Getting evidence into nursing practice: roles of the social context

For reasons of consistency within this thesis, some terms have been standardized throughout the text. As a consequence the text may differ in this respect from the articles that have been published.

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Contents

Chapter 1

Introduction

Studies in the United States and the Netherlands suggest that about 30 to 40% of patients do not receive care in line with current evidence[1-4] and about 20 to 25% of the care provided is not needed or is even potentially harmful.[5] Care provided is often incongruent with protocols, guidelines, procedures or regulatory requirements.[6] Apparently, implementing new research findings into daily routine practice is a slow, unpredictable and haphazard process.[2]

Bridging the gap between research and practice requires a shift from both experience based care and common sense based care toward evidence based care.[7] Several initiatives have been undertaken to narrow the gap between research and practice and to ensure that research is translated into clinical practice as effectively and efficiently as possible. These initiatives include the development of national guidelines, the establishment of knowledge expertise centers and the development of research programs to investigate and develop effective methods and processes for the implementation of Evidence-Based Practice in nursing. However, these initiatives are not sufficient: Evidence-Based Practice is not yet common practice in nursing. This is understandable, since the translation and use of evidence in the daily practice of nurses involve complex interactions and planned changes of individuals, teams and organizations.[8,9] Even so, it is obvious that there is a need for more evidence on how these changes can be accomplished.[10]

Changes require a systematic approach with good preparation and planning, such as described in the implementation model of Grol, Eccles & Wensing.[9] In this model, analyses of the target group and setting are essential defining the factors that influence change at different levels: the level of the patient, the individual professional, the health care team, the health care organization as well as the wider environment.[11] These influencing factors are important to ensure the success of the implementation, as they give information about how implementation strategies should be designed and what activities should be developed.[9,12]

Traditionally, implementation strategies are directed at individual professionals (individual level) or they address the structural work context (organizational level) in general and more specifically in nursing.[6] Implementation strategies addressing the social environment or context in nursing are seldom reported, but could indeed be of value. Evidence for the effectiveness of addressing social context exists in other settings.[13] The importance of the social context is also based on theories suggesting that knowledge diffusion is a communicative and interactive social process.[14,15] These theories underline the fact that the implementation of new ideas and technologies is largely influenced by

the structure of the social context. In health care for instance, strategies directed at good teamwork tackle problems associated with the fragmentation of care and generally improve the quality of both primary and hospital care.[16,17] Social context-directed strategies could include norm-setting, use of role models or team-directed strategies. To better understand the social context of nurses in the implementation of Evidence-Based Practice, we chose to investigate the role and influence of three key elements in the nurses' context: professional nurses' associations, nurse opinion leaders and nursing teams.

Professional Nurses' Associations

Professional nurses' associations are organizations representing nurses with the aim of promoting nursing quality, addressing workplace issues and lobbying for healthcare issues affecting nurses and the general public (ANA).[18] They provide education and training, promote research and represent their country in national bodies (for example Royal College of Nursing).[19] Professions such as nursing have succeeded in obtaining a monopoly of practice in their field of work, as well as a certain degree of autonomy in making decisions. We therefore assumed that professional nurses' associations are in a position to influence behavior with regard to the implementation of Evidence-Based Practice. In fact, they should not underestimate their role.[20] They are able to connect with practice environments, to influence external health care stakeholders (e.g. patient organizations, insurance companies), to build professional networks to represent the interests of nurses and the nursing profession, to lobby with government bodies and policymakers, to support and protect the value of nurses in all their diversity and they are able to contribute to the development of the nursing profession through disseminating relevant new insights.[20] However, a clear view on the contribution of nursing associations to the promotion of Evidence-Based Practice was not found in the literature. In this thesis one of our aims was to describe the roles and activities of professional nurses' associations in the promotion of Evidence-Based Practice.

Nurse opinion leader

A nurse opinion leader is described as a respected person within a health care organization, who understands an innovation and is motivated to make implementation a success.[21,22] Nurse opinion leaders are able to informally influence the attitudes or behaviors of other individuals in a desirable way. This informal leadership is not a function of a person's formal position or status in the system; informal leadership is earned and

maintained by the individual's technical competence and social accessibility.[14] Therefore, nurse opinion leaders are regarded as potential role models within the social network. They may act as facilitators, supporters and problem solvers in change processes. Nurse opinion leaders represent the social norms within the network and others trust them to compare innovations with the existing norms and demands of the local situation. Therefore, nurse opinion leaders can play a critical role in facilitating an innovation, up to the point where a critical number of members of a social network have implemented this innovation to such an extent that further adoption becomes self-sustained.[14]

Theories on social networks suggest that the behavior of individuals cannot be seen in isolation from the behavior of others, but should be considered in the social environment and networks in which they operate.[9,12,14,15] The assumption is that there is a continuous interaction between a professional, his or her performance and the social environment.[15] Moreover, the adoption of innovations is largely influenced by the structure of the social network as well as specific individuals in or at the margin of these networks.[23,14] Nurse opinion leaders are rather specific individuals, inasmuch as they are able to play a role in interventions that are aimed at improving compliance with desired practice.[22,24-26] However, we have no clear understanding of the competencies required and therefore need a better understanding of opinion leaders' approaches towards the implementation process and their personal and professional characteristics.[21,22,27] This understanding will help us to determine how to train opinion leaders, and develop a training program that can be replicated and improved. This will add to leadership training in clinical nursing and future research in the effectiveness of strategies in the implementation of Evidence-Based Practice. In this thesis we therefore explored the competences of opinion leaders in nursing, needed when promoting Evidence-Based Practice.

