and practice	4
1.2.2	Designing continuing educational interventions	5
1.3	Theoretical perspective.....	6
1.4	Rationale for the thesis	7
2	Aims.....	9
3	Material and methods	11
3.1	Study design	11
3.2	Setting and participants	12
3.3	The ConPrim® model	14
3.3.1	Development of ConPrim®	14
3.3.2	Description of the ConPrim® model.....	14
3.4	The ConPrim® model used in an intervention	17
3.4.1	Development of the intervention	17
3.4.2	Description of the intervention	18
3.5	Procedure	21
3.6	Data collection.....	23
3.6.1	Questionnaire evaluating the ConPrim® model (Study I).....	23
3.6.2	Questionnaire evaluating the intervention (Studies II and III)	23
3.6.3	Grounded theory methods (Study IV)	23
3.7	Data analysis.....	24
3.8	Ethical considerations.....	26
4	Main results	27
4.1	Professionals' background (Studies I-IV)	27
4.2	Evaluation of the ConPrim® model (Study I)	28
4.3	Evaluation of the intervention (Studies II and III)	29
4.4	Exploration of interaction in a case seminar (Study IV)	30
5	Discussion.....	32
5.1	Main findings.....	32
5.2	Methodological considerations	36
6	Implications for health care.....	39
7	Conclusions	40
8	Future perspective	41
9	Sammanfattning på svenska.....	42
10	Acknowledgements	45
11	References	47
12	Appendix	54

LIST OF ABBREVIATIONS

APC	Academic Primary Health Care Centre
ASIH	Advanced home health care
CG	Control group
CIPE	Continuing interprofessional education
ConPrim®	Continuing educational model for primary health care
DN	District nurse
FDR	False Discovery Rate
GP	General practitioner
GTM	Grounded theory method
IG	Intervention group
IPE	Interprofessional education
IPL	Interprofessional learning
KI	Karolinska Institutet
MNA	Mini Nutritional Assessment
OR	Odds Ratio
PHCC	Primary health care center
WHO	World Health Organization

PERSONAL INTRODUCTION

More and more people are living at home even if they have several diseases, and many are older. As a result, the need for high quality and good home health care is increasing. I have been caring for patients in home health care in Stockholm since the early 1990s, first as a nurse and then as a district nurse in primary health care and advanced home health care. During this time, I began to reflect that even though we as health care professionals provide good care, patients' needs are not always met.

My interest in improving care for patients and in continuing education for health care professionals led me to begin a series of workplace meetings where we discussed scientific articles relevant to our work. In keeping with this interest, in the early 2000s, I became an adjunct clinical instructor, supervising students who would become nurses, physicians, occupational therapists, physical therapists, and more, and leading them in interprofessional reflection groups after joint home visits to patients in home care.

Stockholm County Council's Health and Medical Care Administration (*Hälso- och sjukvårdsförvaltningen*) asked the Continuing Educational Unit at the Center for Family and Community Medicine (now the Academic Primary Health Care Centre) to provide continuing education in palliative care and nutritional care for professionals in primary health care, and I was asked to act as health care development leader for the project. We put together a multiprofessional group with expertise in nutritional care, palliative care, and primary health care. The group quickly realized that the continuing education needed to be interprofessional and that it had to be fitted to the special challenges that primary health care professionals face in participating in continuing education. We also saw the need to develop and evaluate the project scientifically, and it was this need, as well as my great interest in the topic, that led me to become a doctoral student. We thus sought and obtained special funding for the academic portion of the project.

These doctoral studies have given me new knowledge and a deeper understanding of clinical research. My interest in improving care for patients remains unabated, and I look forward to continuing my research.

1 BACKGROUND

The World Health Organization (WHO) states that one of the most important challenges for the public health care system is the gap between what is known from research and what is actually done to solve basic health care problems [1, 2]. This gap can lead to problems in caring for patients, including people who are older and severely ill. According to the Swedish National Board of Health and Welfare, such problems include shortcomings in competence and the quality of care provided [3]. Nutritional care for patients in a palliative phase is one area in which there is an important gap between what is known and what is done in primary health care, an organization with a broad mission and complex challenges. One key to filling the gap is appropriate continuing education.

1.1 ROLE OF PRIMARY HEALTH CARE

According to WHO, primary health care is care located in the community, as close as possible to where people live and work. It is usually delivered by family doctors, community nurses, and other health care professionals at local primary health care centres [4]. The goal of primary health care, “better health for all,” was expressed in the international declaration of Alma-Ata nearly 40 years ago [5]. This 1978 declaration describes primary health care as the centre of a country’s health care system. People’s initial contact with the health system typically occurs via primary care, the first element in the chain of care. It should be a scientifically sound level of care characterized by easy access; equal care for everyone; individual, family, and community participation; and use of appropriate technology. In 2008, 30 years later, WHO considered primary health care more important than ever and stated that it should be patient-centred, carried out by teams of professionals with adequate skills, and provided with sufficient resources and funding [4]. To meet teamwork and skill-related goals, primary health care professionals need up-to-date knowledge and should have the possibility to “learn together to work together for better health” via continuing interprofessional education (CIPE) [6].

The Swedish health care system is committed to guaranteeing health for all citizens and is a cornerstone of the Swedish welfare state. The 2017 Health and Medical Services Act calls for equal access to services and health for all via care provided on the basis of individuals’ needs [7]. Municipalities and county councils play an important role in the health care system, as do hospitals and primary health care centres (PHCCs). Patients’ visits to PHCCs, together with primary health care professionals’ visits to patients in their homes, make up approximately half of all patient contacts with the health care system [4]. Basic home health care; i.e., long-term health care delivered in the patient’s home or equivalent [8], is often the responsibility of the municipality but sometimes (as in Stockholm County) of the primary health care system.

1.1.1 Older people in need of home care

The older population is growing worldwide [4, 9]. Statistics Sweden estimates that by 2050, a quarter of the Swedish population will be 65 years or older [10]. A longer life brings many positive opportunities for older people, their families, and society [9]. However, older people may need support to maintain active lives and well-being [11]. Moreover, the percentage of older people with chronic diseases is increasing, which means that many have complex health care needs and thus need home health care [12].

Older patients who need home health care can be in the early or late palliative phase, and care needs differ by phase. Patients in the late palliative phase have advanced illness, experience complex symptoms, and are treated by specialized palliative home care teams or palliative care inpatient units [13]. In the early palliative phase, which can last for years, patients often are cared for by primary health care professionals working with basic home care [11, 14].

Older patients with home health care often have chronic diseases, impaired mobility, and varying degrees of cognitive difficulty [12]. Common health problems include cardiovascular diseases such as heart failure and poor circulation, chronic obstructive pulmonary disease (COPD), and cancer [15]. Patients with these problems are often frail, have complex needs [14, 15], and benefit from early palliative care [16].

1.1.2 Professionals caring for older people at home

According to the Health and Medical Services Act (2017:30), patient care should be based on the best available knowledge; built on science and evidence; and be safe, individually tailored, equal, accessible, and efficient [7]. Patients who are older need care from professionals who have up-to-date competence and can work in teams [12, 13]. A multiprofessional caring approach is important to successfully support patients' care needs; for example, to identify and alleviate eating difficulties and risk for undernutrition [17, 18] and to help ensure safe medication management [18]. A prerequisite for teamwork is interprofessional collaboration, a patient-centred approach to health care in which interaction maximizes the skills and strengths of each professional to contribute to the best possible quality of patient care [6].

Many of the professionals who work with basic home health care are District Nurses (DNs) and General Practitioners (GPs). In Sweden, DNs are specialist nurses whose four-and-a-half years of university-level education includes over a year of specialist training after licensing. DNs play an integral part in the Swedish health care system and can work at their own practice, for municipalities and/or primary health care centres, in patients' homes, and at schools [8, 19]. They strive to meet patients' individual needs, be aware of patients' experiences of illness, and support patients' health and well-being. In caring for patients, DNs' goal is to ease patients' symptoms and meet their needs in diverse ways. They support health by providing lifestyle advice, recommendations, and education [19]. DNs can prescribe incontinence aids and certain medicines [20], and in the Stockholm County Council area, oral nutritional supplements.

GPs are physicians who have specialized in family medicine. Their education takes 12 years, of which specialization takes 5 years and occurs after licensing. GPs often work as family physicians [21, 22] for patients of all ages and may follow patients over long periods of time. They are responsible for independently assessing patients' general health status, conducting investigations, setting diagnoses, and treating everything from minor health complaints to complex chronic diseases. In this work, GPs take into account individuals' overall life situations and health care needs [23].

1.2 CONTINUING EDUCATION IN PRIMARY HEALTH CARE

1.2.1 A gap between knowledge and practice

Nutritional care for patients with home health care is one area in which there is a clear gap between evidence-based knowledge and clinical practice [17, 24]. Home health care professionals do not always recognize and provide care for patients' nutritional problems [17, 25, 26], which can lead to unnecessary suffering for patients and their families, involving physical, psychological, social, and existential consequences [13, 27]. Patients can lose weight and muscle [28] and can therefore experience reduced strength and increased risk of falls [29]. Wound healing can slow [30], and patients can become more susceptible to infections [31], pressure ulcers, depression [32], and fatigue [33]. Patients can also experience feelings of loneliness [33] and may change their lives because of illness, including their plans [34] and their interactions with other people, and thus begin to feel existentially isolated [35].

To relieve suffering and help patients and their families experience security and symptom control, it is important for health care professionals to recognize the symptoms of nutritional problems early and to assess patients' nutrition-related needs and preferences [18, 36]. They need to be familiar with concepts important in caring for patients at home, such as the broader definition of palliative care. This definition includes not only patients about to die from a life-threatening illness, but also those with chronic diseases [37, 38] who are in a palliative phase for many years [13, 39]. It is important to differentiate between the early and late palliative phases because the goal of nutritional care differs by phase [11, 13]. Furthermore, professionals should know the responsibilities of DNs and GPs in nutritional care, work in teams, and collaborate with other caregivers and those close to the patients. They should also understand the causes and consequences of patients' nutritional problems and the importance of good nutritional care for patients' well-being [18].

Guidelines and general evidence-based knowledge on nutritional care for patients in a palliative phase exist. However, there does not seem to be an action plan to improve the quality of care that is tailored specifically for professionals who work with home health care [40, 41]. Studies show that effective educational training methods for professionals working in other forms of care have positive effects on patients' nutritional status [42, 43]. In primary health care, however, there are few studies on effective educational training methods, especially regarding nutritional care.

The nutritional problems of patients with home health care may go unrecognized for several reasons. For instance, there is a lack of systematic procedures for measuring patients' risk for undernutrition [17, 29]. Moreover, previous studies show that primary health care professionals have insufficient knowledge about nutritional care [30, 31]. Professionals can also be unsure about their roles and responsibilities related to nutritional care [44, 45], and teamwork can be lacking [46].

1.2.2 Designing continuing educational interventions

In 2011, the Swedish National Board of Health and Welfare set aside project funding to help achieve the goal of improving nutritional care for patients who are chronically ill [18]. The Academic Primary Health Care Centre in Stockholm was charged with creating a continuing educational intervention that would reinforce primary health care professionals' existing knowledge and help them gain new insight into the subject.

The development and implementation of the intervention had to take into account and overcome a number of challenges. First, primary health care professionals seem to have difficulty attending continuing educational programs [47, 48]. Reasons include high work load [48, 49], lack of time, and financial barriers [47], as well as lack of support from managers [50]. They may also need to travel long distances to reach places where educational offerings are held [48, 51-53]. In addition, the cases used in educational offerings may not always reflect the cases of the patients they meet in practice [54]. Furthermore, there is a lack of opportunities for both interprofessional learning [6] and achieving a deeper level of understanding that enables collaboration and improves practice [55].

A literature review was conducted to find continuing educational models for primary health care professionals, particularly models that were interprofessional. The search process employed Medical Subject Headings (MeSH) terms or keywords in the title/abstract. Keywords used covered the topics of primary health care, interprofessional education, and continuing educational models. The resulting studies were critically appraised to determine whether the educational interventions or models were adapted to primary health care circumstances, and if so, how. Three articles were about primary health care and IPE. One outlined a framework for constructing teaching models using principles of adult learning, problem-based learning, and role-playing exercises, although a specific pedagogical method was not clearly described [56]. Another was about IPE for nursing and medical students in rural areas [57]. The intervention promoted teamwork, but no clear description of an educational model was provided, and it was not clear how the developers evaluated the project. The third article was a reflective essay by an educator who described web-based distance-learning programs as useful in nursing education and potentially useful in continuing education for community practice professionals [58]. No intervention or model was described, but the proposal was based on constructivist educational theory. The literature search thus identified no studies of CIPE interventions that were adapted in a specific way to primary health care professionals' needs and no models that could be used to develop the CIPE intervention about nutritional care for patients cared for at home.

1.3 THEORETICAL PERSPECTIVE

At its core, caring is about taking the patient's perspective into account to alleviate suffering and support the patient's experience of health and well-being during illness [13, 59-63]. A caring perspective (a caring ontology) is not limited to any profession, such as DNs or GPs.

Two different epistemological approaches, a more humanistic (e.g., caring science) and a more positivistic (e.g. "classic" medical science) can be used to develop health care knowledge. These two approaches, which are appropriate for answering different kinds of research questions, can complement each other [60, 64].

Research on caring can be conducted via caring science, a traditionally humanistic, holistic approach to developing knowledge that aims to understand patients' perspectives; e.g., to understand a patient's experiences of his or her symptoms. The Nordic tradition of caring science has inspired health care research, education, and clinical development since the 1990s. Three major theorists (Katie Eriksson, Kari Martinsen and Karin Dahlberg) from the Nordic tradition have provided different yet complementary perspectives on caring research and how to apply its results in practice [60]. Research on care can also be conducted via a more positivistic approach that aims to generate objective results and facts [60, 64]; e.g. to explain the physical reasons for a patient's symptoms. Health care professionals often combine knowledge from both approaches to meet patients' needs and provide good care [60, 64, 65].

In order to provide good care, primary health care professionals need continuing educational interventions that incorporate a caring perspective. They also need interprofessional learning (IPL) so they are practice-ready and can work in teams [6, 66]. Interprofessional learning is learning arising from interaction between members of two or more professions and may be achieved spontaneously in the workplace [67, 68] or in IPE, education in which professionals learn about, from, and with each other [6]. Theories of IPE state that it is important to achieve deeper levels of understanding and that the responsibility for learning should be shared by the team and each individual [69]. Studies show that IPE can lead to shared understanding; improved awareness, communication, and collaboration; and improved health care outcomes for patients [6, 70, 71].

