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EVIDENCE-BASED CARE OF OLDER PEOPLE – UTOPIA OR REALITY?

Healthcare personnel's perceptions of
using research in their daily practice

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ABSTRACT

EVIDENCE-BASED CARE OF OLDER PEOPLE – UTOPIA OR REALITY?

Healthcare personnel's perceptions of using research in their daily practice.

The overall aim of this thesis was to generate knowledge of research utilization of registered nurses (RNs) and other healthcare personnel in the care of older people. The specific objectives for the four included papers were: (I) to describe the perception of healthcare personnel with respect to research utilization and to compare research use between professional groups, (II) to identify determinants of research utilization, (III) to describe RNs' self-reported research use in the care of older people and to examine the associations between research use and factors related to the communication channels, the adopter and the social system and (IV) to describe RNs' perceptions of barriers to and facilitators of research utilization and to examine the validity of the BARRIERS Scale in relation to research use, i.e. the capacity of the Scale to discriminate perceptions of barriers between research users and non-research users. Method: A descriptive correlational survey design was used. The first study (Papers I-II) was performed in one municipality. Seven units within rehabilitation (n=1), nursing homes (n=2) and group dwellings (n=4) were selected. All healthcare staff (n=132) were asked to participate. The response rate was 67% (n=89). The second study (Papers III-IV) was conducted in eight municipalities. In these municipalities all RNs (n=210) working in the care of older people were invited. The response rate was 67% (n=140). Five questionnaires were used to collect data: the Research Utilization Questionnaire (Papers I-IV), the Creative Climate Questionnaire (Paper II), the BARRIERS Scale (Paper IV), a Demographic Data Questionnaire (Papers I-IV) and an Organizational Data Questionnaire (Paper III). Data were analyzed using descriptive and inferential statistics. The PARISH framework and Rogers' theory Diffusion of Innovations were used to interpret the findings. Results: The healthcare staff reported positive attitudes to research but low use of research findings. Limited access to research-related resources and lack of support from unit managers and colleagues were reported. RNs and rehabilitation professionals (RPs) reported more research use than enrolled nurses (ENs) and nurse aides (NAs). Furthermore, the RNs and RPs reported better access to resources and perceived managers as more supportive as compared with the ENs and NAs. RNs with access to research and development resources at the municipal level reported more use of research findings than RNs without such resources. Four determinants of research use among staff were identified: positive attitudes to research and seeking research that is related to clinical practice (individual determinants) and access to research findings at the workplace and support from the unit manager (organizational determinants). In the RN group three determinants of research use were revealed: access to research findings (the communication channels), attitudes to research and having a nursing program at the university level (the adopter). The barriers to research utilization reported by the RNs were predominantly related to characteristics of the organization and the presentation and accessibility of research. More than 80% of the RNs reported a lack of knowledgeable colleagues, a lack of adequate facilities for implementation and a lack of easy access to relevant research papers. Research users among the RNs reported fewer barriers concerning their own attitudes and skills, presentation of research and the quality of research than non-research users. No significant difference was found between research users and non-research users regarding perceptions on organizational barriers.

This thesis not only reveals the needs but also the potential of increasing research use in the care of older people. The healthcare staff reported a lower degree of research use and the RNs reported more barriers to research utilization compared with nurses in earlier studies conducted in hospitals. There is an urgent need to develop strategies to enhance research use by focusing on the determinants and barriers identified in this thesis, which include access to information sources, interventions for increasing knowledge on research methodology and caring science, adequate training in the use of information sources and a supportive organization. The BARRIERS Scale appears to be useful in identifying some types of barrier except organizational barriers. Identified barriers, however, were general and wide-ranging, making it difficult to design specific interventions. Based on the present findings, it should not be a utopia to provide older people with evidence-based care. The responsibility for such an objective is shared by many actors in the healthcare and university systems. To achieve this goal allocated resources have to be used strategically.

Key words: Research utilization, evidence-based practice, registered nurses, healthcare staff, care of older people, barriers to research utilization, Rogers' theory Diffusion of Innovations

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LIST OF PUBLICATIONS

This doctoral thesis is based on the following original papers, referred to in the text by their Roman numerals:

- I. Boström A-M, Wallin L, Nordström G.
Research use in the care of older people: a survey among healthcare staff.
International Journal of Older People Nursing, 2006: 1,131-140.
- II. Boström A-M, Wallin L, Nordström G.
Evidence-based practice and determinants of research use in elderly care in Sweden.
Journal of Evaluation in Clinical Practice, 2007: 13(4), 665-673.
- III. Boström A-M, Nilsson Kajermo K, Nordström G, Wallin L.
Registered nurses' use of research findings in the care of older people.
Submitted
- IV. Boström A-M, Nilsson Kajermo K, Nordström G, Wallin L.
Barriers to research utilization and research use among registered nurses in the care of older people: a cross-sectional survey.
Submitted

APPENDIX

- V. Boström A-M, Nilsson Kajermo K, Thompson DS, Estabrooks CA, Wallin L.
A systematic review of studies using the BARRIERS Scale.
Submitted

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LIST OF ABBREVIATIONS

CCN	Community Chief Nurse
CCQ	Creative Climate Questionnaire
EBM	Evidence-based medicine
EBP	Evidence-based practice
EN	Enrolled nurse
EROS	Edmonton Research Orientation Survey
NA	Nurse aide
NBHW	The National Board of Health and Welfare
NPQ	Nurse Practice Questionnaire
PARIHS	Promoting Action on Research Implementation in Health Services
R&D	Research and development
RN	Registered nurse
RP	Rehabilitation professional (i.e. physiotherapist, occupational therapist, etc.)
RU-index	The index from the RUQ measuring research utilization in daily practice
RUQ	Research Utilization Questionnaire
SALAR	The Swedish Association of Local Authorities and Regions
SBU	The Swedish Council on Technology Assessment in Health Care (Swedish acronym)

1 INTRODUCTION

The development of knowledge in geriatric medicine, nursing and allied health has increased rapidly in recent years. The Swedish Council on Technology Assessment in Health Care (SBU) and the National Board of Health and Welfare (NBHW) have published systematic reviews and national guidelines for supporting dissemination of scientific findings [1-5]. The NBHW will publish national guidelines on the care of persons suffering from dementia next year [6]. Hence, the scientific base on which to provide evidence-based practice in the care of older people exists. There are also laws and regulations covering all health-care personnel in Sweden emphasizing the obligation to provide care in accordance with science and proven experience [7]. Further, most healthcare professions have ethical guidelines, which imply that these professionals have a responsibility to be 'up-dated' in current knowledge. Despite these circumstances, studies have shown that current national guidelines are not used by healthcare staff or that the healthcare staff is not even aware of these guidelines [8, 9]. This is not just a Swedish phenomenon: the issue of dissemination and implementation of adequate knowledge in healthcare is recognized worldwide. International studies have revealed that 30-40% of patients do not receive care according to current evidence and that 20-25% of the care that is provided is not needed or is even potentially harmful [10].

The overall aim of this doctoral project was to generate knowledge on the use of research in the care of older people by registered nurses (RNs) in particular as well as other healthcare personnel. As in many other countries, Sweden has an aging population [11]. Since 1992, most of the care of older persons has been transferred from hospitals to homes and nursing homes that are provided by the municipalities [12]. In older people care 80-90% of healthcare staff is enrolled nurses (ENs) and nurse aides (NAs), of whom many (about 40%) do not have recommended nursing training. Moreover, access to resources for practice development and in-service training for these caregivers is limited [13]. Regardless of changes in organization and the skill-mix of healthcare staff, society and older persons will expect and demand high-quality care based on evidence. Considering these conditions is it realistic to suggest that the care of older people will be an evidence-based practice or is that merely a utopia?

2 BACKGROUND

2.1 EVIDENCE-BASED PRACTICE AND RESEARCH UTILIZATION

The Evidence-Based Medicine Working Group first introduced the concept of evidence-based practice (EBP) in 1992 [14]. This group was highly influenced by A.L. Cochrane, who was committed to the notion that practitioners (physicians) should use effective treatments in their care of patients [15]. As early as 1975 Cochrane claimed in his book “Effectiveness & Efficiency Random reflections on Health Services” that research findings had to be systematically evaluated in order to determine the most effective treatment, because doing so would result in a more effective and efficient treatment process (e.g., the mortality rate would decrease). Since Cochrane and the Evidence-Based Medicine Working Group initiated this debate, EBP has been a widespread concept in healthcare, where its strengths and limitations have been extensively discussed over the years [16]. The spokespersons of EBP often highlight the potential risk of doing harm and limiting the quality of care for patients if healthcare staff personnel do not use evidence in clinical practice. In contrast, the antagonists often point to the risk of reducing medicine and nursing to ‘cook book’ based care, which inappropriately simplifies the knowledge needed and the decision-making processes in healthcare.

The same year as Cochrane released his book, one of the first studies on nurses’ utilization of research findings was published [17]. Ketefian investigated nurses’ knowledge of measuring the temperature by oral route. The nurses in Ketefian’s study were not aware of these research results, although the findings were published in several nursing journals. Since Ketefian, many studies have examined research utilization in nurses with a special growth in the late 1990s [18]. At this time, the ‘movement’ of evidence-based nursing was initiated because now there were a sufficient number of published nursing studies to make it possible to synthesize research findings into systematic reviews. The journal Evidence-Based Nursing launched its first issue in 1998.

In the following sections an overview of evidence-based practice and research utilization, including definitions, measurements and nurses’ use of research findings, is presented, as well as a description of some aspects on the care of older people in Sweden.

2.1.1 Definitions of research utilization and evidence-based practice

Research utilization in nursing has several definitions. Polit & Hungler define research utilization as “the use of some aspects of a scientific investigation in an application unrelated to the original research” [p. 645, 19]. Estabrooks et al. define research utilization as “the process by which specific research-based knowledge (science) is implemented in practice” [p. 3, 20]. The overall assumption is that the use of research findings will improve the quality of care and patient outcome. The use of research has also been seen as a means for the professionalization for nurses [21, 22]. Researchers have suggested that different types of research utilization exist. Instrumental utilization (or direct utilization) is the concrete application of research findings, often in the form of guidelines or protocols, to support decision-making in practice [23-25]. Conceptual research utilization (or indirect utilization) affects the person’s thinking, but not necessarily the person’s actions [23-25]. In symbolic utilization (or persuasive utilization) research findings are used to convince others about an idea or legitimize a position [23-25]. Overall research utilization is proposed to be the use of any kind of research findings in any way and can be viewed as a composite of the three previous described types of research utilization [25].

Sackett et al. described evidence-based medicine (EBM) as “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research” [p. 2, 26]. EBM has also been defined as a process that, from a defined question, seeks out relevant knowledge and then critically appraises and compiles this knowledge, and finally, implements the results of this appraisal in clinical practice [26]. There are several similarities between EBP and research utilization, including the goal of improving patient care by applying scientific findings in clinical practice and the process-oriented approach. There are also some differences (e.g., how the concept ‘evidence’ should be defined). Rycroft-Malone et al. argued that evidence should not be limited to scientific knowledge, i.e. it should also include clinical experiences of healthcare staff, patient preferences and data from quality improvement and local databases [27]. Others (e.g., Scott-Findlay & Pollock) claimed that the term evidence should be restricted to research findings and that the term knowledge should be used in a broader sense [28].

In this field (as in many others) several conceptualizations of the same phenomenon have appeared in the literature. There is also an interchange of terms as well as a development of new terms [25, 29]. Estabrooks posits that EBP is more extensive than research utilization in the sense that it includes other knowledge forms in addition to scientific findings [25]. Thus, research utilization is an element of EBP. Graham et al. highlight that many terms are used for describing the movement of knowledge into action (e.g., knowledge translation, knowledge transfer, knowledge exchange, implementation, diffusion and dissemination) [29]. In this thesis the term research utilization is used, where my interest is to investigate the use of scientific findings (research results) as a part of EBP.

2.1.2 Theoretical frameworks of research utilization

Since the 1970s, several theoretical frameworks of research utilization for supporting implementation and evaluation of research in practice have been developed [18]. During the 1990s, models such as the Horn Model by Goode & Bulechek [30], the Iowa model of research in practice by Titler and co-workers [31] and the Stetler model [24] have been published. According to Estabrooks et al., one common characteristic of most research utilization models for nursing is the assumption that, regardless of the context, the healthcare staff acts as a rational decision-maker [18]. With the conceptual framework Promoting Action on Research Implementation in Health Services (PARIHS), Rycroft-Malone et al. proposed another approach, i.e. an approach that focuses on the context instead of the individual [32]. Evidence, context and facilitation are suggested to constitute three key elements for successful implementation of research into health care. The basic assumption of this group is that research uptake is a complex process in which these three key elements take part in a dynamic relationship. The key element Context focuses on organizational aspects (such as leadership, organizational culture and performance feedback systems) and the key element Facilitation is the primary intervention suggested to support implementation of evidence.

There exist many diverse theories in the research utilization field [33]. One of the most used theories is Rogers’ “Diffusion of Innovations” [34]. Rogers defined diffusion as “the process in which an *innovation* is *communicated* through certain *channels* over *time* among the members of a *social system*” [p. 5, 34]. The four main elements involved are innovation, communication channels, time and the social system. The innovation is, according to Rogers, an idea, practice or object that is perceived as new by individuals or groups, i.e. innovations are not restricted to research findings. The communication channels (e.g., mass media and interpersonal channels) are the means by which messages pass from one individual to another. The time element is part of the innovation-decision process (which is described in five steps: knowledge, persuasion, decision, implementation and confirmation) by which a person proceeds from the initial

knowledge of an innovation to its adoption or rejection. Rogers also describes innovativeness “as the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a system” [p. 22, 34]. According to the concept of innovativeness, members of a social system could be classified as (1) innovators, (2) early adopters, (3) early majority, (4) late majority and (5) laggards. Therefore, this element is often labeled as ‘the adopter or the individual’. The social system is the organization of the members that are involved to solve common problems and reach a shared goal. It concerns the structure and norms of the organization and has members with various functions, including opinion leaders and change agents.

2.1.3 Measurements of research utilization

To develop programs for promoting research use, researchers have used diverse methods to study nurses’ use of research in general, or use of specific findings/nursing practices, as well as factors that support or hinder research uptake. The most common way to measure research utilization has been the use of questionnaires though such qualitative methods as interviews and observations have increased lately [18]. The three most common questionnaires are the Nurse Practice Questionnaire (NPQ), the Research Utilization Questionnaire (RUQ) and the Edmonton Research Orientation Survey (EROS) [20]. The NPQ measures nurses’ awareness and utilization of specific research findings/nursing practices, whereas the RUQ and the EROS measure nurses’ overall use of research findings.

The NPQ was developed by Brett in 1987 and is based on Rogers’ Diffusion of Innovation theory [35]. It measures the respondent’s level of awareness, persuasion, decision, implementation and confirmation regarding a number of specific nursing practices. This instrument has been further developed and used in 10 published articles [35-44]. One of these studies is a Swedish study of midwives [41]. The RUQ was published in 1989 by Champion and Leach [45]. In addition to the use of research findings in daily practice, the instrument measures the respondent’s attitude to research, support from the setting and the availability of research. The original paper on this instrument does not present any specific theoretical underpinning related to research utilization [45]. The RUQ has been further developed and used in four studies of nurses working in hospitals in the United Kingdom and Canada and in one study of occupational therapists in the UK. The instrument is translated into Swedish and has been used in two Swedish studies: one of RNs working in hospitals and one of dental hygienists (Table 1). Totally, eight articles have been published using the RUQ [45-52]. The EROS, developed by Pain et al., is designed to measure research use and attitudes toward research and research utilization [53]. It comprises four subscales: valuing research, research involvement, being at the leading edge and evidence-based practice. No specified theory on research utilization has guided the development of EROS. The instrument has been used in seven published papers [53-59].

To measure the four types of research utilization (i.e. instrumental, conceptual, symbolic and overall) Estabrooks has developed four single items, one for each type [25]. Results from studies using this single item instrument, the Research Utilization Survey, have been presented in seven articles [25, 60-65]. In some other studies researchers have used a single item, which asks the respondents on their use of research findings in practice [20].

2.1.4 Nurses’ use of research findings in clinical practice

The first studies on research utilization revealed that nurses had a moderate awareness and low use of research findings. In the study by Brett, 279 nurses were asked about their awareness and use of 14 suggested nursing practices [35]. Nearly all of the nurses were aware of two of the 14 nursing practices. These two practices were about closed sterile urinary drainage and intravenous site change (i.e. removal of the intravenous

cannula within 48 hours). Most (79%) of the nurses reported “always” using closed sterile urinary drainage while less than one third (27%) of the nurses reported “always” using intravenous change. Less than half of the nurses were aware of four of the 14 nursing practices (from 9-21% of the nurses reported “always” using the four nursing practices). In a recent study by Squires et al., more than 80% of staff nurses reported awareness of policies and procedures (P&P) on flushing peripheral locks, urinary catheter care and using graduated compression stockings [44]. More than 70% of the nurses reported “always” using two of the P&P (flushing peripheral locks and urinary catheter care) and nearly 60% reported that they sometimes use P&P regarding compressions stockings. It seems that nowadays nurses are more aware of research results than they were earlier; however, this increased awareness still implies moderate and diverse use (from always to seldom) of these findings in clinical practice.

The eight studies using the RUQ reported a diverse use of research findings in daily practice (Table 1). The highest mean value on the research use index was reported by British nurses [49] and the lowest mean value was reported by RNs in a Canadian hospital [51]. Remaining articles reported mean values between 3.3 and 3.5, indicating some use of research findings (Table 1). Nurses also reported a wide range of implementation of specific research findings, from 74% of diabetes nurse specialists in UK [47] to 16% of Swedish RNs [52] (Table 1). The studies using the EROS also reported nurses’ low use of research findings in general even if the nurses reported a positive attitude toward research [54-57].

The studies on nurses’ use of diverse types of research utilization have shown that nurses reported more conceptual utilization of research findings than instrumental utilization [25, 63, 65, 66]. Comparing groups of nurses (i.e. staff nurses, nurse educators and nurse managers) revealed that nurse educators reported higher research use on all types of research utilization compared with staff nurses and managers [65]. Educators and managers reported higher symbolic research utilization than staff nurses.

2.1.5 Factors related to research utilization

Various factors are suggested to influence research utilization (both positively and negatively). The factors are presented according to the four main elements in Rogers’ theory - the innovation, the communication channels, the adopter and the social system.