Nursing Teams

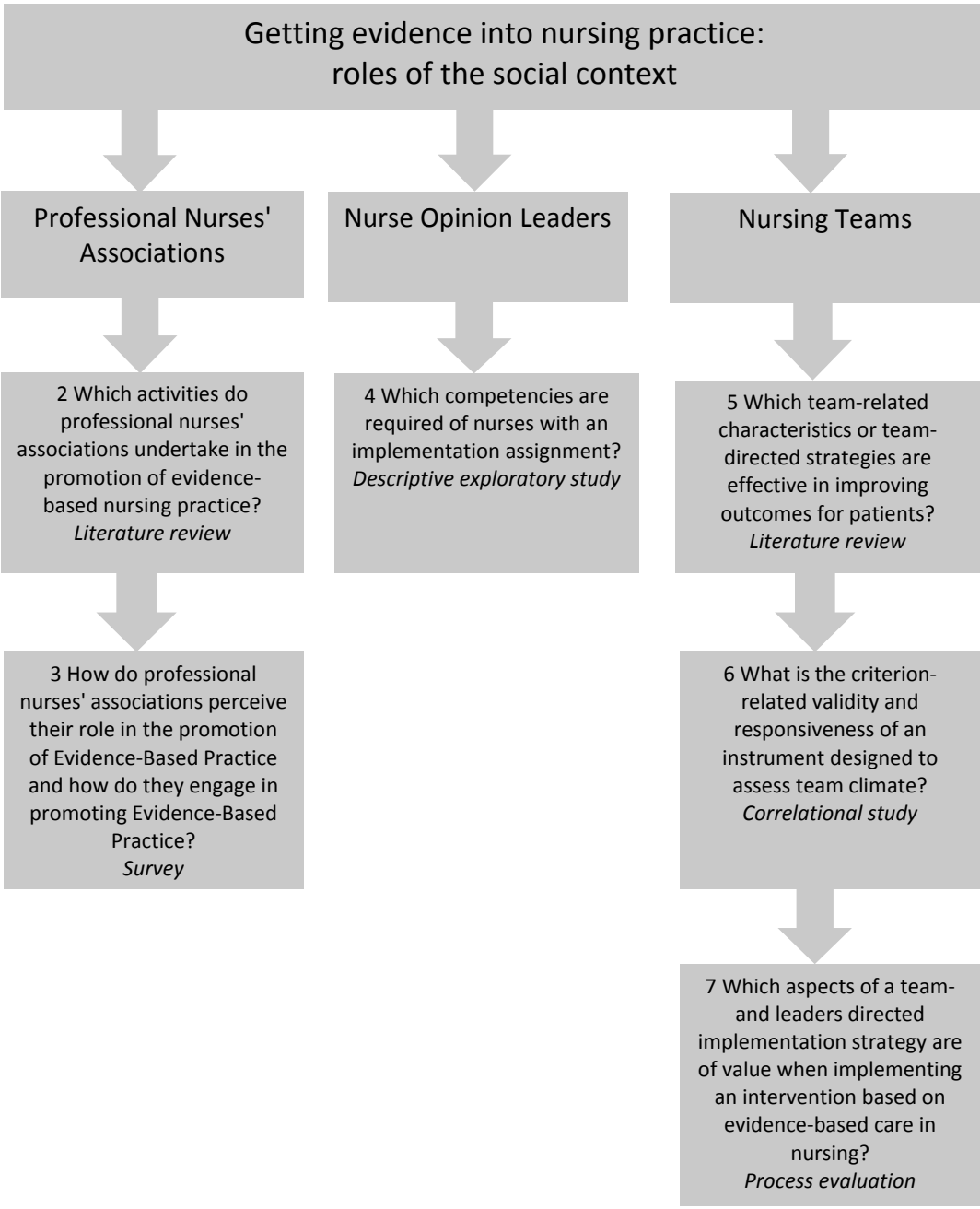
Teams are defined as two or more people working together on specific goals through interrelated activity.[28] Teams tend to be part of a larger organization and individual team members contribute specific knowledge, skills and abilities to the group.[29] For a team to be successful, members need to work together in a constructive and productive manner. Nurses most often work together to accomplish specific tasks and implement innovations, which requires the interdependent and collaborative efforts of all team members. Theories related to team effectiveness suggest that efforts to improve teamwork should be aimed at encouraging team collaboration[30,31] and that the team's cohesiveness is a predictor for effectiveness.[32-34] Therefore, many stakeholders regard teamwork as key to

the delivery of effective care. A recent document published by the Canadian Health Services Research Foundation stated: "A healthcare system that supports effective teamwork can improve the quality of patient care, enhance patient safety and reduce workload that causes burnout among healthcare professionals".[35] In general, when a team works 'well' it focuses on a range of key dimensions, including clear goals; shared team identity; shared commitment; clear team roles and responsibilities; interdependence between team members and integration of work practices.[36] However, we do not know if and how this applies for nursing teams in general, nor when implementing Evidence-Based Practice. More specifically, we need to know the characteristics of teamwork in nursing teams and how they can be measured and influenced. There is evidence that teams involved in quality improvement activities are more committed to implementing change.[37] Also, professionals who attach importance to the outcomes of quality improvement and who believe that they can achieve them are associated with higher perceived effectiveness at the team level.[38] This commitment to change and to improve quality are part of a good team climate and are described as significant predictors of perceived team effectiveness.[38] Given this, we assumed that in nursing teams a better team climate will result in improved quality of care. To assess team climate, we used the Team Climate Inventory (TCI) of Anderson & West.[39] The theory underlying its development suggests that effective team performance is associated with team activities characterized by four factors: vision, participative safety, task orientation and support for innovation. When we commenced our research for this thesis, no studies were reported in which team climate in nursing teams was either measured or related to the implementation of Evidence-Based Practice. For that reason, we decided to study the suitability of an instrument designed to assess team climate.

Aim of the thesis

The overall aim of this thesis is to explore roles of three elements of the social context of nurses in the implementation of Evidence-Based Practice: Professional nurses' associations, Nurse opinion leaders, and Nursing teams (see figure 1).

Figure 1 Overview of the studies of this thesis



Outline of the thesis

Chapter 2 describes a review of the activities of professional nurses' associations worldwide, when promoting Evidence-Based Practice. We searched several databases and included searches of additional sources like Google scholar as well as the sites of various members of the International Council of Nurses. In **Chapter 3** we investigated the self-perception of the roles and activities of professional nurses' associations in the Netherlands, in relation to the promotion of Evidence-Based Practice. We interviewed key informants of 43 professional nurses' associations and validated the findings from these interviews with an analysis of the associations' policy reports and other publications. **Chapter 4** describes the outcome of our exploration of the critical competences of nurse opinion leaders who facilitate the implementation of Evidence-Based Practice. In this descriptive exploratory study, we studied and supported aspiring nurse opinion leaders, using a self-developed training programme based on social influence and implementation theory. In **Chapter 5** the results of a literature review of relevant team characteristics and team-directed strategies in the implementation of nursing innovations are described.

In **Chapter 6** we described how we assessed the criterion-related validity and responsiveness of the Team Climate Inventory (TCI) in longitudinal research. In **Chapter 7** we described the results of a process evaluation to evaluate a team and leaders-directed strategy aimed at addressing barriers at team level, by focusing on social influence within teams and targeting the social context in which the implementation of interventions took place. Finally, in **Chapter 8** we discussed the findings, conclusions, and implications for practice and future research.

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Chapter 2

Promotion of evidence-based practice by professional nursing associations: literature review

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Journal of Advanced Nursing 2006;53(6):702-709.

Abstract

Aim This paper reports a literature review examining the activities of professional nursing associations in the promotion of evidence-based practice.

Background Professional nursing associations can play a role in the implementation and achievement of evidence-based practice as such associations aim to develop and further educate nurses professionally, build professional networks representing the interests of nurses and the nursing profession, influence the government and policymakers, and support and protect the basic values of nurses. The exact role of professional nursing associations in the promotion of evidence-based practice is as yet unclear, along with just how the role of such associations can be expanded and which strategies can be used to promote evidence-based practice among members.