If learners are to achieve the deep level of understanding needed to apply their knowledge in their caring practice, educators must choose appropriate pedagogical methods when they design educational interventions [55, 72]. Additionally, when educational interventions are developed using concepts and theories that are grounded in research, learners can construct knowledge through their interactions and activities [60, 72].

One influential theory that can be used to design educational interventions is constructive alignment. Constructive alignment, developed by educational psychologist John Biggs [73], helps educators create courses, programs, models, and more in which learning objectives, activities, and assessments work together to help learners achieve a deeper level of understanding. Constructive alignment is inspired by constructivist theory, which posits that

learners actively move from basic factual learning through a variety of stages to the ability to integrate what they have learned and apply it in real-life situations such as clinical practice.

Constructive alignment employs the Structure of the Observed Learning Outcome (SOLO) taxonomy [73], which consists of five sequential levels of learning. Each level of the SOLO taxonomy is accompanied by a set of verbs that helps educators plan learning objectives so that learners achieve the appropriate level of knowledge. Learners progress successively through each level, moving from basic quantitative acquisition of facts (levels 1 to 3) to qualitative integration of what they have learned and the ability to apply their knowledge in practice (levels 4 and 5).

1.4 RATIONALE FOR THE THESIS

The older population is growing, and with it, the proportion of people with chronic diseases and complex health care needs, many of whom need home care. They also might have palliative care needs. Primary health care professionals, including DNs and GPs, play a crucial role in providing home health care for these people. To achieve best practice and the best possible care and well-being for older patients, professionals need to work in teams. Teamwork is not always optimal, though, despite its importance. Professionals also need to regularly update their knowledge, particularly given the rapidity with which research-based knowledge and understanding are changing and accumulating. However, they do not always have the opportunity to do so. This is an important reason for the gap, described by WHO, between what research shows should be done in practice and what is actually done. One key to maintaining up-to-date knowledge is adequate continuing education. Continuing education for primary health care professionals should be tailored to their specific circumstances and needs. The design and content of the education should be interprofessional, promote teamwork, be relevant to practice, and ease participation. To enable professionals to achieve the deep level of understanding needed to affect everyday practice, it should also be based on pedagogical theories.

Care for older patients with nutritional problems is an important subject in which there is a gap between research-based knowledge and clinical practice. This gap leads to unnecessary suffering for patients and those close to them; for example, when patients with nutritional problems are not identified and assessed in accordance with research-based knowledge and practice. As part of an initiative to improve nutritional care for older people, the Academic Primary Health Care Centre (APC) in Stockholm was asked to educate primary health care professionals (DNs and GPs) in nutritional care. A search thus was undertaken for continuing educational models that met the special needs of primary health care, but no suitable model or intervention was found. There was therefore a need for a model that could be used to develop the requested educational intervention, and if evaluations showed that it was effective, to develop interventions in additional subject areas.

2 AIMS

2.1 OVERALL AIM

The overall aim of this thesis was to evaluate an intervention about “Nutritional care for patients cared for at home” developed using a continuing interprofessional educational model adapted for primary health care (ConPrim®).

2.2 SPECIFIC AIM

The specific aims of this thesis were to:

- evaluate professionals’ perception of the design, pedagogy, and adaptation to primary health care of the ConPrim® continuing educational model as applied in the subject-specific interprofessional educational intervention, “Nutritional care of patients cared for at home” (Study I).
- evaluate the effectiveness of the intervention in improving professionals’ familiarity with information important to nutritional care in a palliative phase, their collaboration with other caregivers, and their level of knowledge about important aspects of nutritional care (Study II).
- evaluate, by profession, the effectiveness of an interprofessional educational intervention for district nurses (DNs) and general practitioners (GPs) on three areas of nutritional care for patients in a palliative phase (Study III).
- explore district nurses and general practitioners’ interaction in a case seminar when discussing nutritional care for patients cared for at home and construct a theoretical model illuminating the professionals’ main concern (Study IV).

3 MATERIAL AND METHODS

3.1 STUDY DESIGN

This doctoral thesis comprises four studies about ConPrim®, a three-part model for continuing education in primary health care, and about a subject-specific intervention designed using the model. The source of the data for all four studies was the subject-specific intervention, which included DNs and GPs and had an intervention group (IG) and a control group (CG). In Studies I and IV, data from the IG were used, whereas in Studies II and III, data from both the IG and CG were used. Studies I, II, and III were quantitative in design, and Study IV was qualitative.

Study I evaluated the IG's perceptions of the ConPrim® model with a computer based questionnaire. Studies II and III evaluated the effectiveness of the intervention, which was about nutritional care for patients in a palliative phase living at home. These two studies (II and III) analysed the results of a study-specific questionnaire that consisted of 32 statements about three topic areas. Study II evaluated the effectiveness of the intervention (DNs and GPs together). The results for each topic area were presented by statement. Study III evaluated effectiveness by profession (DNs and GPs separately), and the results were presented by topic area. Study IV used grounded theory method (GTM) to focus on interactions between DNs and GPs during case-seminar discussions in the third part of the intervention.

Table 1. Overview of the four studies in the thesis.

	Study focus	Design	Participants	Data collection	Data analysis
I	Evaluate professionals' perceptions of the ConPrim® model applied in an interprofessional continuing educational intervention	Quantitative	67 professionals	Questionnaire evaluating the ConPrim® model	Descriptive statistics
II	Evaluate the effectiveness (for professionals) of an interprofessional continuing educational intervention designed using ConPrim®	Quantitative	Intervention group: 87 professionals Control group: 53 professionals	Questionnaire evaluating the intervention	Descriptive and analytical statistics
III	Evaluate the effectiveness (by profession) of an interprofessional continuing educational intervention designed using ConPrim®	Quantitative	Intervention group: 48 DNs and 39 GPs (n=87) Control group: 36 DNs and 17 GPs (n=53)	Questionnaire evaluating the intervention	Descriptive and analytical statistics
IV	Explore DNs and GPs' interactions in a case seminar (last part of ConPrim®) in which they discuss nutritional care	Qualitative	87 professionals	Eight inter-professional case-seminar discussions	Grounded theory methodology

Abbreviations: DN, district nurse; GP, general practitioner

3.2 SETTING AND PARTICIPANTS

3.2.1 Setting

Participants in this individual-level study were recruited from primary health care centres (PHCCs) in Stockholm County. In 2011, there were 196 PHCCs in the Stockholm County Council. About 800 nurses/district nurses and 1100 physicians/general practitioners, hereafter referred to as professionals or as district nurses (DNs) and general practitioners (GPs), worked at these PHCCs.

3.2.2 Participants

Figure 1 shows the flow of participants through the intervention study. The intervention group (IG) and control group (CG) were recruited from the 189 PHCCs in the county that were included in a Stockholm County Council electronic database. All DNs and GPs who worked with home care were eligible for inclusion in the study.

Intervention group: In order to recruit the DNs and GPs, the managers of the PHCCs were contacted via email about the study. The managers and professionals at the centres were provided with information about the study. After two email reminders, the managers of ten PHCCs agreed to give the DNs and GPs working at the centre the opportunity to participate. PHCCs were compensated for three hours of the time professionals spent on the intervention.

Of the 114 professionals who expressed interest in participating in the IG 101 answered the questionnaire at baseline and 93 received the questionnaire at follow up. Finally 87 professionals were included in the study. Sixty seven out of the 87 professionals in the IG completed the questionnaire evaluating the ConPrim® model (Study I). In total 87 (76%; 48 DNs and 39 GPs) took part in the intervention and completed the questionnaire evaluating the intervention at both baseline and follow-up (Study II and III). The last part of the intervention was a case seminar which was held nine times for 93 professionals. Eight of these nine seminars were audiotaped (87 professionals, 6-16 per case seminar) and included in study IV.

Control group: The CG was recruited from the PHCCs in the Stockholm County database that did not participate in the IG. Forty-six randomly selected PHCCs were contacted to recruit individual professionals to the CG. Managers, DNs, and GPs at these centres were again sent information about the study, this time with an invitation to participate in the control group. They were also offered the continuing educational intervention after the end of the study. Of the 85 who expressed interest in participating in the CG, a total of 53 professionals (62%; 36 DNs and 17 GPs) from 32 PHCCs took part, completing the questionnaire twice; the second occasion was one month after the first (Study II and III).

Drop out from the intervention study: Examples of reasons for dropping out of either the IG or the CG included insufficient time to participate and change of workplace. More professionals dropped out of the CG (38%) than the IG (24%).

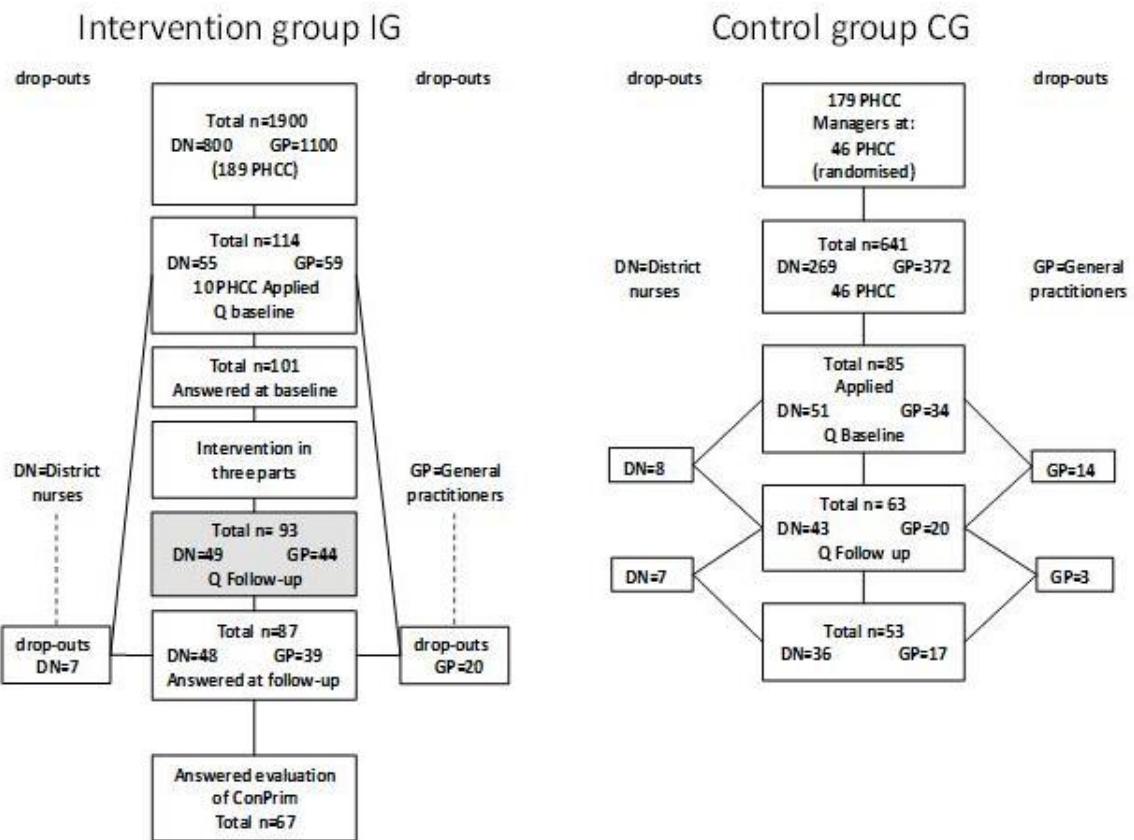


Figure 1. The flow of participants in the IG and the CG in the intervention study
Q=questionnaire

3.3 THE CONPRIM® MODEL

3.3.1 Development of ConPrim®

To meet the needs described in the background section, a multiprofessional research group developed the ConPrim® model. The group consisted of a registered dietitian, a registered nurse, two DNs, a general practitioner, and a physician who is a professor in palliative care. Together they brought a broad range of experience to the project, including experience in clinical primary health care, home care, nutritional care, palliative care, research, pedagogy, and developing continuing education in primary health care. Additionally, the group consulted three pedagogical experts for feedback on the design of the model.

The first need the group tried to meet was the need for education adapted to the specific circumstances of primary health care professionals, such as the difficulty that professionals face in participating in continuing education and the importance of education that is clearly relevant to professionals' everyday work. The second was a need for teamwork and collaboration in primary health care. The third was the need for professionals to achieve a level of understanding deep enough to enable them to use their new knowledge in everyday practice.

When building the model, the research group chose to follow the principles of constructive alignment, a pedagogical theory developed by John Biggs [74] in the 1980s for use in higher education. This decision was in accordance with the Framework of the Bologna Process for ensuring the quality of higher education in European countries [75].

3.3.2 Description of the ConPrim® model

On the basis of the needs described above, the research group developed the three-part ConPrim® model. The model consists of a web-based program, a practical exercise, and a case seminar discussion, all based at the professionals' workplace.

Part 1 of ConPrim®

Part 1 of ConPrim® consists of a web-based program. At the beginning of the program, evidence-based facts about the subject are provided in an illustrated, printable PDF that includes a list of relevant scientific literature, references, and links. Next, each participant completes the interactive section of the web-based program. This section is about a patient case. Drawings illustrate the key issues in the case, and throughout this section professionals assess and develop their knowledge via interactive multiple-choice questions.

Adaptation to primary care: Professionals complete the program at their own workplace and at their own pace, stopping and starting as needed. The patient case illustrated in the web-based program is created with information about real patient cases that is obtained from interviews of primary health care personnel.

Interprofessional education: All facts and illustrations are presented from the perspective of each target professional group. The program provides examples that illustrate the responsibilities of each participating profession and interprofessional collaboration. The multiple-choice questions reflect the responsibilities of all relevant professional groups.

Pedagogical theory: The web-based program that constitutes part 1 of ConPrim® is designed to help professionals reach SOLO taxonomy levels 2 and 3 (Figure 2). That is, it concentrates on providing fact-based information.

The three parts of ConPrim® ¹	Constructive alignment		
	SOLO ² taxonomy levels	Intended learning outcomes (verbs)	Teaching/learning activities and assessment tasks
1. Web-based program	2 and 3	Identify, combine	Theoretical education on web with interprofessional component, case-based exercise (read about facts, follow a patient case combined with answering interactive multiple-choice questions)
2. Practical exercise	3 and 4	Describe, discuss	Practical exercise with interprofessional component: nurse uses Mini Nutritional Assessment at home visit and describes and discusses results with the physician. Nurse and physician take any action necessary
3. Case seminar	4 and 5	Relate, solve, reflect	Case seminar facilitators hold educator-facilitated case seminars with interprofessional component: read cases, reflect on and solve an authentic case in a case-seminar discussion

¹ConPrim® = Continuing educational model for primary health care professionals

²SOLO = Structure of Observed Learning Outcome

Figure 2. The relationship between the three parts of ConPrim® and the parts of the constructive alignment.