Researchers have discussed at length how the characteristics of the research itself might relate to nurses’ research use [32, 34, 67, 68]. Strangely as it seems, the research itself has been perceived to be a barrier to research utilization. This perplexity is a consequence of methodological inadequacies, conflicting research findings and nurses’ uncertainty if they can trust research findings [68]. Rogers suggested that several aspects (e.g., complexity, relative advantage, compatibility, observability and trialability) of the innovation (i.e. research) will significantly influence the diffusion [34]. These aspects of research findings have not been investigated to any greater extent in studies on research utilization in nursing [67]. The diverse uptake of different research findings among nurses might be explained by the easiness of research findings to be put into practice without new resources or by making a directly visible difference.

Access and use of research-based information sources are key elements for the dissemination of research findings. Nurses working in hospitals often reported having access of diverse information sources, such as libraries, textbooks, policies and protocols and journals [47, 52, 69]. To deal with clinical problems or uncertainty at the unit level nurses preferred ‘human’ sources, such as clinical nurse specialists and link nurses instead of ‘evidence-based technology’ [69]. Furthermore, the nurses choose local and clinically focused information sources (e.g., guidelines and protocols), which were linked directly to the unit. Corresponding preferences were found among Canadian nurses who preferred using knowledge gained by personal experience and interactions with colleagues. The least information sources used were scientific journal articles and textbooks [70].

Table 1. List of studies using the Research Utilization Questionnaire.

	Champion & Leach 1989	Lacey 1994	Hatcher & Tranmer 1997	Humphris et al. 1999	Humphris 2000	Tranmer et al. 2002	Wallin et al. 2003	Öhrn et al. 2005
Country	USA	UK	Canada	UK	UK	Canada	Sweden	Sweden
Setting	Hospital	Hospital	Hospital	Trusts	Trusts	Hospital	Mainly hospitals	Dentistry
Sample	59 RNs	20 RNs	174 nurses	299 Diabetes nurse specialists (DNS) 133 RNs	66 occupational therapists	Pre 92 RNs Post 88 RNs	46 RNs sustained Quality improvement 72 RNs did not sustain Quality Improvement	148 dental hygienists (2 yrs education) 113 dental hygienists (1 yr education)
Research use index ¹	3.48	3.79	3.42	Not reported	Not reported	2.98 – 3.46 ³	3.33 QI	3.5 2 yrs
Attitude to research index ¹	3.93	4.00	3.77	Not reported	Not reported	3.40 – 3.89 ³	3.06 non-QI	3.3 1 yr
Support index ¹	3.54	3.13	3.52	Not reported	Not reported	2.86 – 3.20 ³	4.07 QI	4.1 2 yrs
Availability index ¹	2.90	3.60	3.31	Not reported	Not reported	2.82 – 3.13 ³	3.89 non-QI	3.8 1 yr
Support/Availability index ^{1,2}							3.79 QI	3.3 2 yrs
I use research findings (agree)	Not reported	Not reported	Not reported	Not reported	50%	Not reported	3.43 non-QI	3.6 1 yr
Implement specific findings (yes)	Not reported	Not reported	Not reported	Not reported	74% DNS 62% RNs	23%	62%	Not reported
Read research in journals (yes)	Not reported	Not reported	Not reported	Not reported	94% DNS 91% RNs	86%	46% QI	41% 2 yrs
Support from unit manager (agree)	Not reported	Not reported	Not reported	Not reported	80%	Not reported	16% non-QI	30% 1 yr
Support from colleagues (agree)	Not reported	Not reported	Not reported	Not reported	62%	Not reported	79% QI	78% 2 yrs
Access to library (yes)	Not reported	Not reported	Not reported	Not reported	91% DNS 93% RNs	95%	67% non-QI	86% 1 yr
Access to Internet (yes)	Not reported	Not reported	Not reported	Not reported	41% DNS 36% RNs	53%	65%	Not reported
Access to research findings at work place (agree)	Not reported	Not reported	Not reported	Not reported	67%	Not reported	90% QI	Not reported
							58% non-QI	

¹ 5-point scale, 1= strongly agree 2= agree 3= do not know 4=disagree 5=strongly disagree

² the support index and the availability index were merged into one index in the Swedish version of the instrument

³ the highest and lowest value reported on the index

QI= sustained Quality Improvement

non-QI= did not sustain Quality Improvement

Factors related to the individual have been intensively investigated in the nursing literature. In a systematic review 104 articles were found, of which 22 met the review's inclusion criteria [71]. Six categories of potential individual determinants of research utilization were identified. The categories were labeled beliefs and attitudes towards research, involvement in research activities, information seeking, education, professional characteristics and other socio-economic factors. The only factor with a consistent pattern of a positive relationship with research use was beliefs and attitudes.

Several organizational factors have been proposed as having an effect on research utilization, including organizational complexity, centralization of decision-making and authority, organizational size, presence of a champion, traditionalism, organizational slack, lack of time, access to research and resources, professional autonomy and organizational support [72]. Leadership and an organizational culture or climate that value research and research utilization are also suggested to influence research use in clinical practice [73-78]. In a systematic review examining the relationship between contextual factors and research utilization in nursing the following six factors were reported: the role of the nurse, multi-faceted access to resources, organizational climate, multi-faceted support, time for research activities and provision of education [79]. However, the authors concluded that the studies were of low quality and the associations of contextual factors with research utilization are largely unknown. In a recently published paper Cummings et al. reported findings from a study evaluating a theoretical model building on the PARIHS framework [80]. The authors found that context, according to the PARIHS framework, is important to nurses, to research use and to outcomes for patients and staff. A responsive administration and relational capital (i.e. collaboration among nurses) were found to influence the research utilization of nurses.

Numerous studies have investigated associations between a number of factors and research utilization. There are some common findings in these studies. Positive attitudes to research, supportive leadership and organizational climate, access to research-related resources and information sources have been found to have a positive association with research uptake. However, there is a lack of knowledge on how identified factors interact with each other, especially the interaction between levels in the organization [81]. Research utilization takes place in complex organizations with interactions among several levels (e.g., individual, unit, department and hospital/municipality) and the healthcare personnel working in these complex organizations have diverse educational and professional backgrounds [82-84]. These conditions and interactions are poorly understood and challenging to investigate.

2.1.6 Barriers to research utilization and changing practice

To bridge the gap between 'the known and the done' a commonly suggested strategy is to identify barriers for changing practice and then implement interventions to reduce identified barriers. A Cochrane review by Shaw et al. identified 15 randomized controlled trials that had used this strategy [85]. Various approaches for identifying barriers were used and interventions for overcoming barriers were tailored to both the individual healthcare staff and the organization. Mostly, intervention arms of the included trials had a better outcome though a meta-analysis of six included trials was not statistically significant. In a multiple-case analysis by Bosch et al. similar findings to those of the Cochrane review were reported [86]. The authors selected 20 quality improvement studies reporting barrier analyses followed by tailored educational and organizational interventions. The identified barriers were categorized into five types of barrier that were related to patients, professionals, teams/social interactions, organizations and structures. However, few of the included studies used a consistent approach to link the improvement intervention to identified barriers. Accordingly, there was a mismatch between barriers and selected interventions. Some evidence supports the strategy to change practice by using tailored interventions to overcome barriers. Still, little is known about which barriers are valid, how these barriers should be identified and what interventions are effective for overcoming barriers.

Nurses' perceptions of barriers to research utilization have been extensively investigated [87]. Funk et al. published the questionnaire BARRIERS Scale in 1991 [68]. One underlying assumption of the BARRIERS Scale is that if barriers are reduced or eliminated, nurses' use of research will increase. The instrument's four subscales (the nurse, the setting, the research and the presentation) are supposed by Funk et al. to be congruent with Rogers' theory [34]. In a systematic review of studies using the BARRIERS Scale 39 published articles and six dissertations have been identified (Paper V). All studies, except two, used a cross-sectional design [73, 88]. In 37 studies the rank order of barriers was presented. The rank orders were derived from the percentage of study participants who agreed that an item represented a moderate to great barrier. In two studies the rank order was derived from the mean value of the items [89, 90]. From the 37 included studies, the rank order for each item was calculated. The most frequently reported barriers were: (1) There is insufficient time on the job to implement new ideas; (2) the nurse does not have time to read; (3) the statistical analyses are not understandable; (4) the nurse does not have enough authority to change patient care procedures; and (5) the facilities are inadequate for implementation.

The included studies were conducted in various settings (e.g., hospitals/primary care/community care) and specialities (e.g., medical, surgical). In two studies researchers compared perceptions of barriers between nurses in different settings or specialities [91, 92]. Nurses working in community care reported more barriers related to accessibility of research and resources for implementation as compared with nurses working in hospitals [91]. No significant differences were found between nurses working in medical and surgical wards [92]. Some researchers compared perceived barriers in different groups of nurses. Nurse managers appeared to report greater barriers related to the nurse subscale than staff nurses [93, 94]. In non-English speaking countries an item concerning the English language was added. This item has been found to be one of the five top barriers [95-97]. Overall, identified barriers were highly consistent across geographic location, time, setting, specialties and groups of nurses.

Only one study has investigated nurses' perception of barriers and reported research uptake [57]. The only significant association was between research use and the nurse subscale, indicating that nurses who reported more research use were less likely to recognize characteristics related to the individual nurse as barriers than nurses who reported research utilization to a lesser extent. If the BARRIERS Scale is valid, i.e., meet the basic assumption of its developers, then the Scale should discriminate perceptions of barriers between research users and non-research users. Are the barriers identified by this instrument related to nurses' use of research or are there other barriers that should be identified? The (so far) lack of support for associations between perceived barriers and research use raises questions about the validity of the Scale. In fact, in the UK the content and construct validity of the Scale has been questioned [98].

To summarize, since the 1970s, researchers have investigated nurses' use of research findings, various factors associated with research uptake among nurses and nurses' perceptions of barriers to research utilization. In general, nurses have reported positive attitudes to research; in fact, recent studies revealed a greater awareness of current research findings compared with previous studies. Yet, nurses reported a moderate use of research findings in practice. Individual factors (such as positive attitudes to research) and organizational factors (such as supportive leadership and organizational climate) are examples of identified determinants to research uptake. There are interactions between determinants that are not well understood and central determinants have probably not yet been identified. According to nurses, the organization and presentation of research are perceived as the most prominent barriers to research utilization. Thus, some knowledge exists on how to enhance nurses' research uptake. However, the studies on research utilization have mainly been conducted with nurses working in hospitals. The educational level of nurses (the skill-mix), the organization and the resources differ between hospitals and older people care facilities. We do not

know to what extent the knowledge that is generated from studies using samples with nurses working in hospitals is applicable in the care of older people.

2.2 THE CARE OF OLDER PEOPLE

An aging population is a worldwide trend in developed and developing countries [99]. In many countries the mortality rate has decreased, leading to a greater proportion of older persons. Providing care for older persons has therefore become an important topic in many countries.

2.2.1 The older population in Sweden

Sweden has one of the largest proportions of older people in the world [100]. In 2006, about 1.6 million people were aged 65 or older, which is 17% of the Swedish population. In 2030, the prognosis is that 2.3 million people will be 65 years or older and in 2050 2.5 million, i.e. 23-24% of the population will be aged 65 years or older. The “oldest old” (persons 80 years and older) is the group with the greatest needs with respect to social and health services. In 2005, this group consisted of nearly 500000 persons (5.4% of the population), but according to the prognosis, this group will increase to 763000 (7.6%) persons in 2030 and to 912000 (8.7%) persons in 2050. These figures point to the increasing needs and demands on the social and health care services for older persons [100].

2.2.2 The health of older people

The trend of the older population’s health has been investigated in several papers [101, 102]. Older persons, in general, are comparatively healthy in Sweden [101]. The most common diseases in old persons are high blood pressure, heart disease and heart failure, type 2 diabetes, infections and dementia. In the oldest old, stroke, osteoporosis, dementia, mental ill-health, impaired vision and hearing are the most common health problems. Thus, the proportion of persons with diseases or impairments increases with age. In 2005, about 142200 persons were diagnosed with dementia. However, only 2% of the age group 65-69 years suffered from dementia, whereas nearly 25% of persons in the age group 85-89 years were diagnosed with dementia. Dementia is a strong contributing factor for persons moving to nursing homes. Of the 142200 persons diagnosed with dementia, about 64500 are estimated to live in nursing homes [103]. Stroke is also a disease that is strongly correlated with age. The median age of stroke patients is 73 years for men and 77 years for women. However, advances in medicine have made it possible to decrease some of the impairments for older persons. For example, cataract is a common cause of impaired vision in older persons. However, in the past few years about 80000 cataract operations have been performed each year, greatly reducing the proportion of older persons with this disability [101]. Therefore, the health trends in the older population seem to both “getting better and getting worse” [102]. Findings from health-trend surveys in the elderly population revealed that even if disability measures often showed improvement, there was a concurrent increase in chronic disease and functional impairments. This latter finding might implicate an increased need for resources in medical care and rehabilitation.

2.2.3 The organization of older people care

Since 1992, there has been an alteration from hospital care to home-based care regarding the care of older people in Sweden. The municipalities are given the responsibility to provide all types of institutional housing and care facilities for older persons. Different specialties of special housings are mainly (1) nursing homes for older persons with medical and nursing needs, (2) group dwellings for persons suffering from dementia or other nursing needs and (3) rehabilitation units. In some municipalities there are units for day-care and respite-care. The county councils are

responsible for providing medical care at hospitals and in primary health care [12]. In 1989, the average length of stay in hospitals for people diagnosed with stroke was 56 days. Four years later (i.e. 1993) hospitalization had decreased to 16 days. Twelve years later (i.e. 2005) the average length of hospital stay was 6 days. In parallel, there has been a reduction of nearly 18000 beds/rooms in the nursing homes in the municipalities during the past five years. This reduction has led to an expansion of homecare. In 2000, 120900 persons received home care and five years later the corresponding figure was 135000 persons [13]. Thus, older persons receiving care under the responsibility of the municipalities in nursing homes are now more frail and dependent in terms of functional and cognitive capacity.

Because of the legislation [104] and political decisions of each municipality, the care of older people is organized in many different ways. One common feature, however, is that every municipality must have a Community Chief Nurse (CCN) [105]. This function is, among other things, to assure that guidelines and routines are set up in order to secure patient safety. The majority of employees in the care of older people are ENs and NAs. Nearly 260000 persons were employed (with a monthly salary) in medical and social services in the municipalities (including both nursing homes and social services in homes) in 2005 [100]. Of those, 185800 were employed as ENs and NAs, 12200 as RNs, 2700 as occupational therapists and 1400 as physiotherapists. More than 90% of healthcare staff in older people care were women and 24% were 55 years and older. Among the RNs, 30% were 55 years and older and only 10% were younger than 35 years. The turnover rate among healthcare staff, and especially RNs, has been rather high but in the past two years the rate decreased from 12 to 5% [100].

There is a national policy that all ENs and NAs in the care of older people should be trained in a 3-year nursing program within upper-secondary education [13]. In 2006, about 60% of the nursing staff (ENs and NAs) had this program or equivalent nursing training. Today, RNs and rehabilitation professionals (RPs) have a 3-year university education. Before 1982, the nursing program did not include research methodology and nursing science. Since 1982, the RNs were trained in a 2-year nursing program at a college/university and research methodology and nursing science were included in the curricula. In 1993, the nursing program was prolonged to three years [106] and within the 3-year nursing program at the university level, RNs can earn a Bachelor degree in Nursing. There are four specialist nursing program relevant for RNs working in the care of older people [107]. These are Elderly Care Nursing, Primary Health Care (Public health nurse), Psychiatric Care Nursing and General Health Care with an emphasis on surgical, medical or oncological nursing. In a survey from 2004, 40% of 300 RNs working in the care of older people had a relevant specialist nursing program [108].

Several studies have investigated the work situation of ENs and NAs [13, 109-112]. The ENs and NAs perceived the work as independent and rewarding but also causing mental and physical strain [109]. There was a lack of time to interact with the older person, which was reported as stressful [112]. The ENs and NAs reported lack of knowledge in medicine and nursing (e.g., knowledge on dementia and of other mental disorders and treatment of older persons suffering from those disorders) [110, 111]. Recent studies have shown that ENs and NAs experienced worse work-related health than other professional groups in municipalities and that high turnover among managers, large units and enhanced demands at work all functioned to increase sick leave among healthcare staff in the care of older people [13].

The work situation of RNs in older people care differs compared with the work situation of RNs in hospitals [113]. In older people care RNs have a supervising role, performed through visiting the clients/patients in their home, making assessments, planning care and evaluating provided care. The RNs instruct ENs and NAs on how to carry out the planned care of the clients/patients [114]. This role requires high medical, nursing and pedagogical competence, as well as personal life experience [115]. The co-workers to RNs in older people care (e.g., ENs, NAs, care managers and physicians) have diverse expectations on the RNs' role and function, making the RNs' work situation stressful [116]. In a Swedish study RNs working in the care of older people

expressed discontent with their work situation because of lack of time, poor stimulation and little support from managers. Overall, they emphasized the importance of a supportive organization [117]. Another Swedish study showed that RNs working in dementia care settings perceived better support from management and fellow workers as compared with RNs working in general elder care [118].

The combination of an aging population and a shortage of RNs initiated a discussion on how to organize the work of RNs. Traditionally, RNs have been working as a team member in nursing homes together with the ENs and NAs. A new organization has been applied where RNs have the role of consultant to the ENs and NAs. The RNs have their own unit 'outside' the nursing homes and their managers are by background RNs. This organization is considered advantageous because instead of working solely with ENs and NAs, the RNs have several professional colleagues with whom they are able to discuss and improve nursing care [114]. Although this new organization has been implemented in several municipalities in Sweden, no evaluation of its effect on patient safety and quality of care has yet been performed [13].

2.2.4 The quality of older people care

In Sweden, there are 57 national quality registries in healthcare [119]. The data are collected mainly from hospitals and primary care, even if some of the registries concern stroke, diabetes and dementia. Thus, there are no available data from these registries about the quality of care for older people. Since 1992, the NBHW has annually evaluated the care of older people. In the report for 2006, the NBHW described that the healthcare staff has to take care of older persons with complicated and composite nursing needs and who have multiple illnesses [13]. Lack of quality was identified regarding drug management, lack of knowledge of medical-technical equipments, lack of assessment of patient needs and delay of treatments. These identified areas mainly concerned lack of education and skills among healthcare staff personnel. Furthermore, the NBHW concluded that the lack of joint quality indicators and a national data base or quality registry makes it very difficult to describe the quality of care in the care of older people [13]. Recently, the Swedish Association of Local Authorities and Regions (SALAR) published the first report on "open comparisons of service quality and effectiveness" in the care of older people [120]. Indicators on fall injuries in persons over 80 years, unplanned admittance to hospitals and medicine management were included in the audit. Not unexpected, huge differences among the municipalities were revealed on all indicators. For example, the incidence of fall injuries varied between 47 and 223 per 1000 inhabitants over the age of 80 years. Furthermore, in the care of persons diagnosed with dementia great differences were observed when geriatric care in the county councils was compared with older people care in the municipalities, indicating a huge need for improvement in the municipalities [2, 121].