Method A literature and Internet search was undertaken using the PUBMED, CINAHL, SCIRUS, INVERT, and the Cochrane databases using the terms evidence-based practice(s)* or EBP*, which were then combined with Nursing Society*, Nursing Organization*, Nursing Organisation*, Nursing Association* or Nursing Council*. Other sources included a Google search of the Internet, and the sites of various members of the International Council of Nurses. Publications in English, French or German from 1993 to 2004 were used, and the Internet search was conducted on 17 July 2003.

Results Sixty nursing associations described the dissemination of evidence-based practice using one or more types of activities (179 activities in total). All of these activities were of a voluntary nature, with a predominant focus (132/179 activities) on intrinsic motivation of nurses. More specifically, most of the activities were aimed at nurses' competences and attitudes in relation to evidence-based practice.

Conclusion Professional nurses' associations are active in promoting evidence-based practice among their nurse members, but only those focusing on changing competences and attitude by addressing intrinsic motivation are well used. Other types of activities deserve to be explored, including behavior-oriented approaches, approaches using structural, social or financial influence measures and perhaps methods based on 'involuntary involvement'.

Introduction

Nurses in clinical practice are increasingly being challenged by the expectations of patients, patient organizations and other healthcare organizations to provide clearly measurable care of the highest quality. In order to achieve this, evidence-based practice (EBP) is of key importance, and the nurse's role is to 'bridge the divide' between research and practice via improvement of clinical care on the basis of the evidence regarding best practice.[1] Several definitions of EBP are provided in the literature and can be seen to have a common core. EBP combines information about the results of well-designed research, clinical expertise, patient concerns, and patient preferences.[2-4] Mulhall[5] defines evidence-based nursing as the incorporation of evidence from research and clinical practice plus patient preferences into clinical decisions.

In actual practice, knowledge derived from scientific research is rarely used by nurses. Heater et al.'s[6] meta-analysis nevertheless shows patients receiving care based on research to have better health outcomes than those receiving care based on tradition. In other words, the implementation of EBP appears to be a problem and EBP is apparently not promoted enough. Professional nursing associations can presumably play a role here, as their aim is to develop and educate nurses professionally, build professional networks to represent the interests of nurses and the nursing profession, influence government bodies and policymakers, and promote the value of nurses in all their diversity.[7] However, the role of professional nursing associations in the promotion of EBP today, just how this role can be expanded, and just which strategies should be used by the members of such associations are as yet unclear. We, therefore, undertook a review of the interventions currently performed to stimulate the use of EBP by professional nursing associations as a first essential step in the promotion of the provision of quality patient care by nurses in the Netherlands and the rest of the world.

Aim

The aim of the review was to gain insight into the activities undertaken by professional nursing associations in the promotion of evidence-based nursing practice.

Search strategy

The PUBMED, CINAHL, SCIRUS, INVERT, and the Cochrane Database were searched using the following terms: evidence-based practice(s)* or EBP*, which were then combined with Nursing Society*, Nursing Organization*, Nursing Organisation*, Nursing Association* or Nursing Council*. The same terms and combinations of terms were then

used in a Google search of the Internet. The healthcare journals Evidence-based Nursing and Evidence-based Healthcare, the journals of the professional nursing associations, the references of all retrieved publications, and the information from various national and international conferences were also all searched as well as the sites of various members of the International Council of Nurses (ICN). Publications in English, French or German from 1993 to 2004 were used, and the Internet search was conducted on 17 July 2003.

Selection of studies

Two reviewers independently made an initial selection of abstracts and Internet sites using the following inclusion and exclusion criteria:

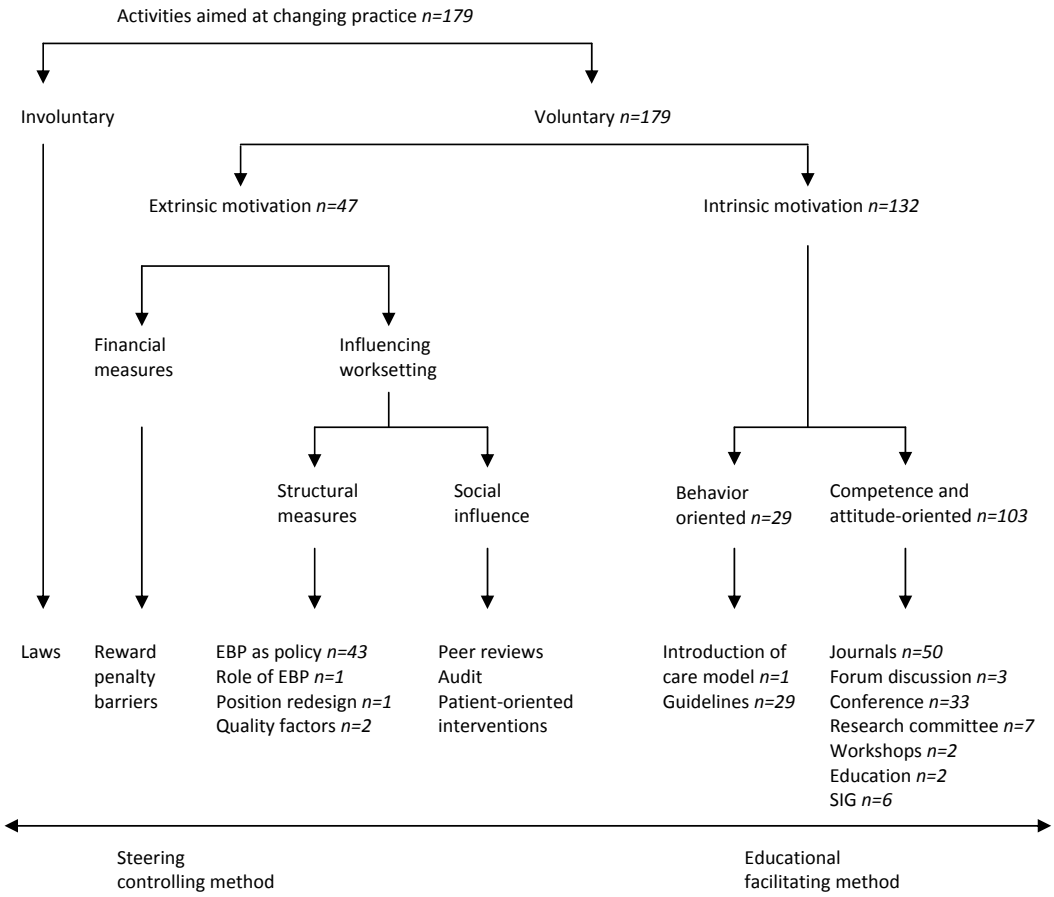
- *The source concerns an initiative on the part of a professional nursing organization*. Studies and papers involving professional nursing associations at a regional, national, or international level were included. Sources referring to the activities of nursing schools, research groups, or centers of nursing expertise were excluded. Publications describing EBP activities required by a nursing organization or the use of products developed by nursing associations were included.
- *The source focuses on EBP*. Studies and papers explicitly addressing evidence-based practice were included. This meant sources concerned with the incorporation of evidence-based nursing practice from research into clinical practice and patient preferences into clinical decisions.[5]
- *The source describes operational EBP activities*. Studies and papers containing descriptions of strategies to promote and support the implementation and use of EBP were included when specific activities were either described or actually performed.