Part 2 of ConPrim®

Part 2 of ConPrim® is a practical, patient-centred exercise. In the first section of the exercise, professionals apply the fact-based knowledge they learned from the web program to complete an activity. In the second section, they discuss the outcome of the activity with members of the other participating professions, and as appropriate, document decisions and actions.

Adaptation to primary care: The exercise takes place at the professionals' own workplace and involves caring for patients in primary care.

Interprofessional education: In the practical exercise, members of the participating professions discuss whether further caring actions are needed for the patients, and if so, take these actions in consultation with the patients.

Pedagogical theory: The practical exercise is intended to help professionals achieve SOLO taxonomy levels 3 and 4. At these levels, professionals should be able to describe and discuss the outcome of the exercise.

Part 3 of ConPrim®

Part 3 of ConPrim® is based on case learning methodology [76]. Case methodology uses authentic cases and events written from the perspective of a specific profession. Participants discuss the case in a facilitator-led learning activity called a case seminar in which they collaborate to develop solutions to the real-world problems described in the case. There is no right, wrong, or easy answer to the case, and the discussions should be analytical and open-ended.

In ConPrim®, the case seminar is based on an authentic case from primary health care, and the discussion is led by facilitators who are members of the same professions as the participants. The facilitators' task is to encourage and support reflective, analytical discussions and collaboration among the professionals as they solve the case.

Adaptation to primary care: Those familiar with case methodology conduct interviews with primary health care professionals who are members of the participating professions. They gather information about an authentic patient case and use it to write the seminar case. Additionally, the case is held at the professionals' workplace.

Interprofessional education: The case is written from the perspectives of two participating professions. Before the seminar, professionals read the case that is written from their own professional perspective. Then, at the seminar, they read the case again, but from the perspective of another participating profession. Finally, all participants discuss the case and collaborate to solve it.

Pedagogical theory: The case seminar is intended to help professionals achieve SOLO taxonomy levels 4 and 5. At these deeper, qualitative levels of understanding, professionals should be able to combine previous and newly acquired knowledge to reflect on and solve problems [73].

3.4 THE CONPRIM® MODEL USED IN AN INTERVENTION

3.4.1 Development of the intervention

The multiprofessional research group used the ConPrim® model to develop the educational intervention “Nutritional care for patients cared for at home.” Because the intervention was based on ConPrim®, each of the three parts was adapted to primary health care in the ways described in the text about the ConPrim® model, was interprofessional, and was grounded in pedagogical theory. The subject-specific contents of the final educational intervention are described in detail below.

EB began by searching in the literature to identify the best available scientific knowledge about the subject, including core caring concepts such as health and well-being [13, 61-63]. The facilitators (EB and HS) also interviewed DNs and GPs to understand these professionals' learning needs. They created appropriate intended learning outcomes (common for both DNs and GPs): identify nutritional problems among patients in the early and late palliative phase, describe and discuss patients' nutritional problems, relate one's roles and responsibilities regarding the care for patients with nutritional problems cared for at home to the roles and responsibilities of others, and reflect and link new knowledge with one's own experiences to solve the patients' nutritional problems.

The typical case used in the web-based program was developed by the research group. The facilitators interviewed DNs and GPs about their experiences of caring for patients in home health care. They then created the typical case on the basis of the results.

For the case seminar discussions, the two case seminar facilitators created an authentic case in accordance with case methodology [76-78], taking into account the perspectives of the two participating professions. Both facilitators had experience in primary care and training in case methodology. One was a DN (EB) and the other a GP (HS). To create the case, EB spoke with a number of DNs to identify a nurse who was caring for a patient who experienced chronic illness. After obtaining the nurse's informed consent, EB interviewed the nurse and wrote the case from the DN's perspective. HS then identified the GP who was jointly responsible for the home health care of the same patient. After obtaining informed consent, HS interviewed the GP and wrote the case from the GP's perspective.

Pilot test: The ConPrim® model as applied in the subject-specific intervention was pilot tested in three steps.

First, the web-based program was tested by four professionals (two physicians and two nurses) working in home health care. They completed the program and used a scale from one to five to answer eight questions. The questions concerned how satisfied they were with the program's usefulness, user-friendliness, attractiveness, content, and performance; how beneficial they thought the knowledge would be to them in their practice; their general impression of the program; and the degree to which they thought they had learned something

new. The results lead to minor modifications of the web-based program: more illustrations were added, texts were shortened, and the size of the font was reduced.

Second, the questionnaire evaluating the intervention was pilot-tested by six DNs and two GPs via a think-aloud test, a cognitive interviewing method [79, 80]. In this method, as the professional completed each question, he or she thought out loud about how easy or difficult it was to read and comprehend. EB sat beside the professional, taking notes on what he or she said. Two statements were adjusted and the think-aloud test repeated with a new DN and GP. No additional changes were required.

Third, the entire intervention developed using the ConPrim® model (the web-based program, practical exercise, and case seminar) was pilot tested by six other professionals (two physicians and four nurses) who worked at a PHCC and who also worked with home care. After the intervention, they completed a study-specific questionnaire developed by the research team and intended to evaluate the model as applied in the intervention. The initial questionnaire consisted of 12 positive statements. The professionals were asked the degree to which they agreed with these positive statements. All professionals fully or mainly agreed with almost all the statements; the exception was one statement, with which one person partly agreed. No changes were made to the intervention after this pilot test. However, three statements in the questionnaire concerning sound, images, and whether the professionals had finished the web-based program in one sitting were excluded from the final version of the questionnaire.

As part of the evaluation of the entire intervention, an expert in case-seminar methodology evaluated the quality of the case seminar. She observed the seminar and gave oral and written feedback to the seminar facilitators. In response to this feedback, instead of using brainstorming to support the discussion during the case seminars, the research team chose to use three themes to give assistance for the discussions if needed: "responsibility," "team work," and "nutritional care of patients in a palliative phase."

3.4.2 Description of the intervention

All three part of the final educational intervention were to be performed within one month. The intervention covered [11, 13, 18, 81, 82]:

- Concepts important in palliative care
- Patients' nutritional problems and needs
- Nutritional care in the early and late palliative phases
- Responsibilities of DNs and GPs
- The importance of teamwork and collaboration with other caregivers
- Causes and consequences of patients' nutritional problems
- Consequences of good nutritional care in the early palliative phase

Part 1 of the intervention

Part 1 of the intervention consists of a web-based program that starts with a printable PDF that provides evidence-based facts about nutritional care for patients living at home. The program continues with an interactive, question-and-answer section about a patient in primary health care with several chronic diseases. The case is described from the perspectives of the DN and the GP. Professionals had a week to complete the web-based program, which took about one hour.

The typical case follows a patient's story, beginning when she is enrolled in basic home care and continuing through her experiences in the early and late palliative phases. She has nutritional problems and is at risk of undernutrition. A DN and a GP work as a team with the patient, her son, and other caregivers (e.g., home help services) to meet her needs. Her condition worsens, and the team members must communicate with the patient and her son about critical transition points in the continuum of care. She wishes to die at home, and her care is arranged in keeping with this wish.

Part 2 of the intervention

In Part 2 of the intervention, the practical exercise, DNs were asked to identify patients who lived at home, who were in the early palliative phase, and who were enrolled in the DNs' home care area. Together with the patients, the DNs were to complete the Mini Nutritional Assessment tool (MNA) [83] and three other instruments about nutrition that were not included in this thesis. The MNA [84] identifies people's nutritional problems and those who are at risk of undernutrition or who are undernourished. The DN was then to discuss the results of the MNA with the GP at their workplace. In collaboration, the two professionals were to take any actions they agreed were needed, such as a care plan meeting with the patient and other relevant caregivers. Participants had two weeks to complete the practical exercise, which took about one and a half hours.

Part 3 of the intervention

The third part of the intervention was a case seminar at the primary health care professionals' workplace. The case seminar took about an hour and a half and was performed approximately one week after the practical exercise. The following is a short summary of the case. Note that the authentic case used in the case seminar was presented in the form of two documents, one written from the perspective of a district nurse and the other from the perspective of a general practitioner [85].

The case is about “Aina,” a woman in her 80s living alone in Stockholm’s old city. She is thin and frail because of bad rheumatism, which has given her misaligned joints. She is in a great deal of pain, both from the rheumatism and pressure sores. Aina has round-the-clock help from home help services and has clearly expressed her wish to avoid hospitalization and to die at home.

The case description starts when Ingrid becomes Aina’s district nurse. Aina experiences a great deal of suffering and spends most of her time in bed. Ingrid makes sure that a copy of Aina’s home care plan is available in Aina’s living room. Because morphine is disappearing from Aina’s pill organizer (*dosett*), Ingrid begins delivering the medication daily rather than weekly. To improve Aina’s bedsores and protect her fragile skin, Ingrid makes sure that Aina gets an air mattress. She also sees to it that Aina’s night-time home help service group is changed when it is discovered that Aina has developed large bruises because the group is not following the care plan. Additionally, Ingrid finds out that Aina does not like the packaged food she receives and makes sure that Aina receives help with cooking food that she prefers. She also makes sure that Aina gets a walking aid.

In the meantime, Aina’s general practitioner, Margit, also visits Aina whenever Ingrid asks her to. Ingrid and Margit believe they collaborate well together. However, Ingrid only asks Margit to visit when Aina’s condition worsens, and Margit does not volunteer to visit at other times. Instead, she feels comfortable leaving all other home health care to Ingrid.

Because of Ingrid’s caring interventions and the antibiotics Margit prescribes, Aina’s pain diminishes, her bed sores heal, and her health and well-being improve. She is able to get out of bed and eat in the kitchen daily. However, she is still frail, and when she catches a cold, her condition quickly worsens. She is bedridden, her appetite diminishes, and she is at risk for pneumonia. When the case description ends, Aina’s home help service personnel want to send her to the hospital and Ingrid and Margit are thinking about how to best support Aina and what to do next.

3.5 PROCEDURE

Each of the ten participating PHCCs selected a contact person for the study and provided this person's contact information to EB. Every contact person gave EB a list of IG participants, their profession, and their email addresses. EB and HS then sent all professionals in the IG an email describing the three parts of the intervention and providing them with a schedule and a link to the baseline questionnaire evaluating the intervention (Studies II and III). After filling in the baseline questionnaire, the IG automatically received a link to the web-based program, which they were to complete within a week.

Next, in preparation for the practical exercise, EB sent a package to the contact person at each PHCC. The package contained a list of DNs' names and email addresses and the code for each nurse. It also contained a coded envelope to be distributed to each DN with coded forms for use with up to four patients, including the MNA and three other forms about patients' nutritional situation. Coding was undertaken so that MNAs could be traced back to PHCC and nurse. The envelope also had written information about the practical exercise for the DN and written information for the patients. Finally, the envelope itself was addressed and stamped for use so that the completed forms could be sent to a secretary at the APC.

When the nurses conducted their next home visit, they asked the patient if he or she would be willing to participate in the study. If the patient agreed, the nurse provided the patient with the written study information and obtained their written consent. Together, the nurse and patient then completed the assessment forms. When all the visits were complete, the nurses used the pre-addressed, stamped envelopes to return all forms to the secretary.

Next, EB and HS emailed the case with the correct professional perspective to each professional. The professionals then participated in the case seminar, which was audio recorded and transcribed verbatim (Study IV). Before the facilitators started the audio recording, the professionals provided their written informed consent. One DN and one GP were facilitators and lead the seminar to stimulate the discussions when professionals tried to analyse and solve the case.

At the case seminar, the facilitators informed the professionals about the schedule for the afternoon and the idea behind the seminar. They emphasized the value of every opinion and the lack of a right or wrong way to approach the discussion. The facilitators also supported the discussion by asking open questions to encourage the professionals to share knowledge, identify dilemmas, and solve problems in different ways. Prior to the seminar, the professionals were asked to read the version of the case written from the perspective of their own profession. At the seminar, the participants were initially separated into groups by profession to discuss the case. After approximately fifteen minutes, the members of both professions gathered together, and each group described their earlier discussion. In the next step, the facilitators asked the professionals to read the case from the perspective of the other profession. When the participants had gathered again, the audio recorder was started. At this time, the seminar began with the question, "What is the case about now?" First, the

professionals were given a brief opportunity to comment spontaneously. Next, large-group discussions alternated with smaller buzz-group discussions. After each buzz-group discussion, the facilitators wrote the professionals' view of the dilemmas in red on a whiteboard. Then the facilitators asked for the solutions and wrote them in green. To stimulate analytical discussions, creativity, and problem solving, the facilitators used prompts such as "Can you tell us more?", "Can you see any difficulties with what you are saying?", "How does this line up with what he/she said?", "You mean that . . .", and "What do you others think about that?" The facilitators rounded off the discussion by asking "What will you take with you from today?" Each professional was given a chance to respond individually. Finally, the professionals had the opportunity to add final comments. The facilitators then turned off the audio recorder. After each case seminar, the facilitators reflected on the character of the discussions and wrote memos of things they should keep in mind for the next seminar.

After the case seminar, EB and HS emailed the follow-up questionnaire to each professional who had completed the baseline questionnaire and the intervention. After a few days, EB sent reminders to those who had not yet completed the follow-up questionnaire. As soon as each professional completed the follow-up questionnaire in studies II and III, they were automatically sent Study I's computer-based, study-specific questionnaire intended to evaluate the ConPrim® model upon which the intervention was based. This questionnaire did not request the professional's name or any other information that could be used to identify the person who completed it.

The control group, recruited later, was sent the baseline questionnaire, and then one month later, the follow-up questionnaire (Studies II and III), EB sent them up to two reminders as needed.

3.6 DATA COLLECTION

Data were collected via the two pilot tested computer-based, study-specific questionnaires developed by the multi-professional team (Studies I, II and III). Both questionnaires used the same four-alternative, Likert response scale, which ranged from “fully agree” to “do not agree at all.” In Study IV, GTM was used to both collect and analyse data.

3.6.1 Questionnaire evaluating the ConPrim® model (Study I)

The ConPrim® model was used to create the intervention “Nutritional care for patients cared for at home.” The model was evaluated by professionals who participated in the intervention via a computer based questionnaire. This questionnaire gathered information on the health care professionals’ perceptions of the model’s design, pedagogy, adaptation to the circumstances of primary health care, and self-reported subject-specific learning. Space was provided for comments.