To support municipalities' long-term quality and skills development work in medical and social services for the care of older people the Swedish government launched a multi-year national initiative in 2005. The central government allocated more than 1 billion SEK for developing training for nursing staff, leadership development, training for supervisors, methods in nursing and social services, etc. [100]. Since 1998, the central government has allocated resources to R&D centers in the care of older people in collaboration with municipalities, county councils and universities [122]. In 2006, resources were allocated to 27 regional R&D centers, most of which were established in 2001 [13]. An evaluation of 10 R&D centers showed that 130 publications/reports were published each year, although not in peer-reviewed journals [122]. The managers at these R&D centers expressed challenges in the clash between expectations and culture from involved partners (i.e. the municipalities, county councils and universities). Representatives from universities often focus on systematic evaluations and research, whereas representatives from municipalities concentrate on direct benefits for the units. Professionals in healthcare are, according to laws and regulations, obliged to provide care in agreement to science and proven experience [7]. Social workers working in municipalities have not had these demands on their practice, which could

explain the lack of tradition of R&D in the municipalities. However, this attitude is slowly changing because evidence-based or knowledge-based practice in social work is currently being promoted [122].

2.3 THE RATIONALE FOR THE STUDY

The research in geriatric and nursing has increased in recent years, with the implication that the scientific base on which to provide evidence-based practice in the care of older people does exist and is growing. To support healthcare based on evidence SBU and NBHW publish systematic reviews and national guidelines on various topics. Although there is increasing knowledge about best practice in the care of older people, evaluations to date show that many patients do not receive adequate care.

Until now, studies on research utilization and barriers to research utilization in nursing have mainly been performed with RNs in hospitals. Thus, there is an increasing knowledge about the association of various factors with research use. However, there are huge contextual differences between hospitals and older people care facilities, such as work organization, access to resources for research and development, skill-mix of healthcare staff and access to in-services training. These differences raise important questions as to whether there also are differences in research use compared with a healthcare staff working in a hospital setting.

Several barriers to research utilization have been identified. The strategy of identifying barriers might be useful for developing adequate interventions to enhance research use among healthcare staff in the care of older people. However, studies on barriers to research utilization have not been conducted in this setting. On a methodological base, there is a need to investigate if the barriers identified by the BARRIERS Scale are valid in relation to research use, i.e. does more use of research imply fewer perceived barriers and visa versa?

To conclude, in the care of older people the potential to provide high quality care by using research findings has greatly increased. To improve the outcomes for older persons it is also important to enhance the understanding of research utilization and elements involved in that process.

3 AIM

The overall aim of this thesis is to generate knowledge of research utilization of healthcare personnel (especially RNs) in the care of older people. The specific objectives are:

- To describe the perception of healthcare personnel with respect to research utilization and to compare research use between professional groups working in the care of older people (Paper I)
- To identify determinants of research utilization in the care of older people (Paper II)
- To describe RNs' reported research use in the care of older people and to examine the association between research use and factors related to the communication channels, the adopter and the social system (Paper III)
- To describe RNs' perceptions of barriers to and facilitators of research utilization and to examine the validity of the BARRIERS Scale in relation to research use, i.e. the capacity of the BARRIERS Scale to discriminate the perceptions of barriers between research users and non-research users. (Paper IV)

4 METHODS AND MATERIAL

4.1 DESIGN

The thesis is based on two surveys. A cross-sectional design was used in the two studies. Papers I and II originate from the first study and Papers III-IV from the second study.

4.2 SETTINGS AND SAMPLES

The two studies were conducted in municipalities in the southern part of the Stockholm region, which consists of 10 municipalities, representing about 500000 inhabitants. The first study was carried out in one of the municipalities during the autumn of 2000. The second study was performed in eight of the municipalities during the end of 2001 and beginning of 2002.

4.2.1 Study I

In the first study (Papers I-II) one large municipality with several units was selected. To obtain a representative sample of different specialties of special housings two units per specialty were selected. In this municipality 11 units caring for older people were available within the following specialties: (a) rehabilitation (one unit), (b) nursing homes for people with both medical and nursing needs (two units), (c) group dwellings for people with dementia (four units) and (d) group dwellings for people with nursing needs (four units). Totally, 550 residents were living in these units and 370 healthcare personnel were employed. Of the 11 units, 7 were included in the study representing these four areas. The single rehabilitation unit and the two nursing homes were included directly, while two group dwellings per area (c and d) were randomly selected. Within these seven units, 132 individuals were employed. The response rate was 67% (n=89/132). Sample demographics are presented in Table 2.

Table 2. Sample demographics (n=89) (Papers I-II).

	Total		EN/NA ^a	RN ^b	RP ^c
	n	%	n	n	n
Sex:					
female	86	97	63	10	13
male	3	3	0	1	2
Age (mean, range):	44.1 (19-64)		43.3 (19-64)	49.4 (40-59)	43.6 (25-64)
Years of employment in the community (mean, range):	6.2 (0-34)		6.7 (0-34)	4.1 (0-12)	5.7 (0-20)
Part-time/Full-time:					
part-time	50	56	39	9	2
full-time	39	44	24	2	13
Highest level of education:					
- compulsory	26	29	26	0	0
- secondary upper school	35	39	35	0	0
- university	28	32	2	11	15

^a Enrolled nurses and nurse aides

^b Registered nurses

^c Rehabilitation professionals (mainly occupational therapists and physiotherapists)

4.2.2 Study II

In this study (Papers III-IV) the CCN in each of the 10 municipalities was asked if the RNs working in their municipality could participate. Two of the 10 CCNs declined to participate because of other ongoing surveys among healthcare staff members. Thus, from the eight municipalities where the CCNs expressed interest to be involved, all RNs (n=210) working in the care of older people were invited to participate. The response rate was 67% (n=140/210). Sample demographics are presented in table 3.

Table 3. Sample demographics (n=140) (Papers III-IV).

	TOTAL	
	n	%
Sex:		
female	132	96
- male	8	4
Age: (mean, range)	45 (23-62)	
Nursing program:		
- graduation before 1982	53	38
- graduation after 1982	61	44
- foreign education	25	18
Specialist nursing program:		
- yes	55	40
- no	84	60
Working experience as RN: (mean, range)	16 (0.5-40)	
Work hours:		
- part-time	56	40
- full-time	84	60
Work place/Care setting:		
nursing home	73	52
rehabilitation and group dwellings	67	48
Responsible for practice development at work place:		
- yes	50	39
- no	79	61

4.3 INSTRUMENTS

Five questionnaires were used to measure research utilization, barriers to and facilitators of research utilization and factors related to research utilization.

4.3.1 Background questionnaire (Papers I-IV)

Background questionnaires were specifically developed for the two studies. These questionnaires contained questions on demographic data (e.g., age, gender, profession, education, years of employment, working full-time or part-time) and work place (e.g., nursing homes, rehabilitation units, dementia group dwellings).

4.3.2 The Research Utilization Questionnaire (RUQ) (Papers I-IV)

The RUQ was developed by Champion & Leach [45] and further revised by Pettengill et al. [123] and Humphris et al. [47]. The respondents were asked to do the following:

- Indicate their participation in a range of research-related activities (14 *yes/no* items).
- Respond to items forming separate indexes within the following three domains: (a) *Attitudes towards research* (12 items), (b) *Availability and support to implement research results* (8 items) and (c) *Research utilization in daily practice* (9 items) (the RU index). All items employ a 5-point scale ranging from 1=*strongly disagree* to

5=*strongly agree*. After reversing the values of the negative statements, the indexes were calculated by adding each respondent's scores for each domain and then dividing by the number of items within the respective domain.

- Indicate the research-related resources available to them (11 *yes/do not know/no* items).
- Complete a scale from 1 to 10 on how active they are in seeking out research (1=*wait to be told about new research* to 10=*actively seek new research*).
- Rank 10 factors that might "discourage" their use of research findings in practice and 10 that might be "helpful".

The RUQ has been translated into Swedish and slightly revised and then back-translated to English [52]. In that study Cronbach's alphas for the three indexes (*Attitudes towards research*, *Availability and support for the implementation of research findings* and *Research utilization in daily practice*) were 0.88, 0.75 and 0.84, respectively [52].

In Papers I-II Cronbach's alpha coefficients were 0.89 (*Attitudes towards research*), 0.51 (*Availability and support for the implementation of research findings*) and 0.88 (*Research utilization in daily practice*). In Papers III-IV Cronbach's alpha coefficients were 0.88, 0.57 and 0.84 in mentioned order. Because of the low value for *Availability and support for the implementation of research findings*, this index was not used. Instead, the eight items within this domain were used as single items.

4.3.3 The Creative Climate Questionnaire (CCQ) (Paper II)

The CCQ was developed by Ekvall [124]. This instrument consists of 50 items designed to assess the following 10 dimensions of organizational climate:

- *Challenge*: Emotional involvement of members of an organization in its operations and goals.
- *Freedom*: Independence in behavior exerted by people in the organization.
- *Idea Support*: The ways new ideas are treated.
- *Trust*: Emotional safety in relationships.
- *Dynamism*: Eventfulness of life in the organization.
- *Playfulness*: Display of spontaneity and ease.
- *Debates*: Occurrence of encounters and clashes between viewpoints, ideas and differing experiences and knowledge.
- *Conflicts* (inverse to other dimensions, low scores are desirable): Presence of personal and emotional tensions (in contrast to conflicts between ideas) in the organization.
- *Risk-Taking*: Tolerance of uncertainty in the organization.
- *Idea Time*: Time people can use (and use) for elaborating new ideas.

Each dimension includes five statements that are rated on a 4-point scale ranging from 0=*absolutely inapplicable* to 3=*highly applicable*. To calculate the dimensions of organizational climate the scores of the five statements within each of the 10 dimensions were added and divided by the number of included statements. The dimension mean values range from 0.0 expressing an extremely stagnated and passive organization to 3.0 expressing a highly creative and dynamic organization.

In previous studies Cronbach's alpha coefficients ranged between 0.73 and 0.89 for the 10 dimensions [124]. In Paper II the values ranged between 0.77 and 0.91.

4.3.4 Questionnaire on organizational data at the municipality level (Paper III)

To collect data on organizational issues at the municipality level a questionnaire was

sent to the CCN at each municipality. The questionnaire consisted of items about the work organization of RNs (i.e. consultant or team role). There were also questions on access to research and development (R&D) resources in the municipality (e.g., access to a library, access to a computer with Internet and access to a (R&D) unit or corresponding resources (e.g., practice developer or clinical lecturer)).

4.3.5 The BARRIERS Scale (Paper IV)

Funk and colleagues developed the BARRIERS Scale from three separate sources: literature about research utilization, the Conduct and Utilization of Research in Nursing (CURN) project questionnaire and informal data gathered from nurses [68]. The scale is composed of 29 items. The respondents were asked to rate the items on a 4-point scale (1=*to no extent*, 2=*to a little extent*, 3=*to a moderate extent* and 4=*to a great extent*). In addition, a *no opinion* alternative was offered. Factor analysis was performed that resulted in a four-factor solution (subscales) and these were assumed to be congruent with factors in Rogers' Diffusion of innovations theory [34]. The subscales, labeled in accordance with Rogers' theory, are:

- The characteristics of the adopter - the nurse's research values, skills and awareness – the *Nurse* subscale (8 items).
- The characteristics of the organization – setting barriers and limitations – the *Setting* subscale (8 items)
- The characteristics of the innovation – qualities of the research – the *Research* subscale (6 items)
- The characteristics of the communication – presentation and accessibility of the research – the *Presentation* subscale (6 items).

The outcome of each subscale was calculated by adding each respondent's score and then dividing by the number of items in the subscale: the *no opinion* responses were not used in calculating the outcome. In addition, in an open-ended question the respondents were asked to make suggestions on how to facilitate research utilization.

The BARRIERS Scale has been translated into Swedish and then back-translated into English to confirm concordance [95]. An additional item was included covering the English language as a barrier for Swedish nurses. (This language item is not included in the subscales.) Nilsson Kajermo and colleagues used the BARRIERS Scale in a sample of Swedish RNs working in hospitals and Cronbach's alpha was used to test the reliability of the scale [95]. The alpha values were 0.81 (the *Nurse*), 0.87 (the *Setting*), 0.86 (the *Research*) and 0.83 (the *Presentation*). In Paper IV the alpha values were 0.75, 0.70, 0.78 and 0.67 in mentioned order.

4.4 PROCEDURES

In Study I, the unit managers at the seven units provided the research team with a list of all healthcare staff. In Study II, the CCNs in each of the eight included municipalities provided the team with a list of all RNs working in the care of older people. In both studies the questionnaires were numbered for identifying respondents. The questionnaires were sent to all participants at their workplace with a cover letter outlining the purpose of the study. The letter included an assurance of confidentiality and voluntary participation. Reminders with new questionnaires were sent twice (after three and six weeks) to those who did not respond.

4.5 DATA ANALYSES

The data were analyzed using SPSS version 14.0 (Papers I-II) and version 15.0 (Papers III-IV).

4.5.1 Statistics

An overview of the statistical tests that were used in the four papers is presented in Table 4. The summated scales (the indexes from the RUQ, the dimensions from the CCQ and the subscales from the BARRIERS Scale) have been treated as interval data [19]. If missing data were <50% of all items within each summated scale when calculating each respondent's summated scales, the missing data were substituted with the mean value of the reported ratings within this summated scale [19].

Table 4. Statistical tests used in the four papers.

Purpose/ Analysis	Statistical test	Paper
Describe frequencies and distributions	Frequency, mean, standard deviation, range	I, II, III, IV
Assess the internal consistency of summated scales	Cronbach's alpha test	I, II, III, IV
Assess the difference between two independent group means (interval, ratio data)	Student's <i>t</i> -test	I, II, III, IV
Assess the difference in proportions in two and more than two independent groups (nominal data)	Chi-square test and Fisher's exact test	I, II, III, IV
Examine the magnitude of a relationship between two dichotomous variables	Phi coefficient	I
Examine the magnitude of a relationship between variables in a contingency table	Cramér's V	I
Examine the relationship between two variables (interval/ratio data)	Pearson's product-moment correlation	IV
Determine whether a correlation is different from zero (that a relationship exists) (ordinal data)	Spearman's rank order correlation	II, III
Examine the associations between one independent variable and one dependent variable in order to predict the probability of an event	Logistic regression	III
Examine the associations between 2 or more independent variables and 1 dependent variable in order to predict the probability of an event	Logistic regression	II, III

Comparisons regarding the use of research findings by professional groups were made in Paper I by dividing the sample of four professional groups (NAs, ENs, RNs and RPs) into two groups, i.e. the RNs and the RPs were merged into one group and the ENs and the NAs into another group. In Paper III, the relationships between RNs research use and RNs' role (team role vs. consultant) and RNs' access to R&D resources at the municipal level were examined.

4.5.1.1 Multiple-logistic regression models

Multiple-logistic regression models were set up to examine multivariate associations between the dependent variable "Research use" and the independent variables (Table 5). Two conceptual frameworks (the PARIHS framework by Rycroft-Malone et al. [32] in Paper II and Rogers' Diffusion of Innovation theory [34] in Paper III) were used for organizing the independent variables.

4.5.1.1.1 Paper II

Dependent variable

The sample was divided into two groups based on the respondents' response to the following single item from the RUQ: *I use research findings in my daily practice*. This item was selected because it measures a general use of research findings. The respondents who answered *Strongly agree* and *Agree* constituted the research users group. The respondents reporting *Do not know*, *Disagree* and *Strongly disagree* were classified as non-research users.

Independent variables

The independent variables were organized as individual factors according to Estabrooks et al. [71] and organizational factors according to the PARIHS framework [32]. Table 5 lists the dependent and independent variables as well as the response options.

Student's *t*-tests, Chi-Square tests and Fisher's exact tests were used to analyze group differences between the research users and the non-research users groups. Two multiple-logistic regression models were developed, one with the individual factors and one with the organizational factors.

4.5.1.1.2 Paper III

Dependent variable

The respondents (RNs) were divided into two groups, namely the research users group and the non-research users group. In this paper the respondents' rating on the RU-index was employed to evaluate their use of research findings. An arbitrary cut-off value was set at 3.6, which represents 'research use behavior' more on the 'user-side' than on the 'do not know' or the 'non-user-side' of the scale. The index consists of nine items and when a respondent rates, for example, *agree* (=4) on five of the nine items and *do not know* (=3) on four of the items, the mean value on the RU-index will be 3.6. The data from six respondents could not be used because missing data for >50% of the items within the RU-index.

Independent variables

The independent variables were organized according to three of the four main elements of Rogers' theory Diffusion of innovation [34]; namely, the communication channels, the adopter and the social system (Table 6).

Logistic regression (enter model) was used to examine bivariate associations between the characteristics of the independent variables (the communication channels, the adopter and the social system) and the dependent variable (research use) in Paper III. The results are presented as odds ratio (OR) with 95% confidence intervals (CI). Multiple-logistic regression analysis was calculated to examine the associations between the significant independent variables within each element and research use. A final multiple-logistic regression model was developed with the significant variables from the three elements.

To examine multicollinearity in Papers II-III the significant factors in the bivariate analysis were analyzed with Spearman's rank order correlation. A *rho* value >0.85 indicated that one of the co-varying variables should be excluded [125]. In Paper II a *p*-value <0.01 was considered to indicate statistical significance in the bivariate analysis because of repeated testing. In the multiple-logistic regression analyses the level of statistical significance used was <0.05.

Table 5. Dependent and independent variables and response options (Paper II).