Data analysis

The promotion of EBP by professional nursing associations can be considered a change activity, and there are different systems of classification for such change activities. In some cases, the main activity is considered.[8] In other cases, segments of the target group are considered.[9] Change activities can also be classified as facilitative or controlling.[10] The activities of associations are difficult to classify. In the present project, however, we were particularly interested in whether the activities of professional nursing associations were more facilitative or controlling with respect to the daily practice of nurses. A distinction was, therefore, made between largely educational and thus facilitative methods vs. mainly steering and thus control methods and between voluntary vs. involuntary methods.[10,11] These distinctions are in keeping with a framework based on the so-called

'participation implementation model' in which the demands of practice typically guide implementation.[10] This framework was used to organize the results of our review, is outlined in Figure 1, and is briefly described further below.

Figure 1 Activities aimed at changing practice (adapted from Van Woerkom 1990)



A distinction was made between voluntary and involuntary methods within the van Woerkom framework. Involuntary methods include the external compulsion and obligation associated with the imposition of regulations and the sanctions imposed upon no adherence with such regulations. Voluntary methods involve the extrinsic and intrinsic motivation of the target group. Intrinsic motivation implies efforts to increase expertise via individual or group education, instruction, information, and the provision of support and encouragement for the accomplishment of change. Intrinsic motivation may also involve the collection of data and provision of feedback aimed directly at daily practice,

reminders, or decision-making support. Extrinsic motivation may involve the provision of financial or material incentives for 'good behavior', organizational measures to promote the application of a new procedure, and/or the redesign of multidisciplinary care processes. Alternatively, extrinsic motivation may involve social pressure to change performance, input from an opinion leader, and/or simply informing patients about desired practice (Grol et al. in press). The underlying assumption is that different segments of the target group may respond to different measures, with some segments more responsive to facilitating interventions and/or supportive measures, while others need explicit external pressure.

Results

Summary of initial search results

When we started this search we found hundreds of nursing associations in different parts of the world highlighted (selection criterion 1). After limiting the search using the second and third selection criteria (explicitly addressing evidence-based practice; describing operational activities) the number of nursing associations was considerably reduced. As shown in table 1, the initial literature search resulted in 159 abstracts. The initial Google Internet search resulted in 123 Internet sites. The other searches (reference checking and hand searching) resulted in 40 additional sources.

Table 1 Summary of initial search results

	Literature search	Internet search	Additional searches	Total
Search term hits	159	123	40	322
After screening inclusion criteria	14	27	23	64
Associations identified	10	27	23	60
Activities identified	84	18	70	179

Two reviewers next inspected the 322 hits using the inclusion criteria. This resulted in a total of 64 relevant sources relating to a total of 60 different nursing associations for further analysis. More specifically, 14 published papers were found (see appendix 1), 27 Internet sites, and 23 sources in the additional search. The 14 published papers describing EBP activities were published in 10 different professional nursing association journals, with the following four professional nursing associations publishing two relevant EBP articles each: Oncology Nursing Society, Association of Nurses in Aids Care, American Association of Critical Care Nursing, and Nursing Council of New Zealand. Of the 27 professional nursing associations revealed by the Internet search, 18 were United

States of America (USA)-based, four were Canada-based, four were Australia-based, and one was New Zealand-based. The additional searches showed one professional nursing organization to be based in Switzerland, one in Finland, and the remaining 21 in the USA. The 60 associations in our search were found to undertake 179 EBP activities, ranging from the publication of EBP articles in journals and organizing EBP conferences or workgroups to direct involvement in EBP related research. Some nursing associations undertook one and others undertook more than one EBP activity. The United Kingdom Royal College of Nursing (RCN) and the Finnish Nursing Association (FNA) were found to undertake the greater number (eight) and widest variety of EBP activities.

Classification of EBP activities as voluntary or involuntary

All of the detected EBP activities (n=179) could be classified as voluntary methods which specifically focus on the extrinsic and intrinsic motivation of the target group. Within the group of voluntary activities, 132 were found to have a focus on intrinsic motivation and 47 had a focus on extrinsic motivation (see figure 1). Of the EBP activities with a focus on intrinsic motivation, 103 were oriented towards competence or attitude and 29 towards actual behavioral practice (tables 2 and 3).

Table 2 Summary of voluntary activities with a focus on intrinsic motivation, competence or attitude related to evidence-based practice (n=103)

Educational materials	Small group meetings			Large group meetings		
Journals	Forum Discussions	Small interest group	Research committee	Conference Symposium	Workshops	Education
27[1]	3[1]	4[1]	5[1]	12[1]	1[1]	1[1]
5[2]		2	2	21	1	1
18						

[1]Internet search; [2]literature search; [3]additional search

Table 3 Summary of voluntary activities with a focus on behavior related to evidence-based practice (n=29)

Guidelines	Introduction of care model
10[1]	1[2]
8[2]	
10[3]	

[1]Internet search; [2]literature search; [3]additional search

Some 27 articles from the Internet search (five papers from the literature search and 18 from the additional searches) described mainly the principles of EBP, those factors that appear to facilitate or obstruct evidence-based nursing practice, the attribution of EBP within the context of care decision support, and different steps and strategies for

implementation of evidence-based nursing practice. For example, 'Home Healthcare Nurse' gave an overview of how best evidence can assist with providing up-to-date clinical interventions. Various evidence reports and sources of reference for best evidence were outlined to improve clinical decision-making.[12] Professional nursing associations mostly used conferences and symposia to communicate EBP to their members.

Guidelines

Most of the articles, we examined described the development, implementation, and/or evaluation of evidence-based guidelines. Various structures, frameworks, models, and strategies were presented for the introduction of EBP into daily practice. In the Journal of the Association of Nurses in Aids Care,[14] for example, a model was presented for use by providers of healthcare to treat HIV-infected patients experiencing fatigue in a standardized manner and thereby assure best treatment. The model was developed by Rosswurm and Larrabee[15] and involves the following six steps: (1) assessment of the need for practice changes; (2) linking of problem interventions and outcomes; (3) synthesis of best evidence; (4) design of practice changes; (5) implementation and evaluation of practice changes; and (6) integration and maintenance of EBP changes. In a different article,[16] some key factors for the development, dissemination, and successful implementation of EBP guidelines were outlined. Among the key factors were: identification of the need for the guideline; adoption of a multidisciplinary approach to guideline development; gaining of institutional and management support for implementation of guidelines; consultation with teaching staff and patients; and a well-planned implementation strategy.

In only a few articles were nursing associations reported to play a more executive role within the process of developing, implementing, and evaluating EBP guidelines. In one paper in the Clinical Journal of Oncology Nursing, for example, the development and revision of an oncology oral care clinical practice guideline was described.[17] The guideline was developed by a multidisciplinary working group, implemented in only one hospital, and later evaluated for its impact on nursing and patient outcomes. Another rare example was an article published in the American Cancer Society Journal on the evaluation of an evidence-based smoking cessation guideline.[18] Members of the Oncology Nursing Society were the targets, and the research was funded by an Oncology Nursing Foundation, performed by members of a university, and presented at the annual meeting of the Oncology Nursing Society Nursing Foundation.