3.6.2 Questionnaire evaluating the intervention (Studies II and III)

The final questionnaire evaluating the intervention had ten questions (4, in Study III) about the professionals’ backgrounds and additional 32 statements about three topic areas (see appendix I): 1) familiarity with information important to nutritional care in a palliative phase, 2) collaboration with other caregivers with regard to patients’ nutritional problems and needs, and 3) level of knowledge about important aspects of nutritional care for patients (in the early and the late palliative phase) as well as responsibility and teamwork in managing patients’ nutritional problems and needs.

3.6.3 Grounded theory methods (Study IV)

As GTM is particularly suited to examining social interactions in contexts that are not well-studied, it was considered a suitable method for exploring DNs and GPs’ interactions in a case seminar. GTM is a method that guides both the collection of data and the analysis of data. Here transcripts from 8 audio-taped case seminars were used. Kathy Charmaz describes grounded theory method from a constructivist and interpretive perspective and emphasises people’s views, actions, and beliefs. In this constructivist method, the researchers move beyond descriptions to construct a theory [86, 87]. Coding focuses on actions in data [86]. The coding proceeds from an initial and open coding, in which ideas and possible meanings are gathered from the data, through focused coding, in which meanings in and distinctions between categories are discovered. Theoretical coding leads the researcher to discover new patterns and finally construct a theoretical model grounded in data. The coding procedure and collection of data terminates when the researcher estimate that saturation is reached. It is import to write memos throughout the entire analytical process; as Charmaz puts it, memos are a way of “conversing with yourself” about new ideas and thoughts that gives them the opportunity to emerge.

3.7 DATA ANALYSIS

3.7.1 Studies I, II, and III (quantitative studies)

All three studies used ordinal scales with four response alternatives. Thus, non-parametric methods were used to analyse these data. Data were presented as medians, interquartile ranges, numbers, and percentages (Study I) and as mean ranks (Studies I-III). For pragmatic reasons, mean ranks are sometimes showed because medians might be a poor summary of the information when an ordinal scaled variable is used. In other words, mean ranks provide a more nuanced picture of the results than do medians. However, all tests used were for ordinal data.

In Studies II and III, differences in professionals' backgrounds at baseline were analysed with a variety of methods: 2-sample t-test with equal variance (age), Pearson's Chi²-test (sex and current profession), two-sample Wilcoxon rank-sum test (years worked with patients who had basic home health care), and Fisher's exact test (differences in continuing educational background at baseline and follow-up). In Study III, differences in proportions between DNs and GPs were assessed with Chi²-tests or Fisher's exact test. The significance level was set at $p < 0.05$ for analyses of background data.

In Study II, changes in responses to statements between baseline and follow-up were analysed with the Wilcoxon signed-rank test. Wilcoxon rank-sum test was used to determine whether there was an intervention effect. We also applied an ordinal logistic regression to measure intervention effects by estimating odds ratios (ORs). Ordinal logistic regression assumes that the relationship between each pair of outcome groups is the same. This means that the coefficients that describe the relationships between (for example) the lowest and all higher categories of the response variable are the same as those that describe the relationship between the next lowest category and all higher categories. This is called the proportional assumption. An approximate likelihood-ratio test of proportionality of odds across response categories was therefore used. All items satisfied this assumption.

In Study III, to analyse changes in DNs and in GPs between baseline and follow-up the Wilcoxon signed-rank test was used. To examine changes by profession in the IG and CG, both the Wilcoxon rank-sum test and ordinal logistic regression were used. This was done to assess the presence or absence of an intervention effect by profession. Differences in the intervention effects in DNs and GPs were analysed with ordinal logistic regression. (If interactions are significant, an intervention effect is present.) The intervention effect was tested by including the interaction between profession and time and also by using ordinal logistic regression to test the total intervention effect. Cronbach's alpha [88], which is regarded as acceptable if alpha is > 0.70 in each area [89], was estimated to test the internal consistency of the three topic areas in the questionnaire. Cronbach's alpha assumes that there is only one factor per area.

There are several ways to adjust p-values. One extreme is to do nothing [90]. The other extreme is to divide the nominal significance level by number of tests (M); e.g., α/M , the so-called Bonferroni correction. In between, we have the False Discovery Rate (FDR), suggested by Benjamin and Hochberg [91]. The FDR is calculated by dividing the number of rejected H_0 (when H_0 is true) by the total number of rejected H_0 . Because 54 tests were conducted, I chose to use the FDR [91], a less conservative choice than the Bonferroni correction, in order to adjust alpha, and significance was set at $p \leq 0.025$. Statistical Software: Release 14, StataCorp 2015 were used in the analyses.

Sample size was calculated on the basis of the results of an earlier study [92]. Both the questions and format were similar to those in the studies presented in this thesis. The main outcome of the previous study was treatment of undernutrition in older people living in Stockholm County who had home care. The calculations indicated that to detect a difference in means of 0.48 (standard deviation = 0.87) at a power of 80% (alpha = 0.05), I would need at least 30 professionals in the IG and 30 in the CG.

3.7.2 Study IV (qualitative study)

Initial coding: The empirical material was analysed in accordance with Charmaz's constructivist grounded theory method [86]. The analyses started with open, line-by-line coding of the first unit of analysis; i.e., a transcript of one case seminar in addition to the transcripts of the final minutes of all case seminars, when the group members summarized the discussion. From this initial coding, the first tentative categories were constructed in the form of a list of 23 categories (e.g., fend off, question) and 71 subcategories (e.g., change topic, agree). Open coding continued with the transcripts from 5 more case seminars. Incident was compared to incident and with the developing list of categories. Codes formed categories, and some categories could be explanatory subcategories. In parallel, the categories were compared with the data to maintain content that was close to the text. Whenever possible, the coding was done using gerunds; the aim was to keep the wording close to the data and to illustrate actions [86]. This coding led the researchers to discover new distinctions between categories. Those categories that seemed most important and those that emerged repeatedly were identified as focused codes. Focused coding started when the list of categories had developed into a more congruent set of significant categories with some subcategories. Categories were refined by adding new subcategories and filling others with more meaningful data. Through theoretical coding, the links between the categories were analysed, and a core process emerged. At this stage, all transcripts were used to fill categories and to analyse links between the categories to describe the variation in the core process. The core process guided the analyses [86, 93]. Thereafter, the researchers went back and forth between the data, focused codes, and the core process to delineate and describe the theoretical concepts and their interrelations. In this way, thin categories were filled, and categories with less significance were omitted. Memos were written all along to keep track of the process.

3.8 ETHICAL CONSIDERATIONS

The Regional Ethical Review Board in Stockholm, Sweden, approved the study (dnr.2011/2011-32; 2011/1198-31/2). The studies were conducted in accordance with the ethical principles in the Declaration of Helsinki [94]. A number of ethical considerations were taken into account when planning for the studies in this thesis. First, the need for informed consent was considered. Managers at the PHCCs received written information and agreed that professionals working at their centres could participate in the study. The primary health care professionals and the participating patients gave their written and informed consent to participate and received information about their right to stop participating whenever they wanted without any need to explain why. Second, the sensitive nature of the situation of participating patients was considered. Patients who receive home health care are dependent on this care, and the questions about their nutritional status could be sensitive, so special care to emphasize the voluntary nature of participation was taken. Third, all participating professionals were given the researchers' contact details in case they had questions or wanted to make comments about the study. Finally, all research material was treated confidentially.

4 MAIN RESULTS

4.1 PROFESSIONALS' BACKGROUND (STUDIES I-IV)

Table 2 shows background data on the professionals included in Studies I to IV. When the perspectives of the professions were analysed together (Study II), no statistically significant baselines differences were found between the professionals in the IG and CG in age, sex, number of years worked in their current profession, or number of years worked with patients who receive basic home care. However, more professionals in the IG than the CG worked solely with home care at baseline and follow up, and more professionals in the CG than the IG had participated in a course about prescribing oral nutritional supplements at baseline (data not shown).

When the perspectives of both professions were analysed separately (Study III), a few statistical differences between baseline and follow-up were found. The DNs in the CG had worked more years with patients receiving home care than had the GPs in the CG (at baseline). More DNs in the IG than in the CG worked solely with home care (at both baseline and at follow up). More DNs in the CG than the IG had 1) participated in a course about prescribing oral nutritional supplements (at baseline) and 2) had received other nutritional education (at follow-up) (data not shown).

Table 2. The background of district nurses and general practitioners in the intervention and control groups.

		Intervention group (n=87) DN48/GP39 Baseline	Control group (n=53) DN36/GP17 Baseline	Difference IG-CG	p-value
Sex, female (%)	DN	97.9	100		1.00 ¹
	GP	56.4	64.7		0.77 ¹
Difference (DN-GP)	p-value	0.000 ¹	0.001 ¹		
Number of years worked in your current profession.					
Median (95 % CI), year	DN	12 (6-14)	12 (3-19)		0.88 ²
	GP	12 (7-15)	8 (6-15)		0.18 ²
Difference (DN-GP)	p-value	0.58 ²	0.36 ²		
How many years have you worked with patients who are receiving basic home health care?					
Median (95 % CI), year	DN	6 (3-10)	8 (5-14)		0.20 ²
	GP	5 (4-7)	4 (2-8)		0.41 ²
Difference (DN-GP)	p-value	0.52 ²	0.02 ²		

¹Chi2/Fisher.

²Two-sample Wilcoxon rank-sum (Mann-Whitney) test, p-value < 0.05 = significant difference between DN and GP.

Abbreviations: DN, district nurse; GP, general practitioner; IG, intervention group; CG, control group

4.2 EVALUATION OF THE CONPRIM® MODEL (STUDY I)

Sixty-seven of the 87 professionals who participated in the intervention evaluated the ConPrim® model's design, pedagogy and adaptation to primary health care circumstances. The majority of the median values for all statements were 4's ("fully agree"). However, the median values for all statements varied between 3 ("mainly agree") and 4. The interquartile range also varied between 3 and 4, except for the practical exercise, for which the interquartile range varied between 2 ("partly agree") and 4. The mean rank for all statements varied between 3.2 and 3.6, except for the statement about the practical exercise, for which the mean rank was 2.9.

The first part of the questionnaire was about the design of the three parts of the ConPrim® model: the web-based program, the practical exercise, and the case seminar. Over 90% found the web-based program user-friendly and the introduction to the web-based program, the program itself, and the case seminar attractive. A total of 86% found the practical exercise attractive.

The second part of the questionnaire was about the pedagogy of the three parts of the ConPrim® model. The results showed that 90% or more of the professionals found that the three parts of the model promoted interactive learning and interprofessional learning and that the case methodology promoted learning.

The third part of the questionnaire was about the model's adaptation to the circumstances of primary health care. An analysis of the responses showed that approximately 90% of the professionals agreed that all three parts of the intervention were relevant to their clinical work, that the intervention was suitable to primary health care, that their competence in the subject area increased, and that they could use what they learned. More than 80% of the professionals agreed that the time spent on the two parts of the web-based program and on the case seminar was acceptable, whereas a slightly lower percentage (68%) found the time spent on the practical exercise acceptable.

4.3 EVALUATION OF THE INTERVENTION (STUDIES II AND III)

Study II evaluated the effectiveness of the intervention from the perspective of all professionals (DNs and GPs together) and examined their responses to each statement on the questionnaire. Study III also evaluated the effectiveness of the intervention, but evaluated DNs and GPs responses separately by the three main topic areas.

4.3.1 Perceived familiarity (area one) and perceived collaboration (area two)

When the perspectives of the professions were analysed together, statistically significant differences were found between the professionals in the IG and CG in responses to a number of the 18 statements (baseline): the professionals in the CG reported greater perceived familiarity (two statements) and greater collaboration (two statements) than the professionals in the IG (baseline) (Study II).

When the professionals' responses at baseline and follow-up in the IG and the CG were compared (intra-group analysis), statistically significant changes were found in the IG in the responses to all 18 statements and in the CG in response to three statements. Statistically significant intervention effects were also found in the responses to all 18 statements (Study II). The ORs varied between 3.2 and 12.0.

When the professions were analysed separately in the IG and CG, DNs in the CG had statistically significantly greater perceived familiarity than GPs in the CG (baseline and follow-up). The DNs in the CG also had greater perceived familiarity and perceived collaboration than DNs in the IG (baseline) (Study III).

Intra-group analysis by profession in the IG showed statistically significant changes among both the DNs and the GPs in the areas of perceived familiarity and perceived collaboration. No such changes were found in the CG. The intervention effects for both DNs and GPs were significant in both areas and were similar for both professions (Study III).

4.3.2 Level of knowledge (area three)

When the level of knowledge of both professions was analysed together, differences were found in the responses of the IG and CG to 1 of 14 statements (baseline); the CG began the study with greater understanding of how common it was for patients in the early palliative phase to have nutritional problems (Study II).

When the professionals' responses at baseline and follow-up in the IG and the CG were compared (intra-group analysis), the IG's responses to 10 of the 14 statements and the CG's response to 1 of the 14 statements had changed significantly. There were statistically significant intervention effects in two of the 14 statements: "It is common for patients in the early palliative phase to have nutritional problems" (OR 2.8; p = 0.001) and "In the late palliative phase of life, energy and nutrient intake is no longer expected to lead to improved nutritional status" (OR 2.5; p = 0.009) (Study II).

In the area of level of knowledge, no significant differences were found in either the IG or CG by profession or between the professions at either baseline or follow-up. Intra-group analysis by profession in the IG showed statistically significant changes in the level of knowledge of the DNs and of the GPs. No such changes were found in the CG (Study III).

The intervention effects were significant for GPs but not for DNs. A statement-level analysis of the area “level of knowledge” showed that GPs’ level of knowledge increased significantly with regard to four statements about nutritional care: “It is common for patients in the early palliative phase to have nutritional problems,” “The MNA should be used to assess nutritional status and risk of undernutrition in all patients who are in the early palliative phase,” “In the late palliative phase of life, energy and nutrient intake is no longer expected to lead to improved nutritional status,” and “In the late palliative phase, fatty and protein-rich foods can cause the patient to feel nauseous.” District nurses’ level of knowledge increased significantly with regard to one statement: “It is common for patients in the early palliative phase to have nutritional problems” (Study III). The total intervention effect did not differ between DNs and GPs in any of the three areas (Study III).