	<i>ITEMS MEASURED</i>	<i>RESPONSE OPTIONS</i>
Dependent variable	I use research findings in my daily practice	5-point scale ranging from 1 to 5 ¹
Independent variables		
<i>Individual factors</i>		
Beliefs and attitudes toward research	Attitudes to research index (12 items)	5-point scale ranging from 1 to 5
Involvement in research activities	Participation in quality improvement activities	Yes/no
	Assisting with research undertaken by my professional group	Yes/no
Information seeking	Analyzing research data	Yes/no
	Discussing research findings with professional colleagues in their own unit	Yes/no
	Discussing research findings with professional colleagues in other units	Yes/no
	Reading about research projects in professional journals	Yes/no
Education	Seeking research related to clinical practice	5-point scale ranging from 1 to 5
	Highest educational level	Compulsory, secondary upper school, university
Professional characteristics	Profession	Nurse aide, enrolled nurse, registered nurse, physiotherapist, occupational therapist, others
Other socio-economic factors	Work hours	Full-time, part-time
	Years of employment	Open response option
	Gender	Female, male
	Age	Open response option
<i>Organizational factors</i>		
Context	Having access to research findings at the work place	5-point scale ranging from 1 to 5
	Access to Internet	Yes/no/do not know
	Having time to read about research while on duty	5-point scale ranging from 1 to 5
Culture	The clinical team I work with supports research utilization	5-point scale ranging from 1 to 5
	Challenge	4-point scale ranging from 0 to 3 ²
	Freedom	4-point scale ranging from 0 to 3 ²
	Idea support	4-point scale ranging from 0 to 3 ²
	Trust	4-point scale ranging from 0 to 3 ²
	Dynamism	4-point scale ranging from 0 to 3 ²
	Playfulness	4-point scale ranging from 0 to 3 ²
	Debates	4-point scale ranging from 0 to 3 ²
	Conflicts (counter-indicative)	4-point scale ranging from 0 to 3 ²
	Risk-taking	4-point scale ranging from 0 to 3 ²
	Idea time	4-point scale ranging from 0 to 3 ²
	Leadership	The unit manager supports the utilization of research

¹ 1=strongly disagree, 2=disagree, 3=do not know, 4=agree, 5=strongly agree

² 0=absolutely inapplicable, 1=applicable to some extent, 2=fairly applicable, 3=highly applicable

Table 6. Dependent and independent variables and response options (Paper III).

ITEMS	RESPONSE OPTIONS
Dependent variable	
Research utilization in daily practice index (9 items)	5-p scale ranging from 1 to 5 ¹
Independent variables	
<i>Characteristics of the communication channels</i>	
Access to research findings at work place	5-p scale ranging from 1 to 5
Access to Internet	Yes vs. no/do not know
Access to library	Yes vs. no/do not know
Access to librarian	Yes vs. no/do not know
Access to R&D resources at municipality	Yes vs. no
Access to researcher	Yes vs. no/do not know
Discussing research findings with professional colleagues in own unit	Yes vs. no
Discussing research findings with professional colleagues in other units	Yes vs. no
Reading research projects in professional journals	Yes vs. no
Participating in quality improvement activities	Yes vs. no
<i>Characteristics of the adopter</i>	
Gender	Female, male
Age	Open response option (years)
Nursing program at university level	Yes (degree after 1982) No (degree before 1982)
Specialist nursing program	Yes vs. no
Years of working experiences as RN	Open response option
Work hours	Full-time, part-time
Responsibility for practice development	Yes vs. no
Attitudes to research index (12 items)	5-p scale ranging from 1 to 5
Actively seeking research	10-p scale ranging from 1 to 10 ²
<i>Characteristics of the social system</i>	
The clinical team I work with support research utilization	5-p scale ranging from 1 to 5
The unit manager supports the utilization of research	5-p scale ranging from 1 to 5
Having time to read about research on duty	5-p scale ranging from 1 to 5
Education in research is arranged in my municipality	5-p scale ranging from 1 to 5
RNs role	Consultant role vs. team member
Care setting	Nursing home (general) vs. dementia group settings, rehabilitation units (specialists)

¹ 1=strongly disagree, 2=disagree, 3=do not know, 4=agree, 5=strongly agree

² 1 = actively seek new research, 10 = wait to be told about new research

4.5.1.2 Validation of the BARRIERS Scale (Paper IV)

To describe the RNs perceptions of barriers the 4-point scale was dichotomized by merging the respondents who answered the two response alternatives 3 and 4 into one category representing respondents reporting more barriers to research utilization. The respondents who scored response alternatives 1 and 2 were merged into another category expressing fewer perceived barriers. Pearson's product-moment correlation coefficient was used to examine relationships between the RU-index and the four subscales. To examine the capacity of the BARRIERS Scale to discriminate perceptions of barriers between research users and non-research users, Student's *t*-test was applied in assessing differences between the mean ratings of the two groups on the four subscales. The respondents (RNs) were divided into two research users groups using the same principle used in Paper III (i.e. the respondents' rating on the RU-index). A Chi-square test was performed to assess the difference in proportions between the groups on specific items.

4.5.2 Open-ended questions

The BARRIERS Scale included one open-ended question asking the respondents to suggest facilitators to research utilization. In Paper IV the characteristics of the four

subscales (i.e. the *Nurse*, the *Setting*, the *Research* and the *Presentation*) were used to categorize and summarize the respondents' answers.

4.6 ETHICAL CONSIDERATIONS

All studies in this thesis were performed in accordance with the World Association Declaration of Helsinki [126]. The two studies were approved by the Research Ethical Committee at Huddinge University Hospital (289/2000) and by a supplementary regulation dated 2001-06-11.

The respondents were asked about their perceptions of research, research use, work situation and educational background. Hypothetically, some of the questions might be perceived as a violation of the respondents' integrity and the number of questionnaires (three-four) could be perceived as overly extensive and time consuming. However, in the cover letter the respondents were informed that their participation is voluntary and the management of the questionnaires will be confidential. Furthermore, the respondents were assured that in the compilation of data no individual could be identified. The cover letter included names and phone numbers of the responsible researchers. The questionnaires were numbered for the purpose of sending out reminders. The respondents' consent to participate was assumed if they returned the questionnaires.

5 RESULTS

The main findings in Papers I-IV are summarized and presented in the following order: (1) research utilization in the care of older people, (2) determinants of research use, (3) barriers to and facilitators of research utilization and (4) research use and differences in perceptions of barriers.

5.1 RESEARCH UTILIZATION IN THE CARE OF OLDER PEOPLE

In total, the healthcare staff (i.e. NAs, ENs, RNs and RPs) (Paper I) and the RNs (Paper III) reported a relatively low level of use of research findings in daily practice (Table 7). Both samples scored a mean value of <3 on the RU-index. Nearly half of all the RNs in Paper III reported that they used research findings in daily practice, whereas slightly one third of the sample in Paper I reported using research findings (Table 7). About one fifth of the respondents in both samples reported that they implemented specific research findings in their daily practice.

The comparisons between the professional groups showed that the RNs and RPs used research in daily practice more frequently as compared with the ENs and NAs (Table 7). The RNs with access to R&D resources at the municipal level reported more use of research findings (both with regards to the RU-index and specific research findings) than the RNs working without access to such resources (Table 7).

5.1.1 Participating in research-related activities

Participation in quality improvement was the most frequently (39%) reported activity by the healthcare staff (Paper I). Thirty-six percent of the healthcare staff (Paper I) reported that they read research reports in professional journals. However, there was a large difference between the two groups: 65% of the RNs and RPs reported that they read research reports in professional journals, whereas only 22% of the ENs and NAs reported this activity (Table 7). In Paper III the most frequently reported activity by the RNs was reading research reports (Table 7). In addition, 47% of the RNs reported participation in quality improvement activities (Paper III).

5.1.2 Access to research-related resources and support to implement research results

In Paper I nearly half (47%) of the healthcare staff had access to Internet and 28% reported access to a library with current journals and books (Table 7). A difference was found between the RNs and RPs (85%) and the ENs and NAs (32%) on access to the Internet. A majority (82%) of the RNs in Paper III reported access to Internet and 37% reported access to library services. One fifth (21%) of the RNs reported access to a librarian and 5% had access to a skilled researcher.

Totally, less than half of the respondents in both samples reported access to research findings at their workplace and support from their unit manager and colleagues to implement research findings (Table 7). The RNs and RPs reported better access to research findings and they perceived greater support from their unit manager to implement research findings than the ENs and NAs. The RNs with access to R&D resources reported better access to research findings and they experienced more support from their unit manager. The majority of the respondents in both studies (52% of the healthcare staff in Paper I and 65% of the RNs in Paper III) reported that they did not have time to read research reports while on duty.

Table 7. Healthcare staff and RNs' use of research findings (Papers I and III).

Sample	Paper I			Paper III				
	Total N=89	Ens and NAs N=63	RNs and RPs N=26	Total N=140	Team role N=99	Consultant role N=41	Access to R&D resources N=65	No access to R&D resources N=75
Research use index ¹	2.73	2.56	3.12**	2.95	2.95	2.95	3.10*	2.81
Attitude to research index ¹	3.67	3.45	4.21**	3.86	3.85	3.88	3.90	3.82
I use research findings ²	28%	17%	54%**	45%	50%	43%	49%	41%
Implement specific findings ³	21%	7%	54%**	21%	27%*	8%	32%**	13%
Read journal articles ³	36%	22%	65%**	74%	76%	73%	73%	74%
Support from unit manager ²	28%	10%	73%**	34%	41%	29%	48%**	22%
Support from colleagues ²	38%	22%	77%**	38%	41%	29%	44%	32%
Access to library ³	28%	22%	42%	37%	40%	28%	40%	34%
Access to Internet ³	47%	32%	85%**	82%	87%*	69%	84%	80%
Access to research findings at workplace ²	26%	22%	77%**	33%	42%	30%	46%**	22%

EN= enrolled nurse, NA= nurse aide, RN= registered nurse, RP= rehabilitation professional (physiotherapist, occupational therapist, etc.)

¹ 5-point scale 1= strongly agree 2= agree 3= do not know 4=disagree 5=strongly disagree

² Percentage scored agree and strongly agree

³ Percentage reported yes

* $P < 0.05$ ** $P < 0.01$

5.1.3 Attitudes to research

Overall, the respondents reported positive attitudes to research (Table 7). Half (53%) of the healthcare staff reported that understanding research helped them professionally (Paper I). The RNs and RPs reported significantly more positive attitudes to research and nearly all (92%) of them reported that understanding research helped them professionally; on the other hand, only one third (37%) of the ENs and NAs reported that understanding research helped them in their work (Paper I). Eighty-one percent of the RNs agreed to the statement that understanding research helped them in their professional activities (Paper III).

5.1.4 Do not know - respondents

Some of the respondents, and especially the ENs and NAs in Paper I, answered *Do not know* to the items in the RUQ. Nearly half of the ENs and NAs stated *Do not know* to the items about research use, which can be compared with 8-31% of the RNs and RPs (Paper I). More than 60% of the respondents reported *Do not know* on access to research-related resources. Two thirds of the healthcare staff did not know if their unit managers were supportive. This was especially prominent among the ENs and NAs of whom 86% answered *do not know* on the statements about unit manager's supportiveness (Paper I). Of the 140 RNs, 88 (63%) did not know if their unit managers supported the implementation of research findings (Paper III).

5.2 DETERMINANTS OF RESEARCH USE

Associations between research use and independent variables were examined in Papers II-III. In Paper II the independent variables were categorized into individual factors and organizational factors according to the PARIHS framework (Table 5, page 20). In Paper III the three elements – the communication channels, the adopter and the social system – from the theory Diffusion of Innovations was used to classify the independent variables (Table 6, page 21).

5.2.1 Associations between research use and independent variables

In Paper II 25 (28%) of the respondents agreed to the item *I use research findings in daily practice*. These respondents were then categorized as research users. In the bivariate analyses the following 6 of 14 individual factors were significantly associated with research use: *Positive attitudes to research*, *Analyzing research data*, *Reading research reports*, *Seeking research related to clinical practice*, *University education* and *Professional groups* (i.e. RNs and RPs vs. ENs and NAs). Of the 15 organizational factors, the following 6 were associated with research use: *Access to research findings*, *Support from colleagues*, *Support from the unit manager* and the three dimensions of organizational climate (*Challenge*, *Trust* and *Risk-Taking*).

In Paper III 29 (22%) of the RNs gave a rating of ≥ 3.6 on the RU-index and were thus classified as research users. The bivariate analyses revealed that research use had significant associations with four factors related to the communication channels: *Access to research findings at the workplace* (OR=5.77), *Reading research reports* (OR=3.69), *Discussing research with colleagues in your own unit* (OR=3.07) and *Access to a librarian* (OR=2.85). Furthermore, significant associations were found between research use and four factors related to the adopter: *Positive attitudes to research* (OR=18.50), *Actively seeking research* (OR=3.97), *Nursing program at university level* (OR=3.74) and *Years of working experience as a RN* (OR=0.94). One factor related to the social system had a significant association with research use, namely *Care setting* (OR=2.85), indicating higher research use among RNs working in dementia group dwellings and rehabilitation units than RNs working in general nursing homes.

5.2.2 Determinants of research use in healthcare staff (Paper II)

Associations between research utilization and individual and organizational factors were analyzed separately using multiple-logistic regression models. Two determinants were identified in the individual model: *Attitudes toward research* and *Seeking research related to clinical practice* (Table 8). In the regression model for the organizational factors *Access to research findings at the workplace* and *Support from the unit manager* were identified as significant determinants.

Table 8. Factors in the final models of research use among healthcare staff and RNs.

Factors	Healthcare staff (Paper II)	RNs (Paper III)
Access to a librarian	Not investigated	ns
Access to research findings at the workplace	OR=6.65	OR=12.08
Care setting	Not investigated	ns
Challenge	ns	Not investigated
Discussing research with colleagues	ns	ns
Educational level (university – non-university)	ns	Not relevant
Nursing program at university level	Not investigated	OR=5.70
Positive attitudes to research	OR=5.52	OR=13.96
Reading research reports	ns	ns
Risk-Taking	ns	Not investigated
Seeking research related to clinical practice	OR=5.56	ns
Support from colleagues	ns	ns
Support from the unit manager	OR=4.03	ns
Trust	ns	Not investigated

ns =not significant

5.2.3 Determinants of research use in RNs (Paper III)

Associations between research use and the factors related to the communication channels and the adopter were analyzed separately using multiple-logistic regression models. Within the communication channels, the results showed an OR of 4.88 for research use when *Access to research findings at the workplace* improved and an OR of 3.03 when nurses had *Access to a librarian*. Concerning the adopter, the results revealed an OR of 10.52 when *Attitudes to research* improved and an OR of 3.28 when nurses had a *university education*.

A final multiple-logistic regression model, which included all five significant variables from the regression models on each element, revealed that *Access to research findings*, *Attitudes to research* and *Nursing program at university level* were significantly associated with research use (Table 8).

5.3 BARRIERS TO AND FACILITATORS OF RESEARCH UTILIZATION

Among the RNs, the five highest rated barriers were; *The nurse is isolated from knowledgeable colleagues with whom to discuss the research*; *the facilities are inadequate for implementation*; *the relevant literature is not compiled in one place*; *research reports/articles are not readily available*; and *the nurse does not have time to read research* (Table 9).

The most prominent barriers were found in the subscales *Setting* and *Presentation* (Table 10). Analysis of the relationship between the outcomes of the four subscales and the background variables revealed that the RNs having an older nursing program (and older by age and with longer working experience) rated more barriers on the *Presentation* and *Nurse* subscales than the RNs having a recent nursing program. RNs working in specialist units (rehabilitation and group dwellings for persons suffering from dementia) rated a fewer number of barriers on the *Presentation* subscale as compared with RNs working in nursing homes.

Table 9. RNs reported barriers to research utilization (i.e. RNs who scored 3 or 4 on the BARRIERS Scale).

Rank order	Subscale	Item	%
1	Nurse	The nurse is isolated from knowledgeable colleagues with whom to discuss the research (n=123)	89
2	Setting	The facilities are inadequate for implementation (n=124)	88
3	Presentation	The relevant literature is not compiled in one place (n=112)	81
4	Presentation	Research reports/articles are not readily available (n=133)	80
5	Setting	The nurse does not have time to read research (n=131)	79
6	Setting	There is insufficient time on the job to implement new ideas (n=127)	70
7	Presentation	Implications for practice are not made clear (n=121)	67
8		Research reports/articles are written in English (n=130)	64
9	Setting	Other staff are not supportive of implementation (n=81)	63
10	Research	The research has not been replicated (n=56)	57
11	Presentation	The statistical analyses are not understandable (n=125)	55
12	Research	Research reports/articles are not published fast enough (n=50)	52
13	Setting	The nurse does not feel she/he has enough authority to change patient care procedures (n=124)	50
14	Setting	Physicians will not cooperate with implementation (n=61)	46
15	Presentation	The research is not reported clearly and readably (n=90)	43
16	Setting	The nurse feels results are not generalizable to own setting (n=113)	41
17	Nurse	There is not a documented need to change practice (n=96)	41
18		The amount of research information is overwhelming (n=93)	40
19	Nurse	The nurse does not feel capable of evaluating the research (n=114)	39
20	Research	The literature reports conflicting results (n=59)	37
21	Nurse	The nurse sees little benefit for self (n=120)	33
22	Nurse	The nurse does not see the value of research for practice (n=119)	30
23	Research	The nurse is uncertain whether to believe the results of the research (n=108)	30
24	Nurse	The nurse feels the benefits of changing practice will be minimal (n=91)	28
25	Nurse	The nurse is unaware of the research (n=132)	25
27	Setting	Administration will not allow implementation (n=70)	23
26	Research	The research has methodological inadequacies (n=56)	23
28	Nurse	The nurse is unwilling to change/try new ideas (n=135)	19
29	Presentation	The research is not relevant to the nurse's practice (n=131)	17
30	Research	The conclusions drawn from the research are not justified (n=81)	13

n= respondents scoring 1-4 on the 4-point scale.

On 6 of the 30 items more than half of the RNs did not have an opinion. This was particularly obvious for the subscale *Research*, of which more than half of the RNs answered *no opinion* on 4 of the 6 items.

Sixty (43%) of the 140 RNs reported one or more suggestions that could facilitate research utilization. The most frequently suggested facilitators concerned *Setting* (n=58) and *Presentation* (n=48). Regarding the *Setting*, respondents wanted support from unit managers, colleagues and facilitators, as well as additional time for reading, discussing and implementing research in practice. The respondents proposals regarding *Presentation* related to better accessibility of research findings: for example, research reports should be user-friendly, written in Swedish and located close to the person's workplace. Some RNs suggested enhanced collaboration and establishment of networks. A few suggestions concerned educational activities.

5.4 RESEARCH USE AND DIFFERENCES IN PERCEPTIONS OF BARRIERS

A significant negative correlation was found between the respondents scoring on the RU-index and the *Presentation* subscale, suggesting that the RNs who reported more use of research findings were less likely to perceive presentation of research as a barrier to research utilization (Table 10).

Table 10. RNs' reported barriers on the four subscales, comparisons between RU and non-RU and correlations between the subscales of the BARRIERS scale and reported research use.