Introduction of a care model

The focus of a paper in the Oncology Nursing Forum, which is the official journal of the Oncology Nursing Society, was on the introduction of an integrated model of evidence-based nursing practice. Three nursing interventions were developed, implemented, and evaluated: care for central lines, competency-based chemotherapy administration, and development of research-based fatigue indicators.[19] Rogers' Diffusion of Innovations Theory[9] provided the broader framework for this study, along with the concept of mentoring adopted from Benner's (1984) Novice to Expert model.[20]

EBP as policy

A total of 42 EBP activities focused on the integration of EBP policy into professional nursing associations (table 4). On a number of the Internet sites and in the additional searches of various nursing associations, evidence-based nursing practice were described as part of current policy.

Table 4 Summary of voluntary activities with a focus on extrinsic motivation related to evidence-based practice (n=40)

Evidence-based practice as policy	Role of evidence based practice in nursing policy	Position Design	Identification of quality factors
22[1] 13[3]	1[2]	2[2]	2[2]

[1]internet search; [2]literature search; [3]additional search

Role of EBP in nursing policy

In one paper,[21] it was argued that nursing policy should be seen as a type of decision-making that requires sound evidence for the planning, implementation, and evaluation of relevant results. Nurse administrators further have the expertise to be influential in health policy because they know the right questions to ask, can supply the relevant data, and have knowledge of the perspective of the consumer.

Position redesign

Two publications in the Journal of the American Association of Critical Care Nurses (i.e. AACN Clinical Issues) highlighted the critical role of advanced practice nurses in championing the integration of evidence-based patient care. In one paper, the role of an advanced practice nurse and evidence-based practice in general were described.[22] In the other article, the role of an advanced practice nurse in the identification and implementation of practice that can reduce the rates of nosocomial infections were

described.[23] The American Nurses Association has targeted nosocomical infections and specifically bacteremias as outcomes that can be clearly influenced by nursing practice in acute care settings.[23]

Discussion

One possible limitation on the present review is that the publications of professional nursing associations may not provide a complete overview of all EBP activities within a certain time period. Our results from the Internet search support this suspicion, as it provided many additional sources. The combination of a systematic search of the literature, an Internet search, reference tracking and hand searching methods was, therefore, a optimal selection of methods for our purposes.

Our searches of the published literature and Internet showed that few professional nursing associations were involved in EBP activities. The activities of the professional nursing associations were examined worldwide, but mostly came from the USA, Australia, and Europe. We were somewhat restricted by language, i.e. nursing associations with no English, French or German references were excluded from further consideration. This could have introduced bias in relation to African, Asian and South American associations, although for some of these associations texts in these languages were found (and did not describe the promotion of evidence-based practice).

A further limitation is that we looked for sources which explicitly described the promotion of evidence-based practice. It is possible that we missed initiatives that actually support the use of evidence in practice, but were not overtly presented as such.

A strength of the current study lies in the systematic way it was performed. Not only were systematic searches carried out to limit the possibilities of bias, but inclusion decisions were performed by two independent reviewers. Furthermore, the results were not merely presented as frequencies, but also viewed in relation to a model of all possible types of activities. This model[10] proved to be useful in the presentation and interpretation of our results. Given the strengths and limitations of our study, it is likely that our review did not identify all activities nursing associations undertake in the promotion of evidence-based practice, as our search was restricted to initiatives deliberately presented as such and was also restricted in language. Rather, our search probably identified a selection of peer leaders among these associations from Australia, Europe and North America. Regarding the types of activities these associations undertake; however, we have no indications that our results were biased. The results for the types of activities were very clear, showing large differences in frequencies and even absence vs. presence of types of

activities. Moreover, if the types of activities that were least identified (such as involuntary, structural and financial measures) had been present, one would expect these to be very well documented.

When placed within the framework of van Woerkom, most of the activities related to the implementation of EBP were found to be of a voluntary nature with a focus on intrinsic motivation, competences and attitudes related to EBP. Professional nursing associations provide educational materials via journal articles, Internet sites, special interest group meetings, and conferences (i.e. small and large group meetings). Knowledge of EBP has improved as a result of such education efforts,[24] which shows education to be a feasible task for nursing associations. However, the actual effects of educational interventions for change purposes (i.e. as a change strategy) have generally been found to be quite limited.[11] Education is nevertheless a necessary part of the change process. Only in combination with additional measures and actions can lasting changes in nursing practice be obtained. Lack of knowledge or skills can be reduced via education, but other barriers to change, such as insufficient time or negative attitudes, are only addressed indirectly at most by education. Healthcare workers also acquire knowledge via many other channels than formal education or reading professional journals.

The question that then arises, however, is whether and just how nursing associations can stimulate more behavior-oriented activities related to EBP. A second question is whether or not professional nursing associations should consider use of EBP activities of a more involuntary nature and thus involving greater steering and control.

The development and dissemination of clinical guidelines to improve the quality of health care is a frequent activity internationally.[25] Although many guidelines are available, some are better adhered to in practice than others.[11] This difference may be caused by such factors as the type of health problem addressed, method of guideline development, actual content of the recommendations, source of dissemination, and format or layout of the guidelines and accompanying recommendations. As already noted, the role of most professional nursing associations with regard to EBP guidelines appears to be largely one of informing their members of the importance of the guidelines and providing structures for their development, implementation and evaluation.

Conclusion

A relatively small group of professional nursing associations in Europe, North America and Australia serves as peer leaders in the promotion of evidence-based practice among nurses. It is, thus, probable that many such associations from these parts of the world do

not as yet take an active role in the promotion of evidence-based nursing practice. Possibly, this is explained by the fact that these associations sometimes have very few paid employees and therefore largely depend on the activities of volunteers. Moreover, it is well-known that only a very small percentage of the members of professional nursing associations actively participate in them.

Our review gives a clear overview of the current activities of professional nursing associations in the promotion of evidence-based care practice. Most EBP activities performed by professional nursing associations were found to be competence- and attitude-oriented. This suggests that greater attention could be paid to the potential role of the associations in promoting evidence-based practice using more behavior-oriented activities with a more steering and control character. Where nursing associations currently approach evidence-based practice from a 'free of obligations' perspective, members could be targeted in a less non-committal manner in future initiatives. If a clear connection between association membership and a level of commitment and obligations could be established, this would offer new options for the promotion of evidence-based practice in order to achieve a stronger professional profile.