4.4 EXPLORATION OF INTERACTION IN A CASE SEMINAR (STUDY IV)

DNs and GPs negotiate the issue of responsibility for nutritional care for patients cared for at home via an ongoing interprofessional dialogue. The issue of responsibility is raised in a way that invites response or a way that discourages it. If the issue is raised in a way that invites response, then professionals may respond in a way that starts an interprofessional dialogue and leads to interprofessional learning. This interprofessional learning can consist of learning simple facts, gaining an overview by summarizing what has been discussed, having an eye-opening experience, opening up for change in the distribution of responsibility, or finding a solution to a problem. However, if the issue is raised in a way that discourages response, then professionals may respond in a way that blocks interprofessional dialogue. They can do so by derailing or closing ranks. Derailing leads to dropping the issue, whereas closing ranks leads to uniprofessional dialogue. In both cases no interprofessional learning takes place (Fig. 3).

In summary: It is as if the professionals are playing a game of responsibility in which the issue of responsibility is the ball. When DNs and GPs play as a team, it leads to the goal of interprofessional learning. If the ball is tossed in a gentle way, another player can respond by catching the ball, and the DNs and GPs then play as a team and hit the goals jointly (interprofessional learning). However, when the balls are too hard or too many, the game is derailed and the ball rolls off the court or the professionals continue to play, but only with the members of their own profession. No goal can be made (no interprofessional learning).

THEORETICAL MODEL

Negotiating responsibility for nutritional care
for patients with home care

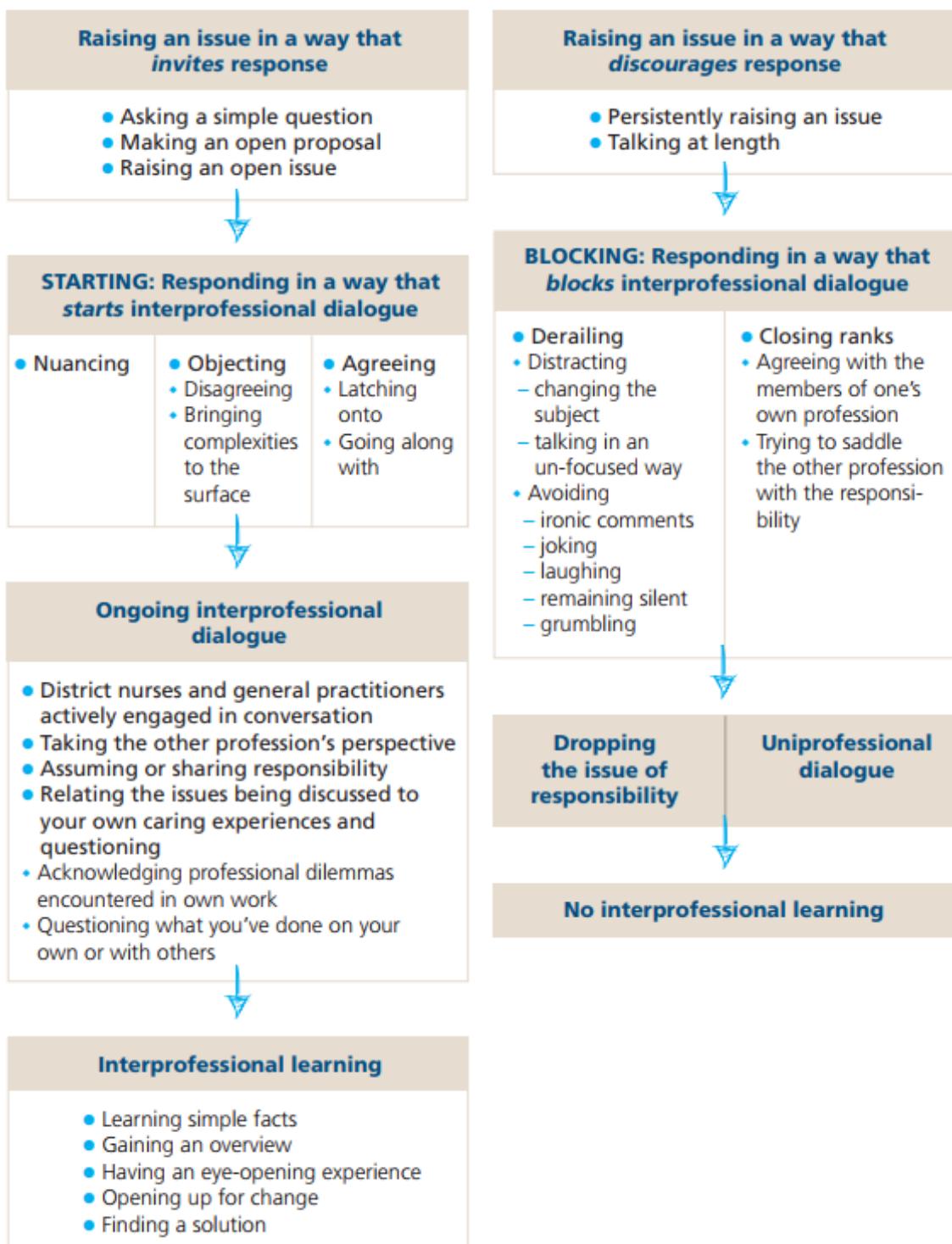


Figure 3. Presents the theoretical model: Negotiating responsibility for nutritional care for patients with home care.

5 DISCUSSION

5.1 MAIN FINDINGS

The studies in this thesis 1) evaluated the ConPrim® model as used in the subject-specific intervention “Nutritional care for patients cared for at home,” 2) evaluated the effectiveness of the intervention (DNs and GPs together; presented by statement), 3) evaluated the effectiveness of the intervention by profession (DNs and GPs separately; presented by topic area), and 4) explored DNs and GPs’ interactions in a case seminar.

The evaluation of the model showed that the professionals thought the contents of all parts were relevant to their clinical practice and that the pedagogy and teaching methods promoted interactive and interprofessional learning. The majority agreed that the model, as applied in the intervention, was suitable to primary health care and increased their subject-specific competence. They also agreed that they could use what they learned in their clinical practice. Although the majority found the design of the three parts of ConPrim® attractive and the time spent on it acceptable, fewer felt this way about the practical exercise.

The evaluation of the effectiveness of the intervention that examined the professions together showed statistically significant improvements in the IG’s responses to all statements in areas one and two (familiarity with information important to nutritional care in a palliative phase and perceived collaboration with other caregivers). In the third area (level of knowledge about important aspects of nutritional care), there were statistically significant improvements in the IG’s responses to all but four statements. In the CG, however, statistically significant changes were only found in a total of four statements. Furthermore, statistically significant intervention effects were found in the IG’s responses to all statements in areas one and two (perceived familiarity and perceived collaboration) and in two of the statements in area three (level of knowledge).

The area-level evaluation, by profession, of the effectiveness of the intervention showed statistically significant improvements in the IG in all three areas but no such improvements in the CG. The intervention effects were significant and similar for both professions in all areas except area three (level of knowledge), where the effects were significant for GPs but not DNs. The total intervention effect did not differ between DNs and GPs in any of the areas.

The exploration of DNs and GPs’ interaction in the case seminar resulted in a theoretical model that describes how DNs and GPs negotiate the issue of responsibility for nutritional care via a uniprofessional dialogue (which does not lead to interprofessional learning) or an ongoing interprofessional dialogue (which under certain circumstances can lead to interprofessional learning).

5.1.1 The practical exercise (Study I)

The professionals were not as fully satisfied with the practical exercise as they were with the other parts of the model as applied in the intervention. The main source of this result was the time spent on the practical exercise. The professionals did not fully agree that the amount of time they spent on the exercise was acceptable. This may be because during the exercise, the DNs were asked to administer not just the MNA, but three extra forms that were not part of the continuing educational intervention. These forms were about the patients' nutritional situations and thus of interest for future research. However, the DNs may have thought that the extra time required to administering these forms made the practical exercise too time consuming. In the future, the intervention will be shorter, as it will only include the MNA. Educators developing other interventions with the ConPrim® model should carefully consider the advantages and disadvantages of using more than one instrument in the practical exercise.

Additionally, some of the professionals did not think that they had participated in the practical exercise, which may have contributed to the lower evaluations of this part of ConPrim®. Because all participating DNs conducted home visits to patients, those who thought they had not taken part were probably GPs. The DNs were to discuss the results of the home visit with GPs, but the extent to which they did so is unclear. It is also possible that some GPs interpreted discussions with DNs as part of everyday work rather than part of the practical exercise. Thus, the instructions should be revised to clarify that the DN and GP should discuss the results of the home visit, including the patient's responses to the MNA, and take any actions necessary. To help ensure that all of the parts of the practical exercise are performed, future interventions could include a form where the DNs and GPs register the completion of all the actions that are part of the exercise.

5.1.2 The area level of knowledge (Studies II and III)

The area level of knowledge improved less than the other two areas. In Study II, there were significant improvements in responses to all statements that assessed perceived familiarity (area one) and perceived collaboration (area two) but only to two of the fourteen statements that assessed level of knowledge. Thus, the intervention was more effective in areas one and two than area three. In Study III, it was found that the results regarding level of knowledge were explained by differences in the level of knowledge achieved by DNs and GPs. Specifically, there were significant improvements in all three areas for GPs, whereas DNs improved significantly in areas one and two but not in area three (level of knowledge).

There are several possible explanations for the relative lack of effectiveness with regard to level of knowledge in Studies II and III. First, professionals might not have adhered fully to every part of the intervention. For instance, some professionals may not have gone through the web-based program carefully, and so did not achieve the desired factual knowledge. Previous studies show that not all learners become involved to the same degree in online learning [95]. Second, it might have been difficult to achieve large improvements in level of knowledge in either professional group in the intervention because both groups started off

with relatively high levels of knowledge. Third, in the model's pedagogical design, each level of knowledge builds on the previous levels, so those who did not fully participate in a certain level may have lacked a foundation upon which to build later. For example, if a professional did not fully participate in the practical exercise (and some reported that they did not), then they might not have entirely achieved the learning objectives of that exercise and may have had difficulty building on this foundation to achieve the learning objectives in the next step (the case seminar).

5.1.3 Deeper level of understanding (Studies I–IV)

A deeper level of understanding facilitates the real-life application of new knowledge in everyday primary health care. To help learners achieve this deeper level of knowledge in interventions developed using ConPrim®, the principles of constructive alignment were used to build the model. Thus, in the intervention "Nutritional care for patients cared for at home," professionals had the opportunity to deepen their understanding of the subject, including caring concepts incorporated in the intervention.

The results of Studies I, II, and III do not clarify whether professionals actually achieved a level of understanding deep enough to use their knowledge in everyday practice. However, in Study I, the majority of professionals agreed that their competence in the subject increased and that they would be able to use what they had learned in their clinical work. Studies II and III showed that the professionals' knowledge increased [68, 83].

Indications of a deeper level of knowledge can be found in Study IV. Interprofessional learning occurred in the case seminar discussions when an issue was raised in an inviting way that started an ongoing interprofessional dialog. This result suggests that under such circumstances, professionals reflected and combined new knowledge with their own experiences to solve the case collaboratively, actions in keeping with part three in ConPrim® and with SOLO taxonomy levels 4 and 5 [73, 96]. Specifically, actions identified in the ongoing interprofessional dialogue can be categorized as belonging to higher levels of the SOLO taxonomy. Examples include "finding a solution" and "opening up for change." The ongoing interprofessional dialogue may thus have given DNs and GPs a deeper level of understanding of the nutritional problems and needs of patients cared for at home.

5.1.4 The quality of the ConPrim® model used in the intervention (Studies I–IV)

In 2011, the multiprofessional group designed ConPrim® because the search for continuing educational models to fulfill the special needs of primary health care did not identify any suitable model or intervention. In 2014, a Canadian group conducted a similar search for models that could be used to develop a continuing interprofessional educational intervention suited to the special needs of tertiary care [97]. They found five models, which they reviewed in light of seven criteria described by Scott Reeves in an article on trends in the development of interprofessional education: conceptual clarity, quality, safety, technology, assessment of learning, faculty development, and theory [71]. Only one model met all seven criteria

necessary for quality in continuing interprofessional education, although it had some weaknesses. The Canadian team concluded that the criteria were helpful in selecting a model for continuing interprofessional education in a tertiary setting.

A reflection on whether or not ConPrim® meets these criteria shows that although the model has some weaknesses, it also meets each criteria to some extent. This suggests that the model is potentially useful for educators wishing to develop continuing interprofessional educational interventions for primary health care professionals. With regard to the first criteria, ConPrim® defines the key concepts of IPE and CIPE and makes it clear that the intervention is education-based. It states the setting in which the intervention is to be delivered (primary health care), how it is to be delivered, and learning methods to be used. ConPrim® thus meets the basic criteria for conceptual clarity. With regard to the second criteria, the model is designed to promote everyday teamwork via education at the participants' own workplace. It incorporates team-based learning activities, is based on authentic cases encountered in everyday work, and builds on professionals' existing experience (is experience-based in design). These are all indications that ConPrim® meets the criteria for quality described by Reeves.

With regard to the third criteria, all parts of ConPrim® build on each other to help learners achieve subject-specific knowledge, collaboration, and the deeper level of understanding needed to apply what they learned in practice. These characteristics are those that Reeves indicates have the potential to improve team communication and thereby help health care professionals achieve safer care for patients. With regard to the fourth criteria, the model is designed to increase professionals' ability to take part in CIPE by providing at-the-workplace education and using technology; for example, in the form of a web-based program that professionals can complete at a time of their choice. Thus, it meets the criteria of incorporating technology to help busy professionals participate in IPE.

With regard to the fifth criteria, participants' learning as a result of the ConPrim® model as applied in the subject-specific intervention was measured with questionnaires. ConPrim® thus partly met the criteria of rigorous assessment of interprofessional learning, but use of validated instruments could have increased the rigour of the measurements. With regard to the sixth criteria, in the intervention developed using the ConPrim® model, facilitators were specially prepared to lead interprofessional case-seminar discussions via pedagogical coursework. Moreover, an important task of the APC, where the facilitators are employed, is to enhance interprofessional collaboration and provide CIPE that promotes such collaboration. Thus, the ConPrim® model met the criteria of preparing educators to facilitate interprofessional learning.

With regard to the seventh criteria, ConPrim® was developed using the principles of constructive alignment and the SOLO taxonomy, so the model also fulfils the criteria of being clearly based on theory. The subject-specific intervention developed using the model used concepts and theories that were grounded in research so that learners could better construct knowledge through their interactions and activities. However, use of such concepts and

theories was not clearly specified as part of the ConPrim® model itself. Future guides to ConPrim® could add this explicit instruction and thereby potentially improve the model.