	Total =140	RU n=29 ¹	Non- RU n=105 ¹	P-value	Correlations Research use index vs. the	P-value
Nurse subscale	2.19 ±0.56	1.97 ±0.53	2.25 ±0.54	0.013	-0.107	0.22
Setting subscale	2.71 ±0.52	2.65 ±0.45	2.71 ±0.52	0.571	-0.051	0.56
Research subscale	2.17 ±0.66	1.96 ±0.56	2.25 ±0.66	0.035	-0.171	0.06
Presentation subscale	2.62 ±0.58	2.36 ±0.41	2.69 ±0.61	0.001	-0.289	<0.01

¹ A loss of six respondents regarding the RU index reduced the final sample to 134 respondents.

To examine the validity of the BARRIERS Scale, specifically its relation to research use, the sample was divided into two groups (research users and non-research users) using the same principle as in Paper III. The analysis indicated that the research users rated significantly fewer barriers on the *Presentation*, *Nurse* and *Research* subscales than the non-research users (Table 10). The lack of difference between the research users and non-research users groups on the *Setting* subscale called for an analysis at the item level. This analysis revealed that the research users group scored significantly lower on the item *The nurse feels results are not generalizable to his/her own setting* (21 vs. 49%) (Table 11). No consistent trend was found regarding the two groups' ratings on the other items.

Table 11. Reported barriers (i.e. scoring 3 or 4 on the BARRIERS Scale) to research utilization between research users (RUs) and non-research users (non-RUs) for the Setting subscale..

Items	RU n=29 ¹	Non- RU n=105 ¹	P- value
The facilities are inadequate for implementation (n=124)	79%	90%	0.098
Other staff are not supportive of implementation (n=81)	74%	57%	0.163
The nurse does not have time to read research (n=131)	72%	82%	0.280
There is insufficient time on the job to implement new ideas (n=127)	72%	70%	0.770
Physicians will not cooperate with implementation (n=61)	56%	41%	0.282
The nurse does not feel she/he has enough authority to change patient care (n=124)	52%	48%	0.751
Administration will not allow implementation (n=70)	23%	22%	0.927
The nurse feels results are not generalizable to own setting (n=113)	21%	49%	0.012

¹ A loss of six respondents regarding the RU index reduced the final sample to 134 respondents.

5.5 SUMMARY OF RESULTS

Healthcare staff reported low levels of research use and the RNs reported a great extent of barriers to research utilization. There was a lack of information sources at the workplace and of supportive leadership. The RNs also reported a lack of knowledgeable colleagues in the municipality. Individual factors, such as positive attitudes to research, a nursing program at the university level, seeking research related to clinical practice and organizational factors (e.g., access to research findings at the workplace and supportive leadership) were identified as determinants of research use in the present older people care setting. The strongest determinants were positive attitudes to research and access to research findings at the workplace.

The RNs primarily reported barriers to research utilization that concerned the workplace organization and the presentation of research. The BARRIERS Scale appears to be useful for identifying some types of barrier to research utilization, except organizational barriers. Identified barriers were, however, general and wide-ranging making it difficult to design specific interventions.

6 METHODOLOGICAL CONSIDERATIONS

In this doctoral project the specific aims were to describe the respondents' use of research findings and perceptions of barriers to research utilization, as well as to examine associations between research use (dependent variable) and diverse factors (independent variables). Thus, a descriptive correlational design was used. The critical issues in using such a design are the instruments and the sample [127].

6.1 INSTRUMENTS

In the studies three instruments – the RUQ, the CCQ and the BARRIERS Scale - were used to measure research use, barriers to research utilization and factors related to research utilization. These instruments have been used in several international and Swedish studies and have been judged as valid and reliable tools. The RUQ has previously been used in two Swedish studies with a sample consisting of RNs mainly working in hospitals [52] and a sample consisting of dental hygienists [50]. The CCQ had been used among healthcare staff in the care of older people in Sweden [128-131]. The BARRIERS Scale has previously been used in Swedish studies among RNs working in hospitals [93, 95, 132-134]. The RUQ and the BARRIERS Scale have not been used in the care of older people and the RUQ has not been used among ENs and NAs.

The reliability of an instrument should always be evaluated for the current sample, especially if it is a new group of respondents for which the instrument has not been developed and used [19, 127]. The Cronbach's alpha test was used to assess the internal consistency of the summated scales for the three instruments. All summated scales had an acceptable Cronbach's alpha, except for the index *Availability and support to implement research results* in the RUQ used in Papers I-III. The alpha in this index was <0.60. Thus, this index was not used; instead, its eight items were employed as single items. The low Cronbach value indicated that the items within this index were not conceptually consistent and probably measured more than one phenomenon (construct) [125]. A further explanation might be that these items do not fit into the context of older people care. There were low Cronbach values in both sub-groups (ENs and NAs and RNs and RPs) in Paper I and in the sample of all RNs from eight municipalities in Paper III. Many respondents in the EN and NA groups answered *do not know* on the items, indicating a lack of awareness, knowledge or interest. A relationship between low educational level and *do not know* (or *no opinion*) responses has been identified in previous studies [57, 134, 135].

Some of the items in the *Research* subscale in the BARRIERS Scale were given a high proportion of no opinion responses by the RNs. This finding has been reported in many studies using the BARRIERS Scale [87, Paper V], indicating a lack of validity of this subscale and a lack of knowledge (or awareness and interest) with respect to research methodology among RNs. Furthermore, for the items in the subscale *Setting*, which has to do with support of and collaboration with physicians, other healthcare staff and administrators also gave a high proportion of no opinion responses. This finding of *no opinion* is in contrast to that found in other studies using the BARRIERS Scale. Explanations might be that in Sweden the physicians are not employed by the municipalities and some RNs might not consider them as team members. Moreover, the term "Administration" in Swedish refers to something impersonal and 'high up' in the bureaucracy, with whom the RNs might not have much dialogue. Furthermore, the Scale was developed in the late 1980s and it does not have any items on accessibility of new information technology and does not consider a patient's opinion as obstacles for implementing new practices. The validity of the BARRIERS Scale in relation to research use will be discussed in the discussion of results (page 38).

As described in the background section of this thesis, the concept research utilization has been further developed over the years. This concept could be interpreted as an overall use of research or it could be interpreted in terms of three types of utilization: direct, indirect and persuasive utilization. In the RUQ the respondents are not given any examples or definitions of research use. Further, some of the items concern the research process (such as data analysis) and not the research utilization process, which could be confusing. In the multiple-logistic regression models the objective was to identify determinants of general research use. To be sure of the respondent's opinion regarding the dependent variable (i.e. research use) the single item *I use research findings in my daily practice* (Paper II) was used. The respondents who answered *strongly agree* and *agree* were classified as research users and the respondents who answered *do not know* (or any of the disagree alternatives) were classified as non-research users. However, in Paper III the RU-index was used as the dependent variable in the multiple-logistic regression models. This change of dependent variable (from single item to summated scale) was made because of my increased awareness of that using a summated scale increases the reliability of measuring a concept, such as, general research use [136]. An arbitrary value (3.6) was selected for dichotomizing the outcome measure and dividing the sample into research users and non-research users (Papers III-IV). The proportions of research users in the two samples were 28% (Paper II) and 22% (Papers III-IV).

To conclude, the instruments used in the present studies have been used in many studies and have been judged as valid and reliable tools, even if they have, as discussed above, some shortcomings. The internal consistency was acceptable in 16 of 17 of the summated scales. The large number of *do not know* and *no opinion* responses suggest that, for many of the respondents, research utilization was a rather new phenomenon. There is a need of method development, primarily in clarifying and focusing on the concept of research use to gain increased clarity on what is actually measured. If a new measurement tool on research use is developed, as suggested by Estabrooks et al, such an instrument should preferably be valid and reliable for most settings in healthcare and for all groups of healthcare staff, not only for RNs [20].

6.2 CONCEPTUAL FRAMEWORKS

In correlational studies the aim is to examine associations between independent and dependent variables. The aim is not to prove causation [19, 127]. One threat to internal validity is using a "fishing expedition" strategy, i.e. not using a conceptual framework to guide the selection of independent variables, but rather evaluating all possible associations between the independent and dependent variables. The strength in the present study has been that two conceptual frameworks have guided the modeling of research use. However, a weakness was that the choice of frameworks was made during the phase of analyzing the data, not in the stage of designing the study. This lead, for example, to a lack of information collected on the "evaluation" sub-element of the PARIHS framework (Paper II). The Diffusion of innovations theory was used to frame the study in Paper III. This application also involved some considerations. Various information sources (e.g., access to a library and the Internet) were classified as belonging to the communication channels element. However, these variables might have been sorted under the social system instead.

The use of Rogers' theory has been useful to interpret the findings and, in doing so, detect the lack of "interpersonal channels" and lack of a supportive social system. Furthermore, such a use of theories also underlines the importance of using existing frameworks and theories for designing studies and explaining findings in order to attain a better understanding. In the field of research utilization there is a call for using a more theory-driven approach in research studies, especially in evaluating interventions and as a result explaining why these are working (or not) and under what circumstances [33, 82, 84, 137].

6.3 STATISTICS

In many correlational studies only bivariate analyses have been used in examining associations. However, these analyses should be used for identifying 'potential' determinants because these analyses do not account for latent intercorrelations among the independent variables. To identify 'actual' predictors multiple regression analyses are required [127, 136]. A rule of thumb suggests that 20 observations for each independent variable should be available or at least a minimum of five [127, 136]. In Paper II the sample size of 89 respondents fulfilled the 20-observation criterion for each independent variable in the regression model of individual factors. In the model of organizational factors in which there were six independent variables, we had nearly 15 respondents for each independent variable, which was judged to be acceptable. A larger sample size would have enhanced the power of the analysis and perhaps would have permitted detection of additional determinants. In Paper III, using a sample of 140 respondents, power requirements were better fulfilled. Furthermore, in Papers II-III multiple-logistic regression models were used where the dependent variable was dichotomized. The strength of dichotomizing the dependent variable is that the result is easier to interpret (for example, use of research findings or not). The limitation is a loss of information and loss of variance, which might have helped in finding additional and stronger associations between variables [138].

6.4 THE SAMPLE AND EXTERNAL VALIDITY

Convenience sampling of the municipalities was used in this study. The southern part of the Stockholm county council consists of 10 municipalities. The CCNs in these municipalities were invited to give consent to participation in the study and eight accepted. Then, all RNs working in the care of older people in these eight municipalities were sent information and questionnaires (Papers III-IV). One of these eight municipalities was chosen for the study of all healthcare staff in the care of older people (Papers I-II). In this latter study a sample was obtained representing the various professional groups working in older people care. Thus, the two samples represent a variety of small and big municipalities (Papers III-IV), and healthcare staff at various units in one of these municipalities (Papers I-II), all in the Stockholm region, which is a pronounced urban area. The findings might not be generalizable to rural municipalities because certain conditions (e.g., required training and turnover among healthcare staff) differ between older people care in urban and rural areas [139]. According to Brink and Wood, a random sampling is preferable in order to achieve a representative sample of the total population [127]. For financial and practical reasons, it was not feasible to make a random sampling of municipalities in this study. Thus, generalization of the findings has to be done with caution.

A response rate of 67% was achieved in all four papers, a rate that must be judged as adequate when using postal questionnaires [19]. However, the proportion of ENs and NAs in Papers I-II was 71% of the sample, which is less than the 'normal' proportion of ENs and NAs in the care of older people. Furthermore, the municipality in Paper I was one of the three municipalities with access to R&D resources at the municipal level. Further, I have been employed as a clinical lecturer in this municipality since October 1999. The data collection for Papers I-II was made nearly one year after I entered this position. Until this time, my work had mainly been focused on teaching and supervising nursing students. Because of these circumstances, the findings in Paper I might be more positive (i.e. more research use and more positive attitudes to research) than what would have been found in a population of healthcare staff in the care of older people in general.

7 DISCUSSION OF RESULTS

The overall aim of this study was to generate knowledge on healthcare staff's (especially RNs) research utilization in the care of older people. The findings showed that the use of research findings in practice was relatively infrequent, particularly for the EN and NA groups. These findings raise concern as to what extent it is possible to evidence-base care of older people. There is a national goal that the care of older people should be evidence-based but what kind of strategies should managers, policy makers and researchers develop and implement? In this discussion the following central issues are highlighted: to what extent do healthcare staff and RNs use research findings? What factors support or hinder research utilization? Is the BARRIERS Scale an appropriate instrument for identifying barriers to research utilization?

7.1 TO WHAT EXTENT DO HEALTHCARE STAFF USE RESEARCH FINDINGS?

The healthcare staff was found to use research findings infrequently. Comparing the results in Papers I and III with those in previous studies revealed that the healthcare staff in Paper I and the RNs in Paper III reported little use of research findings. This finding held regardless of whether the comparisons concerned the RU-index or implementation of specific research findings. The total sample of healthcare staff in Paper I and the RNs in Paper III had a lower mean value on the RU-index compared with respondents in other studies. Further, less than one fourth of the two total samples (Papers I and III) reported implementation of specific research findings. This finding can be compared with, for example, the finding of Humphris et al. [47] in which three fourths of British diabetes specialist nurses reported implementing research findings. Because of the little reported use of research of the healthcare staff and RNs, it could be questioned whether adequate research findings exist that could be applied to the care of older people? Further, does the healthcare staff in the present study value research as a source of knowledge in their daily practice? As described in the background to this study, research in geriatric and nursing has expanded exponentially, and the SBU and the NBHW have launched systematic reviews and national guidelines relevant for use in the care of older people [1-5]. However, evaluations have shown that there were problems regarding the dissemination of the guidelines. This was predominantly the case in primary care and in the care of older people, where the healthcare staff was unaware of the guidelines [8]. If this lack of awareness was related to poor information sources or lack of supportive leadership was unclear. The national guidelines are written for all professional groups in healthcare. Unfortunately, if and how ENs and NAs find these guidelines useful in their work have not been investigated.

In the present study less than half of the ENs and NAs were convinced that research supported them in their professional practice, indicating that many of these healthcare professionals do not believe that their practice has or should have a scientific base. Consequently, with such perceptions, there is no benefit in finding out about new research. According to Fahlström, ENs and NAs perceive themselves as professionals building more on tacit knowledge than science [109]. For them, nursing may be more about common sense and personal experience than caring based on research [109]. In daily practice nurses use various forms of knowledge. Carper suggested that nurses in clinical practice apply four patterns of knowledge: empirics (scientific findings), aesthetics (the art of nursing), ethics (moral pattern of knowing) and personal knowledge [140]. The authors of the PARIHS framework have argued that knowledge from diverse information sources, such as, scientific findings, clinical experience, patients' preferences and data from local data bases (e.g. data from quality improvement work), must be considered in the decision-making process [27]. First, it was probably not easy for many respondents to distinguish if their own knowledge was related to research findings or another 'information source'. Research results have often been transformed

into context-specific knowledge and thus many of the healthcare staff personnel do not know the primary source for the knowledge used [82]. Second, in daily practice, knowledge from these sources is mixed and there are many opinions on how to value these diverse sources [27, 141]. According to Bucknall, the ability to make good clinical judgment is the greatest attribute that clinicians can bring to patients [142]. However, the issue is to what extent a healthcare staff is aware of adequate research findings in practice.

Different professional groups' research use and implementation of specific research findings were investigated because no previous research had compared the extent of ENs and NAs use of research findings with that of RNs and RPs. In Swedish care of older people 80-90% of the healthcare staff personnel are ENs and NAs [13]. Thus, these professionals' perception of research utilization is of great importance for establishing EBP. Less than 10% of the ENs and NAs reported specific research utilization compared to half of the RNs and RPs. Only 22% of the ENs and NAs reported that they read research findings compared to 65% of the RNs and RPs. These findings highlight that the first step in EBP according to Sackett et al. [26], (i.e. seeking and reading research literature) are hard to carry out for the majority of healthcare staff working in the care of older people. To facilitate the accomplishment of EBP in this care setting, one opportunity is that research findings are published as guidelines or summaries in Swedish and in a user-friendly format. However, the oral tradition among nurses is strong [54] and other ways to disseminate information and knowledge than in a printed format also have to be considered.

Swedish municipalities do not have a long tradition of providing and organizing healthcare for older persons. Because of various conditions of the municipalities (such as size, rural and urban populations) numerous types of work organization for healthcare staff exist in the care of older people. For supporting R&D in the care of older people, R&D centers have been set up in collaboration with municipalities, county councils and universities [13, 122]. Because of these new conditions, RNs' use of research in relation to the role as RN and access to R&D resources was investigated in this thesis. No difference regarding research utilization was found between the RNs working as consultants and the RNs working in a team with ENs and NAs in the nursing homes. The RNs working with access to R&D resources reported using research findings more often as well as implementing specific research findings to a greater extent than the RNs working in municipalities without such resources. Research indicates that access to multi-faceted resources and support is associated with increased research use among nurses [79]. We did not have information on what kind of activities that was undertaken at the R&D units in addition to the access to human resources. This allocation of resources is an important signal from top management to unit managers and healthcare staff for creating an awareness of R&D as a significant element in practice.

7.2 WHAT FACTORS SUPPORT OR HINDER RESEARCH UTILIZATION?

To discover factors that should be considered in the development of strategies for enhancing research use in the care of older people associations between research use and diverse factors were examined using multiple-logistic regression models. Two conceptual frameworks were used to identify categories of determinants. In Paper II the PARIHS framework proposed by Rycroft-Malone et al. [32] was used to identify organizational factors. Because of the various educational levels in professional groups and the importance of individual factors in research utilization, we decided to examine the association between individual factors and research use. Although individual factors are not taken into consideration in the PARIHS framework, the categorization presented by Estabrooks et al. [71] was used to classify individual factors. Because of the strong associations between individual factors and research use identified in Paper II, Rogers' theory Diffusion of Innovations [34] was chosen as a conceptual framework for Paper III as this theory takes into account both individual and organizational factors. Three elements in Rogers' theory (the communication channels, the adopter/individual and the social system) were used to categorize independent variables. In present discussion

Rogers' theory is also used to interpret the findings of the four papers, which are structured according to Rogers' elements.

7.2.1 The communication channels

The communication channels can be classified as mass media channels and interpersonal channels [34]. Mass media channels are important in creating awareness of innovations while interpersonal channels are important in forming attitudes to a new idea. Access to research findings was identified as a strong determinant in Papers II-III. This factor was classified as a mass media channel because its potential in disseminating research findings and access to research findings does not include face-to-face communication between individuals. In the review by Meijers et al. multi-faceted access to research related resources was found to be linked to research use [79]. Recent studies have specified access to research-related resources as access to research findings [63] and access to a library [62].