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Appendix 1. Evidence-based practice activities undertaken by professional nursing associations as evidenced by publications, Internetsites and results of additional searches

Association for Australian Rural Nurses (AARN) [a]
American Association of Colleges of Nurses [b]
American Association of Critical Care nurses [a,b]
American Association of Neuroscience Nurses (AANN) [a]
American Association of Occupational Health Nurses (AAOHN) [c]
Association of Nurses in Aids Care [b]
American Academy of Nurse Practitioners (AANP) [a]
American Association of Nurse Anesthetists [b]
American Association of Spinal Cord Injury Nurses (AASCIN) [c]
American Holistic Nurses Association (AHNA) [c]
American Medical and Surgical Nursing (AMSN) [b]
American Nephrology Nursing Association [a]
American Nurses Association (ANA) [a]
American Psychiatric Nurses Association (APNA) [c]
American Radiological Nurses Association (ARNA) [c]
American Society of Peri-Anesthesia Nurses (ASPAN) [a]
American Society of Plastic Surgical Nurses (ASPSN) [c]
Association of Nurses in Aids Care (ANAC) [a]
Association of Pediatric Oncology Nurses (APON) [c]
Association of Preoperative Registered Nurses (AORN) [a]
Association of Rehabilitation Nurses (ARN) [a]
Association of Women's Health, Obstetric, and Neonatal Nurses (AWHONN) [a]
Australian Nursing Federation (ANF) [a]
Canadian Gerontological Nursing Association (CGNAC) [a]
College of Nurses Aoteora [a]
Community Nursing Organization [b]
Council of Rural Area Nurses of Australia (CRANA)*
Dermatology Nursing Association (DNA) [c]
Emergency Nurses organization*
Finnish Nurses Association (FNA) [c]
Home Health Care Nurses [b]
Hospice and Palliative Nurses Association [b,c]
International Nurses Society on Addictions (INSA) [c]
Infusion Nurses Society (INS) [c]
International Association of Forensic Nurses (IAFN) [c]
Midwest Nursing Research Society (MNRS) [c]
National Association of neonatal Nurses (NANN) [c]
National Black Nurses Association (NBNA) [a]
National Gerontological Nursing Association (NGNA) [a]
New York State Nurses Association (NYSNA) [a]
New Zealand Nursing Organization (NZNO) [a]
Nursing Council of New Zealand [b]
Nursing Praxis in New Zealand [b]
Oncology Nursing Society [b]
Operating Nurses Association of Canada (ORNAC) [a]
Respiratory Nursing Society (RNS) [c]

Royal College of Nursing [a]
Royal College of Nursing Australia (RCNA) [a]
Sigma Theta Tau, Honor Society of Nursing (STTI, HSN) [a]
Society of Gastro-Enterology Nurses and Associates (SGNA) [a]
Society of Otorhinolaryngology and Head-Neck Nurses (SOHN) [c]
Society of Pediatric Nurses (SPN) [c]
Society of Trauma Nurses (STN) [c]
Society of Urology Nurses and Associates (SUNA) [c]
Society for Vascular Nursing (SVN) [c]
Schweizer Berufsverband der Krankenschwestern und Krankenpfleger (SBK) [c]
The Transcultural Nursing & Healthcare Association (TNHA) [c]
Wound, Ostomy, and Continence Nurses Society (WOCN) [a]

[a] internet sites; [b] publications; [c] additional search

Chapter 3

Promoting evidence-based practice: the roles and activities of professional nurses' associations

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Abstract

Aim This paper reports a study exploring the role perceptions and current activities in evidence-based practice promotion of professional nurses' associations in the Netherlands.

Background The promotion of evidence-based practice contributes to professional standards in nursing and good quality care for patients. As professional nurses' associations can be key players in this process, the nature of their roles and current activities deserves to be explored.

Methods Roles and activities were explored for 43 professional nurses' associations (83% of all national associations). Data were collected using interviews with the associations' board members. Findings from the interviews were validated with those from an analysis of the associations' policy reports and other publications in the previous 2 years.

Results Board members primarily thought that they had roles in the selection and distribution of evidence. The roles of participant (n=13) and performer (n=13) in selecting evidence, and those of facilitator (n=12), initiator (n=15) and performer (n=41) in the distribution of evidence were often addressed. A few respondents reflected on roles in generating evidence and implementing evidence-based practice in patient care. A majority of the associations was contemplating activities in the promotion of evidence-based practice. Specific activities for each of six relevant aspects in the promotion of evidence-based practice were found in fewer than five associations.

Conclusion Professional nurses' association roles in the promotion of evidence-based practice need to be viewed in relation to the tasks to be accomplished, especially those of selecting and distributing evidence. Although many organizations expressed motivation, professional nurses' associations have a long way to go in the promotion of evidence-based practice among their members.

Introduction

This paper reports a study exploring the contribution of professional nurses' associations to the promotion of evidence-based practice (EBP). As nurses around the world strive for recognition as professionals, the development and application of evidence in nursing is increasingly seen as vital to the nursing discipline. Furthermore, the use of evidence is clearly relevant from the perspectives of patients and clients, as they rightfully hope for care that optimally promotes their health and well-being. As a result, the relevance of EBP is broadly recognized in health care today.[1,2] Following the definition of evidence-based medicine, EBP can be defined as the conscientious, explicit and judicious use of current best evidence in making decisions about the care for individual patients.[3]

Background

Although early critics often described EBP as 'cookbook care' (and some healthcare professionals may even have used it in this way), these critics (e.g.) seemed to reflect on a caricature of what EBP stands for.[4-6] The intention of EBP is to integrate the best external evidence with individual clinical expertise and patients' preferences. Some authors proposed the use of 'evidence-informed nursing' to highlight the importance not only of evidence, but also environmental and patient characteristics in clinical decision-making.[7] The term 'evidence-based practice', however, remains dominant today.

Promotion of the use of evidence in care delivery is aimed at enhancing the quality of care and can contribute to transparency and informed choices. However, while the importance of EBP is hardly questioned, the path towards it is yet to be paved. Several authors have addressed the problematic implementation of EBP.[8,9] Issues that complicate its implementation are questions of what counts as 'evidence',[10] dealing with relevant contextual factors such as culture and leadership,[11] lack of evaluation of models that promote the implementation of evidence,[12] lack of clarity on meaningful health outcomes[13] or simply lack of means[9].

The use of evidence in practice is a shared responsibility of many stakeholders. Patients, professionals, researchers, healthcare managers, health insurance companies, health policymakers and public health inspectors have shared, as well as individual motives in the promotion of EBP. Among these stakeholders professionals have a central role, as only they are in the position actually to demonstrate the application of evidence in healthcare delivery. Therefore, professionals should adopt an active role in EBP promotion and cannot afford to wait for other stakeholders to demand transparent use of healthcare evidence.

However, knowledge is disseminated through many channels and healthcare professionals may lack awareness, be unable, or be insufficiently motivated to keep up with the large number of publications in their own areas of expertise. Many professionals depend on their professional peers, especially those with advanced academic skills, for up-to-date knowledge. This implies that professional peer associations could play a vital role, for instance in retrieving and summarizing evidence and communicating evidence to their members. Moreover, guarding and improving the quality of care as delivered by their members is important to any association of professionals. With regard to nursing care, associations of professional nurses have a vital role in this respect. Yet the role and activities of these organizations are not addressed in the international literature, and we could find no studies describing the part of professional nurses' associations in the well-accepted strive for evidence-based nursing.