5.2 METHODOLOGICAL CONSIDERATIONS

The professionals at the ten PHCCs included in the study were not chosen at random; this was a limitation of the thesis. At first, randomization of each individual into either an IG or a CG was considered. When this proved unfeasible, all professionals at the participating PHCCs were placed in the IG, and the professionals in the CG were recruited separately. Nevertheless, the IG and CG were largely comparable at baseline (Studies II and III). In Study II, it was found that more professionals in the IG worked solely with home care but that fewer had taken part in a course about prescribing oral nutritional supplements.

Furthermore, the professionals in the IG scored lower than those in the CG with regard to five of the 22 statements about perceived familiarity, perceived cooperation, and level of knowledge. The DNs in the IG scored lower than DNs in the CG in the areas of perceived familiarity and perceived cooperation. There are several possible explanations for these differences. Interest in and knowledge about nutritional care might not have been the same in the IG and the CG. The professionals in the IG were encouraged but not required by their manager to participate, whereas the CG consisted entirely of volunteers who were thus probably more interested in the subject. Furthermore, since the professionals in the CG responded to the first questionnaire at a later point in time than those in the IG, they had more time to learn about nutritional care on their own or via the Stockholm County course about oral nutritional supplements, which includes information about nutritional care.

These baseline differences between the IG and CG would have caused the intervention's effectiveness to appear lower, rather than higher, than it actually was. Although the professionals in the IG had lower baseline scores than the professionals in the CG, the IG's scores in all three areas had changed more at follow-up (Studies II and III).

One strength was that the intervention and the questionnaires used in Studies I through III were developed and pilot tested by a multi-professional research team with expertise in nutritional and palliative care and the organization of primary health care in Sweden.

Pedagogical experts were consulted in the development of the intervention. Both questionnaires were developed for the studies in this thesis; i.e., they were study-specific. This is in keeping with Thistlethwaite et al.'s call for researchers to more carefully consider which questions to ask in order to ensure that evaluations illuminate the outcome the researchers want to assess [98]. Because they were specifically developed for the studies, the questionnaires were not fully validated, but on the other hand, they were carefully pilot-tested and developed to answer the specific questions that corresponded to the aims of the study. A possible strength of the questionnaire developed for Study I was the relatively small number of statements, which made the questionnaire quick and easy to answer. However, this brevity might also have meant it did not cover all topics the professionals considered relevant. To balance this potential weakness, the professionals were given the option to provide comments at the end of the questionnaire.

Another strength was that Cronbach's alpha, which should be > 0.70 , was 0.80-0.95, which shows that all three areas of the questionnaire were internally consistent. Measures were also taken to avoid problems with mass significance (type I errors) in Studies II and III. In Study II, we set the level of significance at $p \leq 0.01$. In Study III, the FDR was calculated, and based on the result, set the level of significance at $p \leq 0.025$ [91].

Both the IG and CG completed the follow-up questionnaire one month after the baseline questionnaire, so the follow-up time was the same for both groups. All professionals had to respond to all questions to continue the questionnaire, and there was no "don't know" response alternative. This meant that there was no internal dropout for any question, which is strength. On the other hand, one cannot know if there were any questions that the professionals would have skipped if possible, which is a limitation. However, the questionnaires were both pilot tested. Additionally, a think-aloud test was used to ensure the readability and clarity of the questionnaire that evaluated the intervention.

Only professionals who answered the questionnaire at both baseline and follow-up (76%) were included in Studies II and III. The power calculation undertaken prior to Study II showed that the number of participants was sufficient to achieve 80% power ($\alpha = 0.05$). However, in the CG in Study III, only 17 GPs completed the questionnaire at follow-up, and there is no information on why. It is possible that they lacked subject-area knowledge but had no opportunity to skip individual statements, which might have made it too difficult to respond to the questionnaire.

The control group received no specific intervention. An alternative choice would have been to compare use of the entire intervention (IG) with 1) no specific intervention (CG1) and 2) use of only the web-based program (CG2). This would have given more information on the effectiveness of the model as a whole as compared to just the web-based program. However, the model was carefully designed to work as a whole in keeping with the SOLO taxonomy, in which each step in learning builds on the previous step [73].

Furthermore, time and financial limitations meant that we did not have the opportunity to conduct long-term follow-up of level of knowledge or to measure whether the intervention led to changes in clinical practice. Thus, a follow-up study is thus needed.

Because the professionals came from ten health care centres located in different geographic areas and their patients represented a variety of socioeconomic groups, the results may be applicable to the other 185 centres under contract to the Stockholm County Council. The results might also be applicable to other primary care organizations where conditions are similar.

In Study IV, GTM was used in accordance with the constructivist views of Charmaz [86]. The theoretical model that resulted from the study is considered one of many possible constructions that make a specific set of data more comprehensible. The researcher is not an

objective observer but a constructor with values and preconceptions that need to be considered and examined [87].

According to Charmaz, grounded theory studies should include a consideration of the criteria of credibility, originality, resonance, and usefulness. Charmaz found that these guiding criteria could add stringency to grounded theory studies. Credibility means that there is a strong link between conceptual categories and empirical data, that the research achieved familiarity with the setting and topic, and that scrutinized methodological procedures were used in data collection and analysis [86]. Originality is about the development of new knowledge and about insight into the phenomena in the study. Resonance is about the fullness of participants' experiences and whether findings reflect these experiences. Usefulness concerns the contribution of knowledge, the usability and relevance of the results for those in the field being studied, and whether or not the results spark new research in the studied area.

The theory presented in Study IV is well grounded in the DNs and GPs' discussions as they attempted to solve an authentic case together. The results resonate with the workplace actions of both DNs and GPs. The analysis led to new knowledge and the construction of a theoretical model that gives meaning to categories and distinguishes categories from each other. The result may inspire others to use the theoretical model in contexts similar to the current context.

The stepwise analytical procedure outlined in the methods section was followed. Strict traditional theoretical sampling was not carried out, but in the stepwise analysis, new questions led to analyses of new seminars and to reanalysis of previously analysed seminars. The originality of the study is found in the illustration of how interprofessional learning depends on the way the dialogue develops in interprofessional interventions.

6 IMPLICATIONS FOR HEALTH CARE

This thesis found that the intervention “Nutritional care for patients cared for at home,” developed using the ConPrim® model, may help provide a better foundation for good nutritional care for patients in a palliative phase cared for at home. It could therefore be advantageous to continue to offer the intervention after it is adjusted in accordance with the results of this thesis. The ConPrim® model might also be useful in developing continuing interprofessional interventions in other subjects where gaps exist between research results and clinical practice in primary health care.

This thesis also showed that to achieve interprofessional learning, case seminar facilitators should pay particular attention to the nature of the dialogue health care professionals engage in while solving a case. That is, to achieve interprofessional learning, the facilitators should encourage ongoing interprofessional rather than uniprofessional dialogue. Finally, the model can be used as a tool in the education of teachers to help them better understand the interprofessional learning process in case seminar discussions.

7 CONCLUSIONS

“Nutritional care for patients cared for at home,” developed using the ConPrim® model, is a promising continuing interprofessional educational intervention. It may create the prerequisites for DNs and GPs to work in teams and to achieve a deeper level of understanding of patients’ needs for nutritional care.

Study I, which evaluated the professionals’ perceptions of ConPrim® as used in the intervention, showed that the professionals were highly positive about the model, including design, pedagogy and interprofessional learning, adaptation to primary care, increased competence, and ability to use what they had learned. They were less fully satisfied with the time spent on the practical exercise. The instructions for exercise should thus be revised to increase clarity.

Overall, Studies II and III, which evaluated the effectiveness of the intervention, showed that it was successful in areas one and two: increasing professionals’ perceived collaboration with other caregivers and perceived familiarity with information important to nutritional care for patients in a palliative phase. In the third area, level of knowledge, in which both professions had a relatively high level of knowledge at baseline, the intervention did not increase DNs’ knowledge as much as GPs’. There is therefore a need to adjust some of the factual content of the web-based program and to clarify the instructions to help ensure that the professionals complete the program in a thorough manner. The results of Study III underscore the importance of evaluating the effectiveness of IPE interventions by profession to help ensure that they are suitable for all professions.

Study IV, which explored DNs and GPs’ interactions in case seminar discussions, shed light on the difference between uniprofessional and interprofessional dialogue and the importance of ongoing interprofessional dialogue for interprofessional learning. The actions identified in the ongoing interprofessional dialogue may have given DNs and GPs a deeper level of understanding of the nutritional problems and needs of patients cared for at home.

8 FUTURE PERSPECTIVE

Although the intervention is promising, additional work is needed to examine the clinical practice outcomes of interventions developed using the ConPrim® model. Such outcomes could include measures of teamwork and patients' experiences of health and well-being. A next step in evaluating ConPrim®-based interventions could be to compare knowledge gains and clinical practice outcomes after the whole intervention (all three parts) with gains and outcomes after only one or two parts of the intervention (e.g., only the web-based program).

The grounded theory model, “Negotiating responsibility for nutritional care for patients with home care,” also opens the door to interesting future research projects. For instance, it could be used to create a tool for providing feedback to case-seminar facilitators. The tool could also be used in an observational study that compares dialogue/interprofessional learning after sharing vs. after not sharing the model with participants prior to case seminar discussions.

9 SAMMANFATTNING PÅ SVENSKA

BAKGRUND

Den allt åldrande befolkningen är en stor utmaning för hela samhällssystemet världen över och WHO betonar att primärvården är viktigare än någonsin. Även om åldrandet innebär många positiva möjligheter för den äldre personen, deras familjer och för samhället ökar andelen äldre personer med kroniska sjukdomar och komplexa vårdbehov. Likaså behov av vård i hemmet med stöd för att upprätthålla ett aktivt liv och för att personer ska uppleva hälsa och välbefinnande trots sjukdom. Primärvården är ofta människors första vårdkontakt och tillsammans med personalens besök i hemmet utgör denna vårdform ungefär hälften av alla patientbesök i hälso- och sjukvårdssystemet. I Sverige är det också i primärvården alternativt kommunen som personer i tidigt palliativt skede vårdas (basal hemsjukvård) medan de i sent skede ofta får specialiserad sjukhusansluten hemsjukvård. Personer i tidigt palliativt skede har kroniska obotliga sjukdomar och kan befina sig i detta skede under lång tid, ibland flera år. Då vårdbehov och behandling skiljer sig åt mellan de olika skedena behöver vårdpersonal en god kompetens inom många olika ämnesområden som inom nutritionsvård för att tillgodose personens aktuella behov.

Primärvårdens personal som distriktsköterskor och distriktsläkare ska kunna erbjuda den äldre personen god hälso- och sjukvård, att arbeta i team och ha adekvat uppdaterad kunskap, vilket ibland brister. Idag är kunskapsutvecklingen mycket stor och det är viktigt att det finns adekvata fortbildningssystem som är uppdaterade och genomsyrar hela organisationer. WHO menar att en av de viktigaste utmaningarna inom den öppna hälso- och sjukvårdsorganisationen är gapet mellan vad forskningsresultat visar och vad som faktiskt görs i praktiken för att tillgodose patientens vårdbehov. Ett område där det finns ett sådant tydligt gap är vård av äldre patienter med nutritionsproblem. Detta medför onödigt lidande för både patienter och närliggande till exempel då patienter med nutritionsproblem inte identifieras och bedöms enligt tillgängliga och framtagna metoder och inte får den nutritionsvård de behöver. Anledningarna är många men inkluderar bristfällig kompetens bland hälso- och sjukvårdspersonalen och brister när det gäller teamarbete.

För att forskningsresultat skall komma patienter tillgodo och patienters vårdbehov tillgodoses är det angeläget med fortbildning som är anpassad efter primärvårdens förhållanden och behov. Fortbildning behöver designas så den underlättar personalens deltagande, vara anpassad innehållsmässigt för att personalen skall uppleva praktisk nytta samt vara interprofessionell för att underlätta teamarbete. Fortbildning behöver även baseras på vårdande begrepp för att ge nyanser och förtydliga innehörder samt på pedagogiska teorier. Detta för att åstadkomma fördjupat lärande och förändrat arbetssätt i praktiken.

Då akademiskt primärvårdscentrum (APC) fick uppdraget att utbilda primärvårdens personal (distriktsköterskor och distriktsläkare) inom ämnesområdet nutritionsvård gjordes en litteratursökning över fortbildningsmodeller. Ingen lämplig effektiv fortbildningsmodell som uppfyllde primärvårdens behov påträffades och det blev därmed angeläget att utveckla.

MÅLSÄTTNING

Den övergripande målsättningen med denna avhandling var att utvärdera en intervention om nutritionsvård till patienter med vård i hemmet där en interprofessionell fortbildningsmodell anpassad till primärvården användes, ConPrim® Continuing education in Primary health care.

MATERIAL OCH METOD

Avhandlingen inkluderar fyra studier om en ämnesspecifik intervention ”Nutritionsvård till patienter med vård i hemmet” som designats med hjälp av en modell (ConPrim®) för fortbildning till personal som arbetar i primärvården. ConPrim® består av tre delar: ett webbaserat program, en praktisk övning och ett case-seminarium. Varje del är anpassad till personalens möjlighet att delta och till primärvårdspersonalens kunskapsbehov inom nutritionsvård. Därtill omfattar varje del interprofessionellt lärande för att underlätta teamarbete i praktiken. Interventionen tar stöd av ett vårdande perspektiv för ett fördjupat lärande och ökad medvetenhet för god nutritionsvård till patienter med vård i hemmet. Varje del är också uppbyggd efter den pedagogiska teorin ”Constructive alignment” (konstruktiv länkning) för att åstadkomma ett fördjupat lärande och förutsättningar för förändrat arbetssätt i praktiken.

Deltagare var distriktsköterskor (DSK) och distriktsläkare (DL) indelade i interventionsgrupp (IG) och kontrollgrupp (KG). I studie I och IV användes enbart data från interventionsgruppen men i studie II och III användes data från både interventionsgruppen och kontrollgruppen. Tre av studierna är kvantitativa (I-III) och en är kvalitativ (IV). Studie I utvärderade interventionsgruppens upplevelse ($n=67$) av ConPrim®-modellen genom ett webb-baserat frågeformulär. Studie II och III utvärderade effektiviteten av interventionen ”Nutritionsvård till patienter med vård i hemmet”. Dessa två studier (II och III) analyserade resultatet av ett studiespecifikt frågeformulär som omfattade 32 påståenden inom tre huvudområden: 1. Förtrogenhet med kunskap viktig för nutritionsvård i ett palliativt skede. 2. Samarbete med andra vårdgivare med inriktning på patienters nutritionsproblem och behov. 3. Kunskapsnivå om viktiga aspekter av nutritionsvård. Studie II utvärderade effektiviteten av interventionen för både distriktsköterskorna och distriktsläkarna gemensamt (IG=87, KG=53) och resultatet presenteras per påstående inom varje huvudområde. Studie III utvärderade effektiviteten per profession (IG: DSK $n=48$, DL $n=39$; KG: DSK $n=36$, DL $n=17$), dvs. för distriktsköterskor och distriktsläkare separat och resultatet presenteras per huvudområde. I Studie IV användes grundad teori som metod för att analysera interaktionen mellan distriktsköterskor och distriktsläkare under diskussionerna i åtta case-seminarier med totalt 87 deltagare (46 DSK och 41 DL).