According to Rogers, it is not enough to have access to mass media channels (such as access to nursing literature and the Internet for diffusion of innovations) in that the healthcare staff must also have access to interpersonal channels (i.e. human resources in order to have face-to-face exchange and discussions). These kinds of communication channels are important because it has a greater ability in getting the individual to form an attitude to the innovation. Factors that could be classified as interpersonal channels (e.g., discussing research with colleagues and access to a librarian) were significantly associated with research use in the bivariate analyses but not in the regression models, indicating a link to research use, but not as strong as the factors that were significant in the modeling of research use.

A majority of the RNs reported that one barrier to using research in their practice was that the literature is not compiled in one place and that research reports are not readily available. Another barrier that nearly all of the RNs reported was the lack of knowledgeable colleagues with whom to discuss the research (Paper IV). In previous studies in which the BARRIERS Scale was employed lack of knowledgeable colleagues has not been reported as a top 10 barrier (Paper V). Only a few of the healthcare staff personnel (Paper I) and RNs (Paper III) reported access to research-related resources (both material and human resources) at their workplaces or at the municipal level. Concerning the care of older people, there is a greater lack of research-related resources than there is in hospitals, where several studies have shown that nearly all nurses have access to library and more than half reported access to research findings [47, 52]. Bryar et al. [91] and Kuuppelmäki and Toumi [143] have also identified a larger shortage of information sources in the community-care context as compared with acute care settings. However, the majority of the RNs and RPs in Paper I and the RNs in Paper III reported access to computers with Internet but also that there was low access to research findings. This finding indicates a lack of knowledge or interest on how to use the Internet as a means of accessing websites with research-based information. Such poor knowledge has been identified in previous studies among nurses [144]. Another explanation can be that the healthcare staff did not have access to research-related databases even if they had access to Internet because many of these databases require subscriptions. Furthermore, many of the healthcare staff and the RNs in the present studies (i.e. Papers I and III) reported that they did not know if suggested resources were available. These findings may suggest an actual lack of information sources and "interpersonal channels" at the workplace but they may also indicate a lack of awareness, knowledge or interest for using these kinds of resources.

7.2.2 The adopter - individual

Positive attitudes to research were found to be a strong determinant of research utilization (Papers II-III). Attitudes and beliefs were suggested as the only consistent individual determinants to research utilization in Estabrooks et al.'s review [71]. More

recent studies have confirmed this suggestion [51, 56, 63, 65]. These latter investigators used different instruments (the RUQ, the EROS and the Research Utilization Survey) to measure research use and attitudes to research. These studies demonstrate (as many others studies including the studies of this thesis) that healthcare staff and RNs in general have positive attitudes to research but nevertheless report a moderate use of research findings. Even the respondents who did not use research reported rather positive attitudes to research. Thus, the respondents might have positive attitudes to research but other factors restrain the respondents to act on these 'positive attitudes'. For example, organizational factors (e.g., leadership and organizational culture) are assumed to influence the individual's actions [32, 73-77, 79, 141, 145]. Furthermore, staff's reported positive attitudes might be socially desirable because registered healthcare staff is required to provide care in accordance with science and proven experiences [7].

Educational level was not identified as a determinant of research utilization in Paper II. This study could not distinguish between RNs and RPs with or without university level education. All RNs and RPs were classified as a professional group having university education. However, in Papers III-IV we were able to differentiate between those who had a nursing program before 1982 and those who were trained after 1982, i.e. when research methodology and nursing science became a part of the nursing curricula in Sweden. In this sample the nursing program at the university level was identified as a determinant of research use (Paper III). Furthermore, the RNs having a nursing program at the university level reported fewer barriers to research use on the *Nurse* and *Presentation* subscales than the RNs who were educated under the older nursing program (Paper IV). These findings are consistent with another Swedish study demonstrating that RNs with an older nursing program rated more barriers to research utilization on the *Nurse* and *Presentation* subscales than RNs with a nursing program at the university level [134]. In Estabrooks et al.'s review educational level was found to be one of the most investigated individual factors [71]. Findings were equivocal, however. One proposed explanation was that education had been classified in various ways, from a specific course to types of degrees. A further explanation about the ambiguous findings might be that in many of these studies the intercorrelations between educational level and other individual factors were not examined. The findings from this thesis point to the importance of supporting RNs who have been trained in an older nursing program in order to enhance their knowledge on research methodology and nursing science.

Seeking research related to clinical practice was identified as a determinant in healthcare staff (Paper II). In a study by Milner et al. frequently used information sources with a strong research base were found to be a predictor for research use in clinical nurse educators. Thus, the more use of information sources the more use of research [65]. This 'seeking' behavior is more active than 'just' having or expressing positive attitudes to research. Positive correlations have been found between overall research utilization and critical thinking dispositions (e.g., truth-seeking, open-mindedness, inquisitiveness, maturity, confidence in critical thinking and analyticity) in nurses [64]. However, a Dutch study of ENs working in nursing homes showed that the ENs expressed confidence in the knowledge they acquired during their basic education. They did not see any need for seeking new knowledge and their managers reported that the ENs did not bother to update knowledge [146]. Thus, it seems important to increase a healthcare staff's awareness of the on-going developments in nursing and other fields.

Finally, individual factors (such as positive attitudes to research, a nursing program at the university level and seeking research) were associated with research utilization. Previous research has shown that early adopters differ from later adopters regarding (1) socioeconomic status (e.g., more years of formal education and higher social status), (2) personality variables (e.g., a more favorable attitude to change and science and greater ability to deal with abstractions) and (3) communication behavior (e.g., more social participation, a more active seeking of information and greater exposure to mass media channels) [34]. These aspects of innovation diffusion should be considered in developing strategies for implementing research findings, particularly in the tailoring of specific interventions to meet various needs of individuals.

7.2.3 The social system

In Paper II support from the unit manager was significantly associated with the healthcare staff's research use. Leadership is one of the key elements in the PARIHS framework because of its importance in supporting healthcare staff and in creating an organizational culture that values evidence-based practice [32, 75]. In Rogers' theory change agents and opinion leaders are crucial in forming the norms in the social system regarding innovativeness [34]. This claim is in accordance with many empirical studies; for instance, in the review by Meijers et al. leadership was identified as a contextual determinant of research use [79]. Furthermore, committed leadership on the part of managers is considered critically important for successful improvement of healthcare [145]. However, in Paper III support from unit managers was not associated with research use, not even in the bivariate analyses. This might be explained by the fact that there was only a small proportion of the RNs who reported support from unit managers. The majority reported that they did not know if their unit managers supported implementation of research findings. Nearly all of the ENs and NAs did not know the unit manager's position on this issue (Paper I). Furthermore, many of the RNs answered *no opinion* on items regarding (lack of) support from physicians, other healthcare staff personnel and administrators for research utilization (Paper IV). These *do not know* and *no opinion* answers from the respondents indicate a lack of dialogue between RNs and managers, co-workers and physicians with respect to research utilization.

The RNs rated the *Setting* as the main barrier to research utilization. The majority of the RNs reported lack of adequate facilities and lack of time as barriers to research utilization (Paper IV). The association of several organizational factors with research use was examined in this study. However, the only significant variable in the bivariate analysis within the element Social system (Paper III) was *Care Setting*, indicating that the RNs working in specialist units (such as dementia group dwellings or rehabilitation units) reported more use of research findings than the RNs working in general nursing homes. Furthermore, the RNs in specialist units reported fewer barriers to the *Presentation* subscale as compared with RNs working in general nursing homes (Paper IV). In a Swedish study of RNs work situation in older people care RNs working in a dementia group dwelling reported a higher level of knowledge on dementia, falls and falls injuries and perceived greater possibilities for competence development than RNs working in general nursing homes [147]. This finding is in accordance with the review of Greenhalgh et al., which showed that a healthcare staff working in specialized areas was likely to use research findings to a greater extent than a healthcare staff working in general areas [84]. Specialization might help to focus on a reasonable amount of new knowledge and research findings.

Because a supportive organizational culture or climate is claimed to have a positive relation to research use [32, 73-75, 77], we investigated the association between a creative organizational climate and research use in healthcare staff (Paper II). The three dimensions of organizational climate – *Trust*, *Risk-Taking* and *Challenge* – were associated with research use in the bivariate analyses but not in the regression model of organizational factors. A repeatedly discussed issue in the research utilization literature concerns the factor time. Lack of time is one of the most frequently reported barriers to research utilization (Paper V). Although this factor was investigated in Papers II-III, no significant association with research use was found. Lack of time might be more of a socially acceptable answer for not using research; however, lack of knowledge or interest may be what actually is the reason for not utilizing research findings [148]. In surveys it is easier to answer 'do not have time' instead of providing a more thoughtful response. The respondents' answer that they lack time might instead be considered as a lack in valuing research use than lack of clock time.

The lack of associations between organizational factors and research utilization could be interpreted in several ways. One interpretation is that the context of older people care is underdeveloped regarding support for research utilization. Thus, a few respondents reported access to organizational resources. This explanation implies a lack of variance in the organizational factors for detecting associations with research use in the current

sample. But most importantly, because many of the respondents reported that they did not know (or did not have an opinion), we lack data on how various elements in the working environment might be linked to research utilization.

7.3 IS THE BARRIERS SCALE AN APPROPRIATE INSTRUMENT FOR IDENTIFYING BARRIERS TO RESEARCH UTILIZATION?

After detecting the healthcare staff's low use of research findings and identifying determinants of research use, a natural step in the research process was to consider what kinds of strategies that need to be developed, implemented and evaluated for enhancing research use. According to the literature, one suggested strategy is to identify barriers to research utilization and then implement interventions for overcoming these barriers, which should increase research use [68, 85, 86]. In two reviews of studies using this strategy no study in the field of older people care was identified [85, 86]. The RNs in older people care mainly reported barriers related to the organization and the presentation of research (Paper IV), which is highly similar to RNs in previous BARRIERS' studies (Paper V). These findings suggest that strategies for increasing research use should involve tailored interventions for developing a supportive organization and for facilitating the access to user-friendly research findings. However, the identified barriers were wide-ranging, which makes it difficult to suggest specific interventions for decreasing the barriers.

However, before fully accepting the results from the Barriers Scale, the need for critical methodological appraisal was recognized. The content and construct validity of the BARRIERS Scale has not been thoroughly evaluated [98]. In the review of studies using the BARRIERS Scale only one study had examined associations between perceived barriers and reported research use. This demonstrated one significant association between research use and the *Nurse* subscale [57]. In the reviews by Shaw et al. [85] and Bosch et al. [86] the investigators concluded that there is a lack of knowledge on what barriers are valid and on how to measure them. The validation exercise (Paper IV) demonstrated that the Scale detected confident differences between research users and non-research users. However, the lack of difference on the *Setting* subscale was unexpected in the sense that the *Setting* is known to be an important barrier to research utilization (Paper V). A further analysis of the research users and non-research users reported barriers at the item level revealed that there was conflicting perceptions between the two groups.

One explanation regarding the different opinions might be that the research users in this study were respondents who were aware of research findings and used them accordingly, whereas the non-research users were respondents who not were aware of or not convinced of using research findings. According to Rogers, the research users might be in the implementation stage of the innovation-decision process and thus face several barriers, such as non-supportive or skeptical colleagues for implementing research findings. The non-research users might be in the knowledge or persuasion stages and thus face barriers about lack of information sources. Such an interpretation is supported by a study on Canadian physicians' views of clinical guidelines [149]. The physicians reported that the first barrier for implementing clinical guidelines was lack of knowledge of existing guidelines and lack of a perceived need to change practice. Later on in the implementation process, lack of support from the opinion leader was reported as a barrier. Furthermore, in a study in four nursing homes in the USA, Rogers' innovation-decision process was used to categorize the healthcare staff's perceptions of barriers in using clinical practice guidelines [150]. Similar findings were found as those by Hader et al., i.e. lack of awareness of guidelines and limited education of certified nursing assistants and licensed practical nurse staff in the knowledge stage and limited resources and poor communication in the implementation stage. All together, these findings suggest that healthcare staff's perceptions of barriers differ depending on what stage in the innovation-decision process.

The attributes of the innovation are crucial for its diffusion and implementation [34]. Several studies have shown that nurses report a high awareness of specific nursing practices; however, they also report a highly varied use of these well-known practices [35, 38, 41, 43, 44]. None of these investigators have explored the reasons why nurses use or did not use the practices. Using Rogers' theory regarding the attributes of the innovations, explanations could be that the practices are too complicated to implement or require special resources that the individual nurse does not possess. According to Funk et al. [68], the *Research* subscale in the BARRIERS Scale is considered congruent with the Innovation element in Rogers' theory. The research users reported fewer barriers on this subscale than the non-research users. However, the six items in this subscale primarily refer to the quality of research (e.g., replication of research studies and slow publishing process) and not to attributes such as complexity, advantage and compatibility as suggested by Rogers [34]. Thus, the quality of research as measured by the *Research* subscale is associated with nurses' research use but there is a lack of knowledge on which and to what extent attributes of research findings are associated with nurses' use of research.

The findings in this thesis suggest that identifying barriers to research utilization might be a first step in a useful strategy to enhance the use of research. The BARRIERS Scale appears to detect some appropriate barriers but because these barriers are comprehensive, it is difficult to tailor adequate interventions. There is a lack of knowledge on valid and more specific barriers. It is important to (1) be aware of different perceptions of valid barriers depending on the respondent's 'journey' through the innovation-decision process and (2) the respondent's opinions regarding the attributes of the specific research findings. One strategy might be to first investigate healthcare staff awareness and use of specific practices and then identify barriers relating to the innovation itself, access to and use of mass media and interpersonal channels and the supportiveness of the organization (i.e. managers, colleagues, facilitators or change agents). Because the implementation of research findings is a complex process that takes place in complex organizations [82, 84], there is a need to understand more thoroughly what is obstructing the healthcare staff's use of specific practices and the interventions that could be tailored to reduce identified barriers. This would seem to be a good approach, based on how the innovation-decision process is outlined by Rogers.

7.4 EVIDENCE-BASED CARE OF OLDER PEOPLE – UTOPIA OR REALITY?

The care of older people will increase because of an increased aging population. Thus, a larger number of healthcare staff will be working in this sector. The nursing care will take place in the older person's home or in small settings, such as group dwellings or other special housing accommodations. In these settings most healthcare staff will not have a university education. Nevertheless, society and patients will expect and demand high quality care based on evidence. Concerning evidence-based care of older people, there is an urgent need to develop strategies for enhancing research utilization. Strategies have to take a starting point in identifying determinants and involving all healthcare staff, including ENs and NAs. Even if this study has highlighted the ENs and NAs' low use of research findings, these professional groups should not be blamed for this situation. It is not only the responsibility of the individual EN or RN or even the individual unit manager to make the care of older people more evidence-based; rather, the responsibility for achieving such a national goal involves a joint collaboration of many actors in the healthcare and university systems. In the following paragraphs, some actions are suggested.

There is a need for systematic reviews and national guidelines in Swedish for the care of older people. Such reviews have to be published for diverse target groups with various needs and educational backgrounds. The production of reviews and guidelines requires extensive resources. Today, the SBU and the NBHW publish such reviews and guidelines. There is, however, a need to investigate how such materials should be

designed and disseminated to reach the large group of ENs and NAs in the care of older people.

The universities and nursing colleges have to prepare their students for being ‘critical appraisers and users’ of knowledge, where the results of research are one form of knowledge. Furthermore, knowledge implementation and facilitation of such processes should be subject matter in specialist programs (e.g., specialist nurses in older people care). Currently, R&D units are set up, often in collaboration among municipalities, county councils and universities. It would be very appropriate to focus on how this resource could be used in supporting the dissemination and implementation of EBP and for evaluating such interventions.

Executive directors/Managers in the care of older people have an important task in developing organizational strategies to increase EBP. Strategies to enhance research use should focus on better access to information sources, increased knowledge on research methodology and nursing science, adequate training in the use of information sources and, finally, a supportive organizational structure with an enabling leadership. Community Chief Nurses have a responsibility to provide evidence-based local guidelines and routines. Unit managers need to engage and involve all healthcare staff in discussions on evidence-based practice, particularly ENs and NAs as they constitute the largest proportion of the healthcare staff in the care of older people. One challenge is to communicate the principles of EBP with the ENs and NAs who are less prepared in this field. Health-care professionals with university training will have an important role in facilitating research uptake among ENs and NAs. Finally, to advance the understanding of the processes for increasing research use in the care of older people systematic evaluations have to be performed to understand the effect of interventions on the healthcare staff’s use of research. Evidently, such systematic evaluations are also needed in order to evaluate the outcome for the older person and his/her family.

It should not be a utopia to achieve evidence-based care for older people. Strategies for enhancing a healthcare staff’s utilization of research findings exist, but for becoming a reality, previous allocated resources, such as, the multi-year national initiative by the central government have to be used purposefully to put these strategies into practice. The question is whether to consider older persons worthy of being provided evidence-based care and whether politicians (and ultimately tax payers) are willing to allocate resources in an insightful manner for such a priority.

7.5 FUTURE RESEARCH

There is a strong need to gain a fuller understanding of the research utilization concept and how different professional groups perceive this concept. For instance, the views of ENs and NAs on research and research use in their daily practice require further study. How does a nursing staff without a university education interpret research and research use? What are their perceptions of accurate and useful knowledge for nursing? Such questions are important in advancing the understanding of research use and the quality of care for older people. A better understanding and increased knowledge should be used to develop a new measurement tool for research use, which preferably should be valid and reliable for most settings in healthcare and for all groups of personnel in the healthcare system.

Investigations are needed to understand how various individual and organizational factors relate and interact with each other and with research utilization. There is a need to design studies using existing theories and frameworks in order to evaluate interventions for enhancing research use in the care of older people. Furthermore, researchers should focus on identifying valid barriers of specific nursing practices. In doing so, effective interventions to reduce identified barriers could be developed and evaluated. The evaluations have to include both the perceptions of healthcare staff regarding research use and outcomes for older persons and his/her family.

Research utilization often takes part in complex organizations and systems. Therefore, to acquire a better understanding of the processes and communications between healthcare staff and managers, investigations of nursing homes or other units that are well recognized as providing excellent care for older people would be of value. A more explorative approach should be used because such an approach could reveal processes and activities that could subsequently be transformed into interventions for enhancing research use in other nursing homes and care settings.