The study

Aim

In the Netherlands, professional nurses' associations collaborate in a national assembly (AVVV: Dutch Association of Nurses and Care Workers). In preparing a policy to further promote EBP, the AVVV decided to investigate the state of the art amongst its member associations. The study was designed to answer two questions:

- How do professional nursing associations perceive their role in the promotion of EBP among their members and other nurses working within the associations' scope of professional practice?
- To what extent are professional nurses' associations currently engaged in the promotion of EBP?

Design

A cross-sectional, descriptive survey design was used. With a focus on the associations' role-perception (first study aim), key-informants for the associations were the logical choice of respondents for this study. As the second study aim focused on current engagement in the promotion of EBP, we chose to validate information from these key-informants using documents such as the associations' policy reports and official publications. Data for the study were collected in 2003 and 2004.

Participants

All professional associations that were members of the national assembly on 1 January 2004 (n=52) were invited to participate in the study. A total of 43 associations (83%) participated. The nine associations that did not participate refused because they were facing reorganizations or in the process of appointing new board members (n=7), or because they thought the focus of their organization – not on practice content – implied that promoting EBP would not be an obvious policy (n=2).

Many of the professional associations (n=19) had a medical specialty orientation (e.g. dermatological nursing, cardiovascular nursing and cancer nursing). Thirteen were organized with a focus on the setting of healthcare delivery (e.g. community nurses, nurses in occupational health care services and nurses in prison systems). A specific orientation or interest area among members characterized six associations (e.g. Reformed Christian nurses and nurses oriented towards intercultural care). Finally, another six had a generic focus (e.g. nurse educators, nurse scientists and general nurses' trade union), two of which were trade union-based.

Data collection

The data collection consisted of interviews with association board members and an analysis of documents that were expected to formalize or illustrate the associations' EBP promotion activities.

Association board members were asked to choose their own representative for the interview. As a rule, one member per association was interviewed. In practice, these members were either the chair of the association board or a member with a special appointment for 'evidence' or 'science'. Interviews with the board members used a prestructured set of questions to which open answers were to be given. Both research questions were addressed in the interviews. At the start of the interviews, respondents were invited to describe the association's goals, structure and other main characteristics. Given this frame of reference, they were then asked to describe its role in the promotion of EBP. In subsequent questions, the interviewers (GH and MvdV) asked for more detail in order to obtain a clear description of the role perception.

Relevant topics with regard to the second research question (current engagement in promoting EBP) were derived from preparatory interviews with 10 selected experts. These persons had expertise in knowledge dissemination and implementation (n=3), transferring knowledge through education (n=3), generating and accessing knowledge management in expertise centers (n=3), and judging quality of care and use of evidence

using site visits (n=1). Half of the experts represented nursing, while the other half represented other healthcare disciplines. The preparatory interviews with experts resulted in a list of six topics for the interviews with the nurses' associations board members. These topics and their definitions, as derived from the preparatory interviews, are given in table 1. The associations' knowledge, perspectives and motivation with regard to EBP were identified as topics relevant to the associations' outlook on EBP. Their policies, impact on curricula and (structures for) communication were identified as the most relevant topics in the operationalization of promoting EBP. These six topics were addressed in all interviews with nurses' association board members.

Validity

In addition to the interviews, the associations' policy reports and publications during the last 2 years were analyzed. Relevant documents were retrieved through the board members who gave the interviews and through the associations' websites. The publications and reports were read and analyzed using the same shortlist of six topics. The results of this analysis were used to validate or complete the interview findings. If, for instance, the board member explained the EBP policy of the association, the analysis of the association's reports or publications was used to check for formal policy statements and for plans or activities resulting from this policy.

The data collection was carried out by two of the authors (GH and MvdV). Two interviews were attended by both interviewers to ascertain that similar strategies were being used. Appointments for the interviews were planned by telephone, and written information on the interview purpose was sent in advance. Interviews were undertaken in a face-to-face setting and were tape-recorded and transcribed.

Ethical considerations

The study did not include patients or patient data and did not intervene in actual patient care. Therefore, approval of a certified healthcare ethics committee was not needed.

Data analysis

First, content analysis of the interview texts was carried out to obtain descriptions of the major role perceptions for the nurses' associations. For this purpose, categories for role descriptions were derived from the interviews. Then all role descriptions were classified according to these categories, thus enabling quantitative presentation of the major findings.

Secondly, the associations' 'stage of EBP promotion' was summarized for each of the six EBP promotion topics (table 1). For the latter purpose, a short classification of the associations' EBP promotion status was based on the stages of change construct. This construct, or a very similar conceptualization, is used in several theories that address individual or organizational change.[14-19]

Table 1 Topics for interviews with nurses' association board members

Topics relevant to the promotion of evidence-based practice	Definition
1. Knowledge	The association's board and members' knowledge of the concept of EBP and the practical implications of promoting EBP.
2. Perspective	The extent to which EBP is perceived as important to professional development, the influence of nurses as a group and the improvement of patient care.
3. Motivation	Willingness to promote EBP in relation to perceived benefits and perceived support within the association and with other relevant parties.
4. Policy	The relative absence or presence of EBP in the association's policy at both global and operational levels.
5. Curricula impact	The level of influence on the content and level of curricula and courses within the association's professional practice scope.
6. Communication	Building distribution networks and structures, planning and performing with regard to the communication of EBP among the association's members.

In line with the descriptions of 'stages of change' in the literature, we defined a number of categories to capture the associations' EBP-promotion status:

- precontemplation: no intention to deliberately promote EBP;
- contemplation: orientation on EBP, thinking about changing the policy towards EBP;
- preparation for action: EBP adopted as a policy, preparing and planning specific action to promote EBP;
- action/implementation: performing the first operational activities to promote EBP;
- maintenance: performing operational activities over longer periods of time or taking things further by evaluating and adapting activities or seeking new partners in the promotion of EBP.

The analysis was performed by two of the authors (GH and MvdV). Six interviews were analyzed by both authors and gave similar results for both authors. The validity of analytical process was further checked by two of the other authors (TvA and MvV), who checked for valid classifications in a sample of the interviews. Again, the validity of the process was satisfactory.

Results

Role perceptions

Content analysis for role descriptions showed that associations' board members talked about five types of roles in the promotion of EBP (table 2). The roles of stimulator, facilitator, initiator, participant and performer were described. Those who addressed the role of stimulator, described how the association was often approached as a stakeholder in innovative projects and health policy initiatives. They believed that being seen as stakeholders by governmental organizations or professional associations from other healthcare disciplines enabled them to stimulate EBP and other issues on the association's agenda. Furthermore, they saw their professional organization as a stimulator of innovations among its members.