RESULTAT

Distriktsköterskor och distriktsläkare ansåg att ConPrim® modellen applicerad i interventionen var lämplig, att designen av webprogrammet och case-seminariet var attraktivt, och att de kunde använda vad de hade lärt sig om nutritionsvård i den kliniska vardagen (studie I). Med undantag av den praktiska övningen så fann personalen tiden som de lagt ned på utbildningen acceptabel. Studie II, visade statistiskt signifikanta effekter i totalt 20 av de 32 påståendena (intergruppanalyserna) dvs. i samtliga påståenden om förtrogenhet med viktiga begrepp och samtliga påståenden om samarbete med andra vårdgivare och i två av påståendena som gällde faktakunskap (2 av 14 påståenden). Studie III, visade statistiskt signifikanta förbättringar för både distriktsköterskor och distriktsläkare i huvudområdena 1 och 2, och för distriktsläkare i huvudområde 3. Den totala interventionseffekten var signifikant i samtliga tre huvudområden ($p = 0.000 - p = 0.004$). I studie IV konstruerades en teoretisk modell som beskriver hur distriktsköterskor och distriktsläkare förhandlar frågan om ansvar för nutritionsvård genom en uniprofessionell dialog (vilken inte leder till interprofessionellt lärande) eller en pågående interprofessionell dialog (vilken under vissa förhållanden kan leda till interprofessionellt lärande).

SLUTSATSER

Fortbildningsintervention ”Nutritionsvård till patienter med vård i hemmet” som utvecklades med hjälp av ConPrim®-modellen är en lovande intervention för primärvården. Den kan skapa förutsättningar för att distriktsköterskor och distriktsläkare kan nå fördjupad förståelse för patienters behov av nutritionsvård, för samarbete och för god nutritionsvård i praktiken.

Den grundade teoretiska modellen belyser vikten av distinktionen mellan uniprofessionell och interprofessionell dialog då enbart den sistnämnda kan leda till ett interprofessionellt lärande. Lärare eller vårdutvecklingsledare som använder sig av case-metoden (case-seminarie) behöver därmed vara särskilt uppmärksamma på vilket sätt dialogen sker och försöka uppmuntra interprofessionell dialog för att åstadkomma interprofessionellt lärande. Modellen kan även utvecklas till ett verktyg i utbildningar av lärare i case-metodik för att skapa förståelse för den interprofessionella lärandeprocessen i diskussionerna i case-seminarier. Utifrån resultaten i denna avhandling behöver instruktionerna för den praktiska övningen och innehållet i det webbaserade programmet förtydligas. Med hänsyn till de goda resultaten vad gäller fortbildningsinterventionen kan den efter tänkta justeringar fortsätta att användas som utbildning för primärvårdspersonal. Fortsatt forskning behövs när det gäller interventionens resultat i den kliniska praktiken vad gäller teamarbete och patientens upplevelse av nutritionsvård. ConPrim®-baserade interventioner behöver också prövas inom andra ämnesområden som inom symptomområdet smärta. Vidare är det angeläget att undersöka effekten av enbart till exempel det webbaserade programmet och resultatet av hela ConPrim® med samtliga tre delar.

10 ACKNOWLEDGEMENTS

First, I want to take the opportunity to thank all of you who have contributed to my thesis.

A special thanks to all participants in this study: without your involvement, it would not have been possible to carry out this project. In particular, thanks to every patient who participated in their home and to district nurses/registered nurses and general practitioners/physicians who were involved via their own home health care work.

Thanks also to all my wonderful colleagues at the Academic Primary Health Care Centre (APC), the Palliative Knowledge Centre (PKC), the Stockholm Sjukhems Foundation FoUU (R&D), and to patients and their families at my workplace Advanced Home Health Care (ASIH) Stockholm North and to my new and old colleagues there.

I likewise want to express my gratitude to my research colleagues for interesting discussions, for your generous support, and for sharing your experiences, all of which have helped me move ahead in this exciting project.

Special thanks go to my supervisor:

Lena Törnkvist, associate professor, for always showing faith in me and this project. Professionally, you have guided me through this academic process with your confident hand and natural courage. I am also grateful for our friendship that has evolved during this fantastic time.

I would also like to warmly thank my co-supervisors:

Peter Strang, professor in palliative medicine, for your interest in and concern for my growth during my doctoral education and for generously sharing your rich wisdom.

Ylva Orrevall, PhD, for superb support in this field, your constructive criticism, for challenging me, and for inspiring me to do this work.

Ann Ödlund Olin, PhD, for supporting me, for encouraging me by sharing your experiences, for your specialist knowledge in the subject, and for backing me up regarding nursing skills.

Ingrid Hylander, associate professor, for your excellent support in grounded theory methodology and for providing educational analytic guidance.

Deep gratitude also goes to:

Barbro Mendel, PhD and mentor, for your attention and commitment to my concerns. You offer me quick and generous support and always encourage me to move forward in my journey.

Hanna Sandelowsky, GP and PhD student, for being my companion and facilitator in all the case seminars, co-author of Study 1, and a highly valuable colleague who supported me through the continuing interprofessional educational intervention.

Kim Kane, scientific editor, for your humble and capable supervision in scientific writing and in proper English. Your comments make an important difference.

Robert Szulkin, PhD, for guiding me in statistical skills and for your belief of my ability.

Sven-Erik Johansson, professor, for interesting discussions and excellent guidance in statistics.

George Holm, IT coordinator, for always giving me a professional hand with the considerable Internet material needed in this project.

Daphne Macris, communications officer, for thorough support in the verbal and written presentation of research.

Margaretha Forsberg-Larm, lecturer, for introducing me early to the importance of pedagogy.

Päivi Kaila, senior lecturer, for valuable discussions on health care and perspectives as well as pedagogics.

Teresa Sörö, project manager and Linda Johansson, project manager, for teaching and supervising me in case methodology.

Maria Arman, senior lecturer, for sharing your deep wisdom about the meaning of caring and caring sciences.

The ALF medicine foundation for financial support for my research; the Swedish District Nurse Foundation for showing interest in my research and providing funding that enabled me to attend an international congress in South Korea; and the Swedish Society for Clinical Nutrition and Metabolism (SWESPEN) for funding that made it possible for me to take part in the international ESPEN congress in Denmark in 2016.

And finally, I want to express my joy and gratitude to you, my encouraging friends and family: you really make me rich.

11 REFERENCES

1. World Health Organization WHO: Bridging the “know – do” gap. Edited by (KMS) KMaS, Organization RPaCRWH. Geneva: Printed by the WHO Document Production Services, Geneva, Switzerland; 2006.
2. Nilsson Kajermo K, Alinaghizadeh H, Falk U, Wändell P, Törnkvist L: Psychometric evaluation of a questionnaire and primary healthcare nurses' attitudes towards research and use of research findings. *Scand J Caring Sci* 2014, 28(1):173-185.
3. National Board of Health and Welfare SS: Care for the most ill elderly [Sweden]. Vård och omsorg för de mest sjuka äldre. 2015.
4. World Health Organization WHO: The Contribution of Health Professions to Primary Health Care and the Global Health Agenda. Now more than ever. 2008.
5. World Health Organization WHO: Declaration of Alma-Ata International Conference on Primary Health Care,. Alma-Ata; 1978.
6. World Health Organisation WHO: Framework for Action on Interprofessional Education & Collaborative Practice. Geneva, Switzerland; 2010:2-62.
7. Min. of Health & Social Affairs: Health and Medical Services Act, [Sweden] Hälso- och sjukvårdslagen HSL 2017:30. Edited by 2017:30 Sf. Stockholm: Socialdepartementet; 2017.
8. National Board of Health and Welfare S: Coherent care for the most ill elderly. [Sweden] Sammanhållen vård och omsorg för de mest sjuka äldre. Primärvårdens och äldreomsorgens uppdrag och insatser. . 2011.
9. World Health Organization WHO: Ageing and Health. Edited by centre M: WHO Fact sheets; 2015.
10. Statistics Sweden [Statistiska centralbyrån]: Population projections [Sweden] Befolkningsprognosser.
11. National Board of Health and Welfare S: National support and guidelines in palliative care Nationella Kunskapsstöd och riktlinjer för palliativ vård, [Sweden]. 2013.
12. Home health care of change. [Sweden] Hemsjukvård i förändring. En kartläggning av hemsjukvården i Sverige och förslag till indikatorer [http://www.socialstyrelsen.se/Lists/Artikelkatalog/Attachments/8800/2008-126-59_200812659.pdf]
13. World Health Organization WHO: Definition of Palliative Care. In *policies and managerial guidelines*. Geneve; 2002.
14. Gómez-Batiste X, Martínez-Muñoz M, Blay C, Amblàs J, Vila L, Costa X, Espauella J, Espinosa J, Constante C, Mitchell GK: Prevalence and characteristics of patients with advanced chronic conditions in need of palliative care in the general population: A cross-sectional study. *Palliat Med* 2014, 28(4):302-311.
15. Osborn R, Moulds D, Schneider EC, Doty MM, Squires D, Sarnak DO: Primary Care Physicians In Ten Countries Report Challenges Caring For Patients With Complex Health Needs. *Health Aff (Millwood)* 2015, 34(12):2104-2112.

16. Thoonsen B, Engels Y, van Rijswijk E, Verhagen S, van Weel C, Groot M, Vissers K: Early identification of palliative care patients in general practice: development of RADboud indicators for PAlliative Care Needs (RADPAC). *Br J Gen Pract* 2012, 62(602):e625-631.
17. Arvanitakis M, Coppens P, Doughan L, Van Gossom A: Nutrition in care homes and home care: recommendations - a summary based on the report approved by the Council of Europe. *Clin Nutr* 2009, 28(5):492-496.
18. National Board of Health and Welfare S: Nutrition for good health and social care: guidelines to prevent and treat undernutrition,[Sweden] Stockholm: Socialstyrelsen [Electronic resource] 2011:179 s.
19. Competense description district nurse, [Sweden] Kompetensbeskrivning legitimerad sjuksköterska med specialistsjuksköterskeexamen distriktskötterska
20. The National Board of Health and Welfare: Regulation for medical prescriptions (SOSFS 2001:16) [Sweden] Socialstyrelsens föreskrifter (SOSFS 2001:16) om kompetenskrav för sjukskötterskor vid förskrivning av läkemedel 2001.
21. Over general medicin [Sweden] Om allmänmedicin [<http://www.sfam.se/foreningen/s/om-allmanmedicin>]
22. The Swedish association for general practitioners [Sweden] Svenska Distriktsläkarföreningen [<https://www.slf.se/svdlf>]
23. Greenhalgh T: *Primary Health Care*. Chichester, : John Wiley & Sons, Incorporated; 2008.
24. National Board of Health and Welfare [Sweden] Socialstyrelsen: Healt and social care for the elderly [Sweden] Vård och omsorg om äldre. 2016.
25. Soini H, Routasalo P, Lagstrom H: Nutritional status in cognitively intact older people receiving home care services--a pilot study. *J Nutr Health Aging* 2005, 9(4):249-253.
26. Edfors E, Westergren A: Home-Living Elderly People's Views on Food and Meals. *J Aging Res* 2012, 2012:761291.
27. Griffiths J, Ewing G, Rogers M: "Moving swiftly on." Psychological support provided by district nurses to patients with palliative care needs. *Cancer Nurs* 2010, 33(5):390-397.
28. Chapman IM: Weight Loss in Older Persons. *Med Clin North Am* 2011, 95(3):579-593.
29. Meijers J, Halfens RJG, Neyens JCL, Luiking YC, Verlaan G, Schols JMGA: Predicting falls in elderly receiving home care: The role of malnutrition and impaired mobility. *The journal of nutrition, health & aging* 2012, 16(7):654-658.
30. Edmonds J: Nutrition and wound healing: putting theory into practice. *Br J Community Nurs* 2007, 12(12):S31-34.
31. Arvanitakis M, Beck A, Coppens P, De Man F, Elia M, Hebuterne X, Henry S, Kohl O, Lesourd B, Lochs H *et al*: Nutrition in care homes and home care: how to implement adequate strategies (report of the Brussels Forum (22-23 November 2007)). *Clin Nutr* 2008, 27(4):481-488.

32. Johansson Y, Bachrach-Lindstrom M, Carstensen J, Ek AC: Malnutrition in a home-living older population: prevalence, incidence and risk factors. A prospective study. *J Clin Nurs* 2009, 18(9):1354-1364.
33. Payne C, Wiffen PJ, Martin S: Interventions for fatigue and weight loss in adults with advanced progressive illness. *Cochrane Database Syst Rev* 2012, 1:CD008427.
34. Bergdahl E, Benzein E, Ternestedt B-M, Elmberger E, Andershed B: Co-creating possibilities for patients in palliative care to reach vital goals – a multiple case study of home-care nursing encounters. *Nurs Inq* 2013, 20(4):341-351.
35. Sand L, Strang P: Existential loneliness in a palliative home care setting. *J Palliat Med* 2006, 9(6):1376-1387.
36. Reid J, McKenna H, Fitzsimons D, McCance T: Fighting over food: patient and family understanding of cancer cachexia. *Oncol Nurs Forum* 2009, 36(4):439-445.
37. Sorbye LW, Schroll M, Finne Soveri H, Jonsson PV, Topinkova E, Ljunggren G, Bernabei R: Unintended weight loss in the elderly living at home: the aged in Home Care Project (AdHOC). *J Nutr Health Aging* 2008, 12(1):10-16.
38. Odencrants S, Theander K: Assessment of nutritional status and meal-related situations among patients with chronic obstructive pulmonary disease in Primary health care – obese patients; a challenge for the future. *J Clin Nurs* 2013, 22(7-8):977-985.
39. Jackson VA, Jacobsen J, Greer JA, Pirl WF, Temel JS, Back AL: The cultivation of prognostic awareness through the provision of early palliative care in the ambulatory setting: a communication guide. *J Palliat Med* 2013, 16(8):894-900.
40. Stratton RJ, Elia M: Encouraging appropriate, evidence-based use of oral nutritional supplements. *Proc Nutr Soc* 2010, 69(4):477-487.
41. Holmdahl S, Sävenstedt S, Imoni R: Parenteral nutrition in home-based palliative care: Swedish district nurses experiences. *Scand J Caring Sci* 2014, 28(1):89-96.
42. Suominen MH, Kivistö SM, Pitkala KH: The effects of nutrition education on professionals' practice and on the nutrition of aged residents in dementia wards. *Eur J Clin Nutr* 2007, 61(10):1226-1232.
43. Westergren A: Action-oriented study circles facilitate efforts in nursing homes to "go from feeding to serving": conceptual perspectives on knowledge translation and workplace learning. *J Aging Res* 2012, 2012:627371.
44. Meijers JM, Halfens RJ, van Bokhorst-de van der Schueren MA, Dassen T, Schols JM: Malnutrition in Dutch health care: prevalence, prevention, treatment, and quality indicators. *Nutrition* 2009, 25(5):512-519.
45. Gonzalez-Torrente S, Pericas-Beltran J, Bennasar-Veny M, Adrover-Barcelo R, Morales-Asencio JM, De Pedro-Gomez J: Perception of evidence-based practice and the professional environment of Primary Health Care nurses in the Spanish context: a cross-sectional study. *BMC Health Serv Res* 2012, 12(1):227.
46. Modin S: The medical treament of patients with home care by district nurses from the family physician's perspective. Karolinska Institutet Institutionen för neurobiologi, vårdvetenskap och samhälle; 2010.