8 SVENSK SAMMANFATTNING

Bakgrund

Forskningen inom geriatrik, gerontologisk omvårdnad och rehabilitering har ökat avsevärt och förväntningarna på att kunskapsutvecklingen ska leda till en bättre vård för de äldre är stora. Socialstyrelsen har utvecklat nationella riktlinjer för vård av bland annat patienter med diabetes, men uppföljningar av dessa riktlinjer visade att de inte i någon större utsträckning var kända eller tillämpades i vården. SBU publicerade förra året (2006) en systematisk litteraturoversikt angående demenssjukdomar. Rapportens mål är att ge stöd åt sjukvårds- och omvårdnadspersonal i arbetet med personer med demenssjukdom. Socialstyrelsen arbetar för närvarande med att utveckla nationella riktlinjer för vård, omvårdnad och omsorg för personer med demenssjukdomar som i sin tur ska utgöra underlag till lokala vårdprogram. I Sverige, som i många andra länder, ökar andel äldre och därmed behovet av äldrevård. Sedan 1992 har kommunerna ansvar för vård och omsorg av de äldre i egna boenden samt i särskilda boenden. Trenden de senaste åren är att allt fler av de äldre vårdas i sitt hem eller på sjukhem även de som har stora vårdbehov. I den kommunala äldreomsorgen är 80-90% av personalen är vårdbiträden och undersköterskor, resterande är sjuksköterskor, sjukgymnaster, arbetsterapeuter, arbetsledare m.fl. Socialstyrelsens utvärderingar av äldreomsorgen har bland annat påtalat brister gällande läkemedelshantering, medicinsk-teknisk apparatur och bedömning av patienters tillstånd beroende bland annat på kunskapsbrister hos personalen. Flera studier har påvisat problem med att införa relevant kunskap i klinisk verksamhet. Trots växande forskning inom området Forskningsanvändning är kunskapen ännu begränsad om vilka faktorer som kan påverkas för att underlätta användningen. Därtill har flertalet av dessa studier genomförts inom akutsjukvård/sjukhus, vilket gör det svårt att bedöma om resultaten från de studierna kan överföras till kommunal äldreomsorg.

Syftet med denna avhandling är att inom kommunal äldreomsorg, undersöka vårdpersonals, och framför allt sjuksköterskors användning av forskningsresultat i vårdarbetet.

Material och metod

Avhandlingen bygger på två tvärsnittsstudier. Den första studien är genomförd vid sju enheter i en kommun. All personal (vårdbiträden, undersköterskor, sjuksköterskor, sjukgymnaster, arbetsterapeuter m.fl.) tillfrågades om deltagande. Av de 132 anställda svarade 89 på frågeformulären (67% svarsfrekvens). Den andra studien genomfördes i åtta kommuner. Alla sjuksköterskor (n=210) som arbetade inom äldreomsorgen, tillfrågades om medverkan i studien. 140 personer besvarade frågeformulären (67%).

I den första studien ombads personalen svara på tre frågeformulär, (1) Frågor om forskningsanvändning, (2) Arbetsklimat och (3) Demografiska data (ålder, utbildning mm.). I den andra studien fick sjuksköterskorna också besvara tre frågeformulär, (1) Frågor om forskningsanvändning, (2) Hinder och möjligheter för användning av forskningsresultat i klinisk verksamhet och (3) Demografiska data (ålder, utbildning mm.) Den medicinskt ansvariga sjuksköterskan (MAS) (n=8) i respektive kommun tillfrågades om resurser för FoU inom kommunen och om sjuksköterskornas arbetsorganisation.

Resultat

Vårdpersonalen hade i stort en positiv uppfattning om forskning men knappt en tredjedel av personalen instämde i att de använde forskningsresultat i vårdarbetet. Sjuksköterskor och rehabiliteringspersonal (sjukgymnaster, arbetsterapeuter m.fl.) rapporterade mer användning av forskningsresultat och positivare attityder till forskning än undersköterskor och vårdbiträden. Av sjuksköterskorna rapporterade 45% att de använde forskningsresultat i vårdarbetet. En femtedel (21%) svarade att de tillämpade specifika forskningsresultat.

Vårdpersonalen rapporterade överlag en bristande tillgång till resurser för att söka information. Nästan hälften av vårdpersonalen hade tillgång till Internet och 28 % hade tillgång till bibliotek med aktuella tidskrifter och böcker. Sjuksköterskorna och rehabiliteringspersonalen rapporterade däremot en bättre tillgång till datorer med Internet och till bibliotek. Det var fler som rapporterade tillgång till Internet än tillgång till forskningsresultat på arbetsplatsen, vilket visar på en bristande kunskap eller intresse för att använda datorer som redskap för forskningsinformation. Enbart 10 % av undersköterskorna och vårdbiträdena rapporterade att närmaste chefen stödjer användning av forskningsresultat i vården jämfört med 77% av sjuksköterskor och rehabiliteringspersonal (Studie I). I studien av de åtta kommunerna var det 34% av sjuksköterskorna som rapporterade att chefen stödjer forskningsanvändning. Sextiotre procent av sjuksköterskorna (studie II) och 86% av undersköterskorna och vårdbiträdena (Studie I) kunde inte ta ställning till om deras chef var positiv till detta. De sjuksköterskor som hade tillgång till FoU-resurser inom sin kommun rapporterade mer användning av forskningsresultat, mer stöd av sin chef och bättre tillgång till forskningsresultat på sin arbetsplats än de sjuksköterskor som inte hade tillgång till denna resurs. Det fanns ingen skillnad i sjuksköterskornas användning av forskningsresultat i förhållande till om sjuksköterskan arbetade som konsult till eller i team med undersköterskor och vårdbiträden.

De individuella faktorerna ”Positiva attityder till forskning” och ”Aktivt sökande efter forskningsrön” samt de organisatoriska faktorerna ”Tillgång till forskningsresultat” och ”Stödjande ledarskap” hade ett samband med användning av forskningsresultat i gruppen vårdpersonal (Studie I). Faktorerna ”Tillgång till forskningsresultat”, ”Positiva attityder till forskning” och ”Sjuksköterskeutbildning efter 1982” (högskoleutbildning) hade ett samband med forskningsanvändning i sjuksköterskegruppen (Studie II).

Sjuksköterskorna i studie II ansåg att förhållanden i organisationen samt hur forskningen var presenterad och tillgången till forskningsresultat hindrade dem från att använda forskningsresultat i vårdarbetet. Mer än 80% av sjuksköterskorna svarade att följande påstående var ett hinder ”Sjuksköterskan har inte forskarutbildade kollegor med vilka hon kan diskutera forskning”, ”Resurserna för att omsätta forskningsresultat i praktiken är otillräckliga” och ”Den relevanta litteraturen finns inte samlad på ett ställe”. Sjuksköterskorna föreslog följande för att underlätta forskningsanvändning: Stöd från chefen, kollegor och vårdutvecklare, avsatt tid för att läsa, diskutera och tillämpa forskning i vården samt populärvetenskapliga sammanställningar på svenska, som bör finnas lättillgängliga på arbetsplatsen. De sjuksköterskor, som rapporterade att de använde sig av forskningsresultat i arbetet uppfattade färre hinder relaterade till sjuksköterskans kompetens och attityder, presentation av forskningen samt forskningens kvalitet jämfört med de sjuksköterskor som rapporterade att de inte använde forskningsresultat i vårdarbetet. Det fanns ingen skillnad i uppfattning om hinder mellan sjuksköterskor som använde forskning jämfört med ”icke-användare” vad gällde förhållanden i organisationen.

Slutsats

Resultaten i denna avhandling visar att det finns en stor potential att öka vårdpersonalens användning av forskningsresultat i kommunal äldreomsorg. Trots positiva attityder till forskning användes forskningsresultat i liten utsträckning. För att öka användningen av forskningsresultat bör strategier inbegripa aktiviteter som omfattar både organisatoriska som individuella aspekter. För att uppnå målet en evidensbaserad äldreomsorg krävs insatser från många aktörer inom hälso- och sjukvården, kommunala omsorgen och utbildningssystemet. SBU och Socialstyrelsen behöver utforma sammanställningar av forskning på ett lättillgängligt sätt för all vårdpersonal. Vårdutbildningarna på gymnasie- och högskolenivå måste förbereda studenterna att vara kritiska forskningskonsumenter. FoU-enheter kan medverka till att stödja spridning och införande av nya rön och samtidigt utvärdera dessa insatser för att erhålla kunskap om olika insatsers effekt. Förvaltningschefer för äldreomsorgen måste utarbeta strategier för att öka personalens användning av forskningsresultat i sitt arbete. Enhetscheferna har en viktig funktion att involvera och stödja all personal i diskussionen om och utveckling av en evidensbaserad äldreomsorg.

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10 REFERENCES

1. SBU: *Evidensbaserad äldrevård. En inventering av det vetenskapliga underlaget. (Geriatric Care and Treatment. A systematic compilation of existing scientific literature).* (In Swedish). Stockholm, Sweden; 2003.
2. SBU: *Demenssjukdomar - en systematisk litteraturöversikt (Dementia - a systematic literature review)* (In Swedish). Stockholm, Sweden; 2006.
3. The National Board of Health and Welfare: *God vård i livets slut. En kunskapsöversikt om vård och omsorg av äldre. (Good care in end of life. A literature review on care of older people)* (In Swedish). Stockholm, Sweden; 2004.
4. The National Board of Health and Welfare: *Nationella riktlinjer för vård och behandling vid diabetes mellitus. (National Guidelines for Diabetes Care).* Stockholm (In Swedish). 1999.
5. The National Board of Health and Welfare: *Nationella riktlinjer för strokesjukvård. (National Guidelines for Stroke Care).* (In Swedish). Stockholm, Sweden. 2000.
6. The National Board of Health and Welfare: *Nationella riktlinjer för demenssjukvård (National guidelines for dementia)* (In Swedish)
7. SFS 1998:531 *Lag om yrkesverksamhet på hälso- och sjukvårdens område. (Act on Professional Activity in the Field of Health and Medical Care).* (In Swedish). Liber, Allmänna förlaget. Stockholm. 1998.
8. The National Board of Health and Welfare: *Uppföljning av diabetesvård. (Evaluation of the national guidelines for diabetes care).* (In Swedish). Stockholm, Sweden. 2001.
9. The National Board of Health and Welfare: *Kranskärllssjukvård - tillämpning av de nationella riktlinjerna. (Cardiac care - application of the national guidelines).* (In Swedish). Stockholm, Sweden. 2003.
10. Grol R, Grimshaw J: **From best evidence to best practice: effective implementation of change in patients' care.** *Lancet* 2003, **362**:1225-1230.
11. Statistics Sweden: *Recent Demographic Developments in Europe 2003.* Stockholm, Sweden; 2004.
12. Johansson L: **Decentralisation from acute to home care settings in Sweden.** *Health Policy* 1997, **41 (Suppl)**:131-143.
13. The National Board of Health and Welfare: *Vård och omsorg om äldre. Lägesrapport 2006. (Elderly care 2006).* (In Swedish). Stockholm, Sweden. 2007.
14. Evidence-Based Medicine Working Group. **Evidence-based medicine. A new approach to teaching the practice of medicine.** *JAMA* 1992, **268**:2420-2425.
15. Cochrane A: *Effectiveness & Efficiency. Random Reflections on Health Services.* London: The Royal Society of Medicine Press Limited; 1975.
16. Miles A, Loughlin M, Polychronis A: **Medicine and evidence: knowledge and action in clinical practice.** *J Eval Clin Pract* 2007, **13**:481-503.
17. Ketefian S: **Application of selected nursing research findings into nursing practice: a pilot study.** *Nurs Res* 1975, **24**:89-92.
18. Estabrooks CA, Scott-Findlay S, Winther C: **A Nursing and Allied Health Sciences Perspective on Knowledge Utilization.** In *Using Knowledge and Evidence in Health Care Multidisciplinary Perspectives.* Edited by Lemieux-Charles L, Champagne F. Toronto: University of Toronto Press; 2004
19. Polit DF, Hungler, B.P.: *Nursing Research: Principles and Methods. 6th ed.* 6th edn. Philadelphia, PA: Lippincott; 1999.
20. Estabrooks CA, Wallin L, Milner M: **Measuring knowledge utilization in health care.** *International Journal of Policy Evaluation & Management* 2003, **1**:3-36.
21. Furåker C: *Styrning och visioner : sjuksköterskeutbildning i förändring.* Thesis. (In Swedish). Göteborg : Acta Universitatis Gothoburgensis, 2001.
22. Björkström M: *Den professionella sjuksköterska- i relation till den akademiska sjuksköterskeutbildningen.* (The Professional Nurse - in relation to Academic

- Nursing Education). Thesis. (In Swedish). Karlstad : Institutionen för hälsa och vård, Karlstads universitet, 2005.
23. Dunn WN: **Measuring knowledge use.** *Knowledge: Creation, Diffusion, Utilization* 1983, **5**:120-133.
 24. Stetler CB: **Refinement of the Stetler/Marram model for application of research findings to practice.** *Nurs Outlook* 1994, **42**:15-25.
 25. Estabrooks CA: **The conceptual structure of research utilization.** *Res Nurs Health* 1999, **22**:203-216.
 26. Sackett D, Richardson W, Rosenberg W, Haynes R: *Evidence-based Medicine How to practice & Teach EBM.* New York: Churchill Livingstone; 2000.
 27. Rycroft-Malone J, Seers K, Titchen A, Harvey G, Kitson A, McCormack B: **What counts as evidence in evidence-based practice?** *J Adv Nurs* 2004, **47**:81-90.
 28. Scott-Findlay S, Pollock C: **Evidence, research, knowledge: a call for conceptual clarity.** *Worldviews Evid Based Nurs* 2004, **1**:92-97.
 29. Graham ID, Logan J, Harrison MB, Straus SE, Tetroe J, Caswell W, Robinson N: **Lost in knowledge translation: time for a map?** *J Contin Educ Health Prof* 2006, **26**:13-24.
 30. Goode C, Bulechek GM: **Research utilization: an organizational process that enhances quality of care.** *Journal of Nursing Care Quality* 1992, **Spec**:27-35.
 31. Titler MG, Kleiber C, Steelman V, Goode C, Rakel B, Barry-Walker J, Small S, Buckwalter K: **Infusing research into practice to promote quality care.** *Nursing Research* 1994, **43**(5):307-13.
 32. Rycroft-Malone J, Kitson A, Harvey G, McCormack B, Seers K, Titchen A, Estabrooks C: **Ingredients for change: revisiting a conceptual framework.** *Qual Saf Health Care* 2002, **11**:174-180.
 33. Estabrooks CA, Thompson DS, Lovely JJ, Hofmeyer A: **A guide to knowledge translation theory.** *J Contin Educ Health Prof* 2006, **26**:25-36.
 34. Rogers EM: *Diffusion of innovations.* Free Press (New York, NY) 5 ed; 2003.
 35. Brett JLL: **Use of nursing practice research findings.** *Nursing Research* 1987, **36**(6):344-9.
 36. Michel Y, Sneed NV: **Dissemination and use of research findings in nursing practice.** *Journal of Professional Nursing* 1995, **11**(5):306-11.
 37. Brett JLL: **Organizational integrative mechanisms and adoption of innovations by nurses.** *Nursing Research* 1989, **38**(2):105-10.
 38. Coyle LA, Sokop AG: **Innovation adoption behavior among nurses.** *Nursing Research* 1990, **39**(3):176-80.
 39. Thompson CJ: **Extent and factors influencing research utilization among critical care nurses.** Texas Woman's University, College of Nursing. United States of America. 1989.
 40. Barta KM: **Information-seeking, research utilization, and barriers to research utilization of pediatric nurse educators.** *Journal of Professional Nursing* 1995, **11**(1):49-57.
 41. Berggren A: **Swedish midwives' awareness of, attitudes to and use of selected research findings.** *Journal of Advanced Nursing* 1996, **23**(3):462-70.
 42. Rodgers SE: **The extent of nursing research utilization in general medical and surgical wards.** *Journal of Advanced Nursing* 2000, **32**(1):182-93.
 43. Rutledge DN, Greene P, Mooney K, Nail LM, Ropka M: **Use of research-based practices by oncology staff nurses.** *Oncology Nursing Forum* 1996, **23**(8):1235-44.
 44. Squires JE, Moralejo D, Lefort SM: **Exploring the role of organizational policies and procedures in promoting research utilization in registered nurses.** *Implement Sci* 2007, **2**:17.
 45. Champion VL, Leach A: **Variables related to research utilization in nursing: an empirical investigation.** *J Adv Nurs* 1989, **14**:705-710.
 46. Hatcher S, Tranmer J: **A survey of variables related to research utilization in nursing practice in the acute care setting.** *Canadian Journal of Nursing Administration* 1997, **10**(3):31-53.