47. Baxter P, DiCenso A, Donald F, Martin-Misener R, Opsteen J, Chambers T: Continuing education for primary health care nurse practitioners in Ontario, Canada. *Nurse Educ Today* 2013, 33(4):353-357.
48. Phillips JL, Piza M, Ingham J: Continuing professional development programmes for rural nurses involved in palliative care delivery: An integrative review. *Nurse Educ Today* 2012, 32(4):385-392.
49. Swedish Association of Local Authorities and Regions: Improving life for ill elderly. A qualitative follow-up. *Bättre liv för sjuka äldre. En kvalitativ uppföljning (SWE)* Stockholm; 2012.
50. Santric Milicevic MM, Bjegovic-Mikanovic VM, Terzic-Supic ZJ, Vasic V: Competencies gap of management teams in primary health care. *Eur J Public Health* 2011, 21(2):247-253.
51. Kennelly S, Kennedy NP, Rughoobur GF, Slattery CG, Sugrue S: An evaluation of a community dietetics intervention on the management of malnutrition for healthcare professionals. *Journal of human nutrition and dietetics : the official journal of the British Dietetic Association* 2010, 23(6):567-574.
52. O'Brien MA, Rogers S, Jamtvedt G, Oxman AD, Odgaard-Jensen J, Kristoffersen DT, Forsetlund L, Bainbridge D, Freemantle N, Davis DA *et al*: Educational outreach visits: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev* 2007(4):CD000409.
53. Steinert Y: Learning together to teach together: interprofessional education and faculty development. *J Interprof Care* 2005, 19 Suppl 1:60-75.
54. Fleet LJ, Kirby F, Cutler S, Dunikowski L, Nasmith L, Shaughnessy R: Continuing professional development and social accountability: A review of the literature. *J Interprofessional* 2008, 22(s1):15-29.
55. Forsetlund L, Bjorndal A, Rashidian A, Jamtvedt G, O'Brien MA, Wolf F, Davis D, Odgaard-Jensen J, Oxman AD: Continuing education meetings and workshops: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev* 2009(2):CD003030.
56. Col N, Bozzuto L, Kirkegaard P, Koelewijn-van Loon M, Majeed H, Jen Ng C, Pacheco-Huergo V: Interprofessional education about shared decision making for patients in primary care settings. *J Interprof Care* 2011, 25(6):409-415.
57. McNair R, Brown R, Stone N, Sims J: Rural interprofessional education: promoting teamwork in primary health care education and practice. *Aust J Rural Health* 2001, 9 Suppl 1:S19-26.
58. Southernwood J: Distance learning: the future of continuing professional development. *Community Pract* 2008, 81(10):21-23.
59. Eriksson K: The alleviation of suffering--the idea of caring. *Scand J Caring Sci* 1992, 6(2):119-123.
60. Arman M, Ranheim A, Rydenlund K, Rytterström P, Rehnsfeldt A: The Nordic Tradition of Caring Science: The Works of Three Theorists. *Nurs Sci Q* 2015, 28(4):288-296.
61. Dahlberg K: *Health and caring: in theory and practice. [Sweden] Hälsa och vårdande : i teori och praxis*. Stockholm: Natur & Kultur; 2010.

62. Eriksson K: *The idea of caring. [Sweden] Vårdandets idé*. 1. uppl. edition. Stockholm: Stockholm : Liber AB; 1997.
63. Martinsen K: *Care and vulnerability*. Oslo: Akribe forlag; 2006.
64. Infovoice/ R & D/ [Sweden] FoU [<http://www.infovoice.se/fou/>, <http://science-network.tv/>]
65. Arman M, Dahlberg, K. & Ekebergh, M.: *Theoretical foundations for caring sciences. [Sweden] Teoretiska grunder för vårdande*. 1. uppl. edition. Stockholm: Stockholm : Liber; 2015.
66. Delva D, Jamieson M, Lemieux M: Team effectiveness in academic primary health care teams. *J Interprofessional* 2008, 22(6):598-611.
67. Freeth D: *Effective interprofessional education : development, delivery, and evaluation*. Oxford: Oxford : Blackwell Pub.; 2008.
68. Berggren E, Odlund Olin A, Orrevall Y, Strang P, Johansson SE, Tornkvist L: Early palliative home care: Evaluation of an interprofessional educational intervention for district nurses and general practitioners about nutritional care. *SAGE Open Med* 2017, 5:2050312117726465.
69. Barr H: Toward a theoretical framework for interprofessional education. *J Interprofessional* 2013, 27(1):4-9.
70. Reeves S, Perrier L, Goldman J, Freeth D, Zwarenstein M: Interprofessional education: effects on professional practice and healthcare outcomes (update). *Cochrane Database Syst Rev* 2013, 3:CD002213.
71. Reeves S: An overview of continuing interprofessional education. *J Contin Educ Health Prof* 2009, 29(3):142-146.
72. Ekebergh M: A learning model for nursing students during clinical studies. *Nurse Education in Practice* 2011, 11(6):384-389.
73. Biggs J, Tang C (Eds.): *Teaching for Quality Learning at University*: The McGraw-Hill Companies; 2011.
74. Biggs JB, Collis KF: *Evaluating the quality of learning : the SOLO taxonomy (Structure of the observed learning outcome)*. New York: Academic Press; 1982.
75. European Association for Quality Assurance in Higher Education E: Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG). (2015). . 2015.
76. Mauffette-Leenders LA, Erskine JA, Leenders MR: *Learning with cases*. London [Ont.]: Richard Ivey School of Business, The University of Western Ontario; 1997.
77. Tripathy MR: Case Methodology for Adult Learning: A Critical Review of Theory and Practice. *Asian Journal of Management Cases* 2008, 5(1):5-19.
78. Nordquist J, Johansson L: *Teaching with cases in health care. Att undervisa med case i utbildningar inom hälso- och sjukvården* Stockholm: Karolinska Institutet, Mecical Care Centre; 2009.
79. Drennan J: Cognitive interviewing: verbal data in the design and pretesting of questionnaires. *J Adv Nurs* 2003, 42(1):57-63.

80. Collins D: Pretesting survey instruments: an overview of cognitive methods. *Qual Life Res* 2003, 12(3):229-238.
81. Guigoz Y: The Mini Nutritional Assessment (MNA) review of the literature--What does it tell us? *J Nutr Health Aging* 2006, 10(6):466-485; discussion 485-467.
82. Evans WJ, Morley JE, Argiles J, Bales C, Baracos V, Guttridge D, Jatoi A, Kalantar-Zadeh K, Lochs H, Mantovani G *et al*: Cachexia: a new definition. *Clin Nutr* 2008, 27(6):793-799.
83. Berggren E, Orrevall Y, Ödlund Olin A, Strang P, Szulkin R, Törnkvist L: Evaluation of a Continuing Educational Intervention for Primary Health Care Professionals about Nutritional Care of Patients at Home. *J Nutr Health Aging* 2016, 20(4):428-438.
84. Vellas B, Guigoz Y, Garry PJ, Nourhashemi F, Bennahum D, Lauque S, Albareda J-L: The mini nutritional assessment (MNA) and its use in grading the nutritional state of elderly patients. *Nutrition* 1999, 15(2):116-122.
85. Nordquist J, Sundberg K, Johansson L: *Case -tools for professional learning. Verktyg för professionell lärande (SWE)*. Stockholm: Liber AB; 2011.
86. Charmaz K (Ed.): *Constructing grounded theory*. (2nd ed.) edition. London: Sage Publications; 2014.
87. Creswell JW: *Qualitative inquiry and research design : choosing among five approaches*. 3., [updated] ed. edition. Thousand Oaks: Thousand Oaks : SAGE Publications; 2013.
88. Cronbach LJ: Coefficient alpha and the internal structure of tests. *Psychometrika* 1951, 16(3):297-334.
89. Gliem JA, Gliem R: Calculating, Interpreting, and Reporting Cronbach's Alpha Reliability Coefficient for Likert-Type Scales. 2003.
90. Rothman KJ: No adjustments are needed for multiple comparisons. *Epidemiology* 1990, 1(1):43-46.
91. Benjamini YH, Y.: Controlling the False Discovery Rate: A practical and Powerful Approach to Multiple Testing. *Journal of the Royal Statistical Society: Series B (Methodological)*, 1995, 57(1):289-300.
92. Pilåker von Zelowitz K. PHM, Modin S., Ödlund Olin A., Faxén Irving G., Törnkvist L.: District nurses prevention and treatment of undernutrition among the elderly in basic home care. Effects of cooperation with a nutritional team. Edited by Stockholm county council Cfa. Stockholm: Karolinska Institutet; 2008.
93. Thornberg R: Informed Grounded Theory. *Scandinavian Journal of Educational Research* 2011, 56(3):243-259.
94. World Medical Association: Declaration of Helsinki Ethical Principles for Medical Research Involving Human Subjects. *Volume 310 (20)* Edited by JAMA; 2013:2191–2194.
95. Cook DA, Steinert Y: Online learning for faculty development: a review of the literature. *Med Teach* 2013, 35(11):930-937.
96. Berggren E, Strang P, Orrevall Y, Ödlund Olin A, Sandelowsky H, Törnkvist L: Evaluation of ConPrim: A three-part model for continuing education in primary health care. *Nurse Educ Today* 2016, 46:115-120.

97. Menard P, Varpio L: Selecting an interprofessional education model for a tertiary health care setting. *J Interprof Care* 2014, 28(4):311-316.
98. Thistlethwaite J, Kumar K, Moran M, Saunders R, Carr S: An exploratory review of pre-qualification interprofessional education evaluations. *J Interprofessional* 2014, 29(4):292-297.

12 APPENDIX

The three topic areas and the statements in each area that formed the basis of the analyses in studies II and III.

1. Statements assessing DNs' and GPs' *perceived familiarity* with information important to nutritional care in a palliative phase.

I am familiar with...

1. WHO's definition of palliative care
2. The meaning of the four dimensions of palliative care (physical, psychological, social, spiritual/existential)
3. The meaning of the four cornerstones that form the basis of palliative care (teamwork, symptom relief, communication and support of those close to the patient)
4. The meaning of the early and the late palliative phase
5. The importance of communication with patients (and those close to them) about critical transition points in the continuum of care
6. How nutritional care is individually planned on the basis of the patient's current palliative phase
7. How the MNA (Mini Nutritional Assessment) tool is used to assess the patient's nutritional status
8. How I can communicate about and advise against nutritional support (specific nutritional products) when death is approaching
9. How to distinguish the differences between nutritional needs in the early and the late palliative phase so I can explain these differences to the patient
10. How food and meals for patients in the early palliative phase should be adapted to suit the patient's individual nutritional problems
11. The importance of between-meal snacks, such as ready-to-drink oral nutritional supplements, for patients in the early palliative phase
12. The importance of symptom relief in facilitating eating for patients who are in a palliative phase and who have nutritional problems
13. The physical, psychological, social and existential consequences that can result from nutritional problems
14. Determining when the nutritional treatment no longer is appropriate for patients in the late palliative phase

2. Statements assessing the DNs' and GPs' *perceived collaboration* with other caregivers with regard to patients' nutritional problems and needs.

I cooperate with ...

15. Others at my place of work regarding patients who are in a palliative phase and who have nutritional problems
16. Those close to the patient on issues about food, regarding patients in the early or late palliative phase who have nutritional problems
17. Specialized palliative care teams regarding patients who are in a palliative phase and who have nutritional problems
18. Social assistance care workers regarding issues about food for patients who are in a palliative phase and who have nutritional problems

3. Statements assessing the DNs' and GPs' *level of knowledge* about important aspects of nutritional care.

19. A normal BMI rules out undernutrition*
20. Cachexia is the same as starvation*
21. It is common for patients in the early palliative phase to have nutritional problems
22. The MNA should be used to assess nutritional status and risk of undernutrition in all patients who are in the early palliative phase
23. In the late palliative phase, focusing on calorie intake can lead to stress for the patient and those close to the patient
24. In the late palliative phase of life, energy and nutrient intake is no longer expected to lead to improved nutritional status
25. In the late palliative phase, fatty and protein-rich foods can cause the patient to feel nausea
26. For patients in the late palliative phase who are receiving enteral or parenteral nutrition, the goal can be to discontinue or reduce enteral or parenteral nutrition
27. When the patient is receiving basic home health care, it is the responsibility of primary health care professionals to identify, assess, investigate and treat the patient's nutritional problems
28. In basic home health care it is the district nurse's responsibility to assess the patient's ability to eat and drink as well as any need for help with eating and mealtime companionship
29. In basic home health care it is the district nurse's responsibility to assess the patient's dining area and eating environment
30. In basic home health care, it is the general practitioner's responsibility to ensure that the patient's medication has as little impact as possible on the patient's appetite and ability to eat
31. In basic home health care, teamwork is important to good nutritional care
32. In my work in basic home health care, I often meet patients in the early palliative phase who have nutritional problems

Responses (Likert response scale) ranged from "fully agree" (score: 4) to "mainly agree" (score: 3), "partly agree" (score: 2) and "do not agree at all" (score: 1). The greater the agreement with the positive statement, the higher the scores. For all but for the statements 19 and 20, where the scale was reversed.