47. Humphris D, Hamilton S, O'Halloran P, Fisher S, Littlejohns P: **Do diabetes nurse specialists utilise research evidence?** *Practical Diabetes International* 1999, **16**(2):47-50.
48. Humphris D, Littlejohns P, Victor C, O'Halloran P, Peacock J: **Implementing evidence-based practice: factors that influence the use of research evidence by occupational therapists.** *British Journal of Occupational Therapy* 2000, **63**(11):516-22.
49. Lacey EA: **Research utilization in nursing practice -- a pilot study.** *Journal of Advanced Nursing* 1994, **19**(5):987-95.
50. Ohrn K, Olsson C, Wallin L: **Research utilization among dental hygienists in Sweden -- a national survey.** *International Journal of Dental Hygiene* 2005, **3**(3):104-11.
51. Tranmer JE, Lochhaus-Gerlach J, Lam M: **The effect of staff nurse participation in a clinical nursing research project on attitude towards, access to, support of and use of research in the acute care setting.** *Canadian Journal of Nursing Leadership* 2002, **15**(1):18-26.
52. Wallin L, Bostrom AM, Wikblad K, Ewald U: **Sustainability in changing clinical practice promotes evidence-based nursing care.** *J Adv Nurs* 2003, **41**:509-518.
53. Pain K, Hagler P, Warren S: **Development of an instrument to evaluate the research orientation of clinical professionals.** *Canadian Journal of Rehabilitation Winter* 1996, **9**(2):93-100.
54. Henderson A, Winch S, Holzhauser K, De Vries S: **The motivation of health professionals to explore research evidence in their practice: an intervention study.** *Journal of Clinical Nursing* 2006, **15**(12):1559-64.
55. McCleary L, Brown GT: **Use of the Edmonton Research Orientation Scale with nurses.** *Journal of Nursing Measurement Winter* 2002, **10**(3):263-75.
56. McCleary L, Brown GT: **Research utilization among pediatric health professionals.** *Nursing & Health Sciences* 2002, **4**(4):163-71.
57. McCleary L, Brown GT: **Barriers to paediatric nurses' research utilization.** *Journal of Advanced Nursing* 2003, **42**:364-372.
58. Pain K, Magill-Evans J, Darragh J, Hagler P, Warren S: **Effects of profession and facility type on research utilization by rehabilitation professionals.** *Journal of Allied Health Spring* 2002, **33**(1):3-9.
59. Waive M, Magill-Evans J, Pain K: **Alberta occupational therapists' perspectives on and participation in research.** *Canadian Journal of Occupational Therapy Apr* 1997, **64**(2):82-8.
60. Estabrooks CA: **Mapping the research utilization field in nursing.** *Can J Nurs Res* 1999, **31**:53-72.
61. Estabrooks CA, Chong H, Brigidear K, Profetto-McGrath J: **Profiling Canadian nurses' preferred knowledge sources for clinical practice.** *Can J Nurs Res* 2005, **37**:118-140.
62. Estabrooks CA, Kenny DJ, Adewale AJ, Cummings GG, Mallidou AA: **A comparison of research utilization among nurses working in Canadian civilian and United States Army healthcare settings.** *Res Nurs Health* 2007, **30**:282-296.
63. Kenny DJ: **Nurses' use of research in practice at three US Army hospitals.** *Canadian Journal of Nursing Leadership* 2005, **18**(3):45-67.
64. Profetto-McGrath J, Hesketh KL, Lang S, Estabrooks CA: **A study of critical thinking and research utilization among nurses.** *Western Journal of Nursing Research* 2003, **25**(3):322-37.
65. Milner FM, Estabrooks CA, Humphrey C: **Clinical nurse educators as agents for change: increasing research utilization.** *Int J Nurs Stud* 2005, **42**:899-914.
66. Stetler CB, DiMaggio G: **Research utilization among clinical nurse specialists.** *Clinical Nurse Specialist* 1991, **5**(3):151-5.
67. Estabrooks CA: **Research utilization and qualitative research.** In *The Nature of Qualitative Evidence*. Edited by J.M. Morse JSAJK. Thousand Oaks, CA: Sage; 2001: 275-293

68. Funk SG, Champagne MT, Wiese RA, Tornquist EM: **BARRIERS: the barriers to research utilization scale.** *Appl Nurs Res* 1991, **4**:39-45.
69. Thompson C, McCaughan D, Cullum N, Sheldon TA, Mulhall A, Thompson DR: **The accessibility of research-based knowledge for nurses in United Kingdom acute care settings.** *J Adv Nurs* 2001, **36**:11-22.
70. Estabrooks CA, Chong H, Brigidear K, Profetto-McGrath J: **Profiling Canadian Nurses' Preferred Knowledge Sources for Clinical Practice** *CJNR* 2005, **37**:118-140.
71. Estabrooks CA, Floyd JA, Scott-Findlay S, O'Leary KA, Gushta M: **Individual determinants of research utilization: a systematic review.** *J Adv Nurs* 2003, **43**:506-520.
72. Estabrooks CA: **Translating research into practice: implications for organizations and administrators.** *Can J Nurs Res* 2003, **35**:53-68.
73. Fink R, Thompson CJ, Bonnes D: **Overcoming barriers and promoting the use of research in practice.** *J Nurs Adm* 2005, **35**:121-129.
74. Gerrish K, Clayton J: **Promoting evidence-based practice: an organizational approach.** *J Nurs Manag* 2004, **12**:114-123.
75. McCormack B, Kitson A, Harvey G, Rycroft-Malone J, Titchen A, Seers K: **Getting evidence into practice: the meaning of 'context'.** *Journal of Advanced Nursing* 2002, **38**(1):94-104.
76. Newman M, Papadopoulos I, Sigsworth J: **Barriers to evidence-based practice.** *Intensive & Critical Care Nursing* 1998, **14**(5):231-8.
77. Scott-Findlay S, Golden-Biddle K: **Understanding how organizational culture shapes research use.** *J Nurs Adm* 2005, **35**:359-365.
78. Stetler CB: **Role of the organization in translating research into evidence-based practice.** *Outcomes Manag* 2003, **7**:97-103.
79. Meijers JM, Janssen MA, Cummings GG, Wallin L, Estabrooks CA, R YGH: **Assessing the relationships between contextual factors and research utilization in nursing: systematic literature review.** *J Adv Nurs* 2006, **55**:622-635.
80. Cummings GG, Estabrooks CA, Midodzi WK, Wallin L, Hayduk L: **Influence of organizational characteristics and context on research utilization.** *Nurs Res* 2007, **56**:S24-39.
81. Estabrooks CA, Midodzi WK, Cummings GG, Wallin L: **Predicting research use in nursing organizations: a multilevel analysis.** *Nurs Res* 2007, **56**:S7-23.
82. Dopson S, Fitzgerald L: *Knowledge to action? Evidence-based health care in context.* Oxford: Oxford University Press; 2006.
83. French B: **The process of research use in nursing.** *J Adv Nurs* 2005, **49**:125-134.
84. Greenhalgh T, Robert G, Macfarlane F, Bate P, Kyriakidou O: **Diffusion of innovations in service organizations: systematic review and recommendations.** *Milbank Q* 2004, **82**:581-629.
85. Shaw B, Cheater F, Baker R, Gillies C, Hearnshaw H, Flottorp S, Robertson N: **Tailored interventions to overcome identified barriers to change: effects on professional practice and health care outcomes.** *Cochrane Database Syst Rev* 2005:CD005470.
86. Bosch M, van der Weijden T, Wensing M, Grol R: **Tailoring quality improvement interventions to identified barriers: a multiple case analysis.** *J Eval Clin Pract* 2007, **13**:161-168.
87. Hutchinson AM, Johnston L: **Beyond the BARRIERS Scale: commonly reported barriers to research use.** *J Nurs Adm* 2006, **36**:189-199.
88. Bobo CM: *A study of the impact of using electronic mail to disseminate nursing research on nurses' perceptions of barriers to research utilization.* Florida Atlantic University, Boca Raton, Florida, United States of America., 1997.
89. Kirshbaum M, Beaver K, Luker KA: **Perspectives of breast care nurses on research dissemination and utilisation.** *Clinical Effectiveness in Nursing* 2004, **8**(1):47-58.
90. LaPierre E, Ritchey K, Newhouse R: **Barriers to research use in the PACU.** *Journal of PeriAnesthesia Nursing* 2004, **19**(2):78-83.

91. Bryar RM, Closs SJ, Baum G, Cooke J, Griffiths J, Hostick T, Kelly S, Knight S, Marshall K, Thompson DR: **The Yorkshire BARRIERS project: diagnostic analysis of barriers to research utilisation.** *Int J Nurs Stud* 2003, **40**:73-84.
92. Parahoo K, McCaughan EM: **Research utilization among medical and surgical nurses: a comparison of their self reports and perceptions of barriers and facilitators.** *J Nurs Manag* 2001, **9**:21-30.
93. Nilsson Kajermo K, Nordstrom G, Krusebrant A, Bjorvell H: **Perceptions of research utilization: comparisons between health care professionals, nursing students and a reference group of nurse clinicians.** *J Adv Nurs* 2000, **31**:99-109.
94. Rutledge DN, Ropka M, Greene PE, Nail L, Mooney KH: **Barriers to research utilization for oncology staff nurses and nurse managers/clinical nurse specialists.** *Oncol Nurs Forum* 1998, **25**:497-506.
95. Nilsson Kajermo K, Nordstrom G, Krusebrant A, Bjorvell H: **Barriers to and facilitators of research utilization, as perceived by a group of registered nurses in Sweden.** *J Adv Nurs* 1998, **27**:798-807.
96. Oranta O, Routasalo P, Hupli M: **Barriers to and facilitators of research utilization among Finnish registered nurses.** *J Clin Nurs* 2002, **11**:205-213.
97. Patiraki E, Karlou C, Papadopoulou D, Spyridou A, Kouloukoura C, Bare E, Merkouris A: **Barriers in implementing research findings in cancer care: the Greek registered nurses perceptions.** *Eur J Oncol Nurs* 2004, **8**:245-256.
98. Gerrish K, Ashworth P, Lacey A, Bailey J, Cooke J, Kendall S, McNeilly E: **Factors influencing the development of evidence-based practice: a research tool.** *J Adv Nurs* 2007, **57**:328-338.
99. WHO: *Social Development and Ageing Crisis or Opportunity?* Geneva: World Health Organization; 2002.
100. SALAR: *Care of elderly in Sweden today. 2006.* Stockholm: The Swedish Association of Local Authorities and Regions.; 2007.
101. Larsson K, Thorslund M: **Chapter 8: old people's health.** *Scand J Public Health Suppl* 2006, **67**:185-198.
102. Parker MG, Thorslund M: **Health trends in the elderly population: getting better and getting worse.** *Gerontologist* 2007, **47**:150-158.
103. The National Board of Health and Welfare: *Demenssjukdomarnas samhällskostnader och antalet dementa i Sverige 2005. (Dementia costs for society and numbers of persons suffering from dementia in Sweden 2005.)*. (In Swedish). Stockholm, Sweden. 2007.
104. SFS 1982:783: *Hälso- och sjukvårdslagen (The Health and Medical Services Act)*. (In Swedish). Stockholm: Liber, Allmänna förlaget. Stockholm. 1982.
105. The National Board of Health and Welfare: *SOSFS 1993:10 Socialstyrelsens allmänna råd. Medicinskt ansvarig sjuksköterska i kommunernas häls- och sjukvård. (National Board of Health and Welfare: Community Chief Nurse in the municipalities' health care)*. (In Swedish) Stockholm, Sweden. 1993.
106. SFS 1992:1434 *Högskolelagen. (Higher Education Act Law)*. (In Swedish) Stockholm, Sweden. 1992.
107. SFS 1993:100 *Högskoleförordningen. (Higher Education Ordinance)*. (In Swedish). Stockholm, Sweden. 1993.
108. The Associations of Health Professionals: *Sjuksköterskorna inom äldre vården. Rapport 1 (The registered nurses in the care of older people. Report 1)*. (In Swedish) Stockholm, Sweden. 2004.
109. Fahlström G: *Ytterst i organisationen. Om undersköterskor, vård- och sjukvårdsbiträden i äldreomsorg. (At the farthest end of the organisation. About home helpers, nurse aides and nursing assistant nurse in elderly care)*. Thesis. Uppsala Universitet, 1999.
110. Törnquist A: *Vad man ska kunna och hur man ska vara. En studie om enhetschefer och vårdbiträdens yrkeskompetens inom äldreomsorgens särskilda boendeformer. (What to do and how to be. A study of unit managers and nurse aides professional skills within the institutions od eldercare.)* Thesis. Lärarhögskolan i Stockholm (The Stockholm Institute of Education). 2004.

111. The National Board of Health and Welfare: *Vård- och omsorgsassistenters kompetens - en litteraturgenomgång. (Nursing and caring assistants competence - literature review)*. (In Swedish). Stockholm, Sweden. 2006.
112. The National Board of Health and Welfare: *Tid för vård och omsorg. Hur använder personalen inom vården och omsorgen om äldre och funktionshindrade personer sin tid? (Time for care. How does staff in elderly and handicap care their time?)*. (In Swedish). Stockholm, Sweden. 2005.
113. Josefsson K: *Municipal elderly care: Implications of registered nurses' work situation, education, and competence*. Thesis. Karolinska Institutet, Dept NVS; 2006.
114. Westlund P, Larsson, E.: *Kommunens sjuksköterska i Florence anda. (The community nurse in the spirit of Florence)*. (In Swedish). Kalmar: Fokus Kalmar län; 2001.
115. Tunedal U, Fagerberg, I.: **Sjuksköterska inom äldreomsorgen - en utmaning. (The challenge of being a nurse in community elderly care.)**. *Vård i Norden* 2001, **2**:27-32. (In Swedish).
116. Karlsson I: *Förväntningar och realitet för sjuksköterskor verksamma på äldreboenden. (Expectations and reality for registered nurses working in nursing homes)*. Thesis. Karolinska Institutet, Dept NVS; 2007.
117. Weman K, Kihlgren M, Fagerberg I: **Older people living in nursing homes or other community care facilities: Registered Nurses' views of their working situation and co-operation with family members**. *J Clin Nurs* 2004, **13**:617-626.
118. Josefsson K, Sonde L, Winblad B, Robins Wahlin TB: **Work situation of registered nurses in municipal elderly care in Sweden: a questionnaire survey**. *Int J Nurs Stud* 2007, **44**:71-82.
119. SALAR: *National Healthcare Quality Registries in Sweden 2005*. Stockholm, Sweden: The Swedish Association of Local Authorities and Regions.; 2005.
120. SALAR: *Öppna jämförelser 2007 Äldreomsorg. (Open comparisons 2007 Elderly care)*. (In Swedish). Stockholm, Sweden. 2007.
121. Marcusson J, Hoffman W, Klinge S, Minthon L, Sandman PO, Stromqvist J, Sundin Y, Wahlund LO, Wimo A: **[There is a need to reform dementia care. Resources are not used optimally--time for evidence-based care]**. *Lakartidningen* 2006, **103**:1022-1024, 1027-1028.
122. The National Board of Health and Welfare: *FoU-miljöer på äldreområdet. En explorativ studie med fokus på bidrag till utveckling av vård och omsorg för äldre. (R&D centres in elderly care. An explorative study focusing on the contribution of development in elderly care)*. (In Swedish). Stockholm, Sweden. 2007.
123. Pettengill MM, Gillies DA, Clark CC: **Factors encouraging and discouraging the use of nursing research findings**. *Image: Journal of Nursing Scholarship* 1994, **26**(2):143-7.
124. Ekvall G: **Organizational climate for creativity and innovation**. *European Journal of Work and Organizational Psychology* 1996, **5**:105-123.
125. Polit D: *Data analysis & statistics for nursing research*. Stamford, CT.: Appleton & Lange; 1996.
126. MFR: *Riktlinjer för etisk värdering av medicinsk humanforskning. Forsknings-etisk policy och organisation i Sverige. (Rapport 2) (Roles and guidelines for research. Human subjects research)*. (In Swedish) Medicinska forskningsrådet. Stockholm, 2000.
127. Brink P, Wood M: *Advanced design in nursing research*. London : SAGE; 1998.
128. Berg A, Hansson UW, Hallberg IR: **Nurses' creativity, tedium and burnout during 1 year of clinical supervision and implementation of individually planned nursing care: comparisons between a ward for severely demented patients and a similar control ward**. *J Adv Nurs* 1994, **20**:742-749.
129. Johansson G: *Jämförelse av organisationsklimatet vid fyra sjukhemsavdelningar (Comparisons of organizational climate at four nursing homes)*. Master thesis. Umeå university, Dept of nursing; 1997.

130. Mattiasson AC, Andersson L: **Organizational environment and the support of patient autonomy in nursing home care.** *J Adv Nurs* 1995, **22**:1149-1157.
131. Norbergh KG, Hellzen O, Sandman PO, Asplun K: **The relationship between organizational climate and the content of daily life for people with dementia living in a group-dwelling.** *J Clin Nurs* 2002, **11**:237-246.
132. Andersson N, Cederfjäll C, Jylli L, Nilsson Kajermo K, Klang B: **Professional roles and research utilization in paediatric care: newly graduated nurses experiences.** *Scand J Caring Sci* 2007, **21**:91-97.
133. Nilsson Kajermo K, Undén M, Gardulf A, Eriksson L, Orton M, Arnetz B, Nordström G: **Predictors of nurses' perceptions of barriers to research utilization.** *Journal of Nursing Management*, in press.
134. Nilsson Kajermo K: *Research utilisation in nursing practice - barriers and facilitators.* Thesis. Karolinska Institutet, Dept of Nursing; 2004.
135. Krosnick JA, Holbrook AL, Berent MK, Carson RT, Hanemann WM, Kopp RJ, Mitchell RC, Presser S, Ruud PA, Smith VK, et al: **The impact of "no opinion" response options on data quality: Non-attitude reduction or an invitation to satisfice?** *Public Opinion Quarterly* 2002, **66**(3):371-403.
136. Hair JF, Anderson RE, Tatham RL, Black WC: *Multivariate Data Analysis.* London: Prentice Hall International; 1998.
137. Eccles M, Grimshaw J, Walker A, Johnston M, Pitts N: **Changing the behavior of healthcare professionals: the use of theory in promoting the uptake of research findings.** *J Clin Epidemiol* 2005, **58**:107-112.
138. MacCallum RC, Zhang S, Preacher KJ, Rucker DD: **On the practice of dichotomization of quantitative variables.** *Psychological Methods* 2002, **7**(1):19-40.
139. The National Board of Health and Welfare: *Kompetensförsörjning inom kommunernas vård och omsorg om äldre. Lägesrapport 2006. (Manpower Supply in elderly care in 2006).* (In Swedish). Stockholm. 2007.
140. Carper B: **Fundamental patterns of knowing in nursing.** *Advances in Nursing Science* 1978, **1**:13-23.
141. Rycroft-Malone J, Harvey G, Seers K, Kitson A, McCormack B, Titchen A: **An exploration of the factors that influence the implementation of evidence into practice.** *J Clin Nurs* 2004, **13**:913-924.
142. Bucknall T: **A gaze through the lens of decision theory toward knowledge translation science.** *Nurs Res* 2007, **56**:S60-66.
143. Kuuppelomaki M, Tuomi J: **Finnish nurses' views on their research activities.** *Journal of Clinical Nursing* 2003, **12**(4):589-600.
144. Estabrooks CA, O'Leary KA, Ricker KL, Humphrey CK: **The Internet and access to evidence: how are nurses positioned?** *J Adv Nurs* 2003, **42**:73-81.
145. Ovretveit J: **Leading improvement.** *J Health Organ Manag* 2005, **19**:413-430.
146. Buss IC, Halfens RJG, Abu-Saad HH, Kok G: **Pressure ulcer prevention in nursing homes: views and beliefs of enrolled nurses and other health care workers.** *Journal of Clinical Nursing* 2004, **13**(6):668-76.
147. Josefsson K, Sonde L, Wahlin TB: **Registered nurses' education and their views on competence development in municipal elderly care in Sweden: a questionnaire survey.** *Int J Nurs Stud* 2007, **44**:245-258.
148. Tydén T: *Knowledge Interplay. User-Oriented Research Dissemination through Synthesis Pedagogics.* Thesis. Acta Universitatis Upsaliensis, 1993.
149. Hader JM, White R, Lewis S, Foreman JL, McDonald PW, Thompson LG: **Doctors' views of clinical practice guidelines: a qualitative exploration using innovation theory.** *J Eval Clin Pract* 2007, **13**:601-606.
150. Colon-Emeric CS, Lekan D, Utley-Smith Q, Ammarell N, Bailey D, Corazzini K, Piven ML, Anderson RA: **Barriers to and facilitators of clinical practice guideline use in nursing homes.** *J Am Geriatr Soc* 2007, **55**:1404-1409.