Table 2 Role perceptions of nurses association board members (n=43)

Role descriptions	Tasks			
	Generating evidence	Selecting evidence	Distributing evidence	Implementing evidence-based practice
Stimulator	1	6	2	-
Facilitator	-	1	12	3
Initiator	4	3	15	-
Participant	6	13	10	1
Performer	9	13	41	9

Those who mentioned a role as facilitator saw the professional organizations as a vehicle for creating opportunities, and stressed that the organizations could provide some of the means (material and manpower) for EBP promotion initiatives.

The role of initiator was the third role that board members described and was presented in a less non-committal manner. Respondents who described this role believed that promoting EBP was a core task and responsibility for professional nursing organizations, and that stimulating, participating and enabling EBP would not suffice. Instead, they believed that EBP promotion should be initiated by the organizations themselves, as they saw them as representing nurses' professional orientation.

The role of participant was often mentioned in combination with one or more of the other roles. This role was most often described as providing experts for the EBP initiatives of other organizations, such as medical or governmental organizations.

Finally, the role of performer was described in terms of operational action. Board members who addressed this role described how the organization should not only discuss and plan EBP promotion, but should actually carry out some of the initiatives themselves.

In describing associations' roles, board members often mentioned general tasks that needed to be carried out in the promotion of EBP. According to the respondents, their roles could only be understood in relation to these tasks, as their roles could vary for the different tasks to be accomplished. The tasks that were mentioned referred to different stages of knowledge development and distribution. Based on respondents' descriptions, we identified four different tasks: generating evidence, selecting evidence, distributing evidence and implementing EBP. Table 2 presents the results of the classification of associations' tasks when related to each of the roles.

Relatively, a few associations claimed roles in relation to generating evidence and implementing EBP. Generating evidence was often seen as a task for research institutes, whereas implementing EBP was described as a task for individual professionals and healthcare organizations. Selecting and distributing evidence, however, were more commonly seen as important tasks for professional nurses' associations.

The active role of 'performer' was relatively often addressed for each of the four tasks. Nearly all organizations (n=41) thought that they themselves should distribute relevant evidence to their members. Less agreement was found for all other combinations of roles and tasks, with around one-third of organizations also describing the roles of facilitator and initiator in the distribution of knowledge and the roles of participant and performer in the selection of evidence.

Current engagement in EBP promotion

The results for the current EBP promotion status of the 43 professional nurses' associations are presented in Table 3. A large majority of the organizations was not actively engaged in this, but were classified in the preparatory precontemplation and contemplation phases that precede active involvement.

Regarding perspective, policy and curricula impact, most organizations could be classified in precontemplation stage (n=22, n=22 and n=31, respectively). This implies that most had no clear perspective on the importance of EBP promotion and had not decided on an EBP promotion policy. Premature status was especially found for the 'curricula impact' aspect. More than two-thirds of the organizations were not actively involved in curricula within their areas of expertise, and often had no insight into the use of evidence and the promotion of EBP in these curricula.

Although 14 associations were classified as precontemplating with regard to the aspect of communication, contemplation was the most common stage (n=19) for this aspect. Associations that were classified as contemplating for this aspect often communicated on

EBP promotion at board level, without taking the next step of preparatory actions. These preparatory actions could include building operational communication structures that had the potential of EBP to serve as a tool for promotion, and were found in six organizations.

With regard to knowledge and motivation, the stages of precontemplation, contemplation and preparation for action were often found, although more favorable scores were found for motivation. Regarding knowledge, 18 associations stated that their lack of knowledge prevented them from choosing a perspective and defining a policy on the promotion of EBP among their members. With motivation, on the contrary, most of the organizations were classified as contemplators. Motivation was found among board members, but the motivation of association members was questionable or unknown to the board members.

Table 3 Evidence-based practice (EBP) promotion status of the professional nurses' associations(n=43)

Relevant aspects	EBP promotion status				
	Pre contemplation	Contemplation	Preparation for action	Action/ implementation	Maintenance
1. Knowledge	18	13	10	2	--
2. Perspective	22	14	3	3	--
3. Motivation	10	22	8	3	--
4. Policy	22	12	6	3	--
5. Curricular impact	31	7	1	4	--
6. Communication	14	19	6	3	1

Discussion

Some limitations as well as some strengths arise from the study design. The core informants were association board members, who were assumed to have access to all relevant information within the association. Regarding role perceptions, however, board members did not necessarily reflect the exact role perception of association members. During the interviews, some board members commented on this and stated that they were unsure of how well the board's ideas reflected those of members. If bias was introduced by interviewing board members, the findings for role perceptions were probably somewhat exaggerated, as the interviewers perceived that board members sometimes gave the impression of being 'ahead' of their peers. On the other hand, board members were deliberately chosen as respondents as they were the main policy developers for the associations and were in the best position to reflect on the associations' roles in the promotion of EBP.

With regard to the findings for current EBP promotion status, board members were not the only informants. Results from the interviews were validated using the associations' policy reports and other publications.

We aimed at exploring the role perceptions and current EBP promotion status of professional nurses' associations and the study is unique in this respect, as similar studies were not identified in the international literature.

Over 80% of the nursing professional associations in the Netherlands participated in the study, thus allowing for valid conclusions at a national level. The findings, therefore, represent the status quo in a relatively small (slightly over 16,000,000 inhabitants), Western-European country, but do not necessarily apply to other countries. Although professional nurses' associations in the Netherlands appear at least as active as those in most other countries, a thorough comparison of activities was beyond the scope of this study, and similar results for other countries cannot automatically be assumed.

Professional nurses' organizations believed they had roles to play in the distribution of evidence and – to a somewhat lesser extent – in selecting relevant evidence for their members. Next to all associations also claimed an active role (performer) in the distribution of evidence. Other roles often perceived were those of facilitator, initiator and participant in the distribution of evidence, and participant and performer in the selection of evidence.

Relatively few organizations believed that they had a role in generating and implementing evidence. Most seemed to believe that they themselves could not perform scientific research, whereas the actual implementation of evidence was perceived as beyond the control of the organization as it takes place in patient day-to-day care.

The findings for role perception imply that many of the organizations only partially saw a role for themselves in promoting EBP and/or had not given this much thought. This conclusion is supported by the results for the second research question on the actual EBP promotion status of the organizations. Most organizations were still contemplating or even precontemplating the development of an EBP promotion policy. Moreover, the contemplation and precontemplation stages were the dominant typifications for the EBP promotion status of the organizations in all the aspects studied. An orientation towards promoting EBP through relevant curricula within their scope of practice was lacking for most organizations. These findings suggest that professional nurses' organizations still have a long way to go when it comes to promoting the integration of evidence in care delivered by their members and peers. On the positive side, a relatively large number of organizations seemed aware of this and expressed being motivated to travel this road.

Conclusion

The question of how to proceed from the situation of a rather premature EBP promotion status for most of the nurses' organizations is both important and difficult. The promotion of EBP receives increasing attention in publications, and it could be assumed that nurses' organizations were still catching up with this development and that progress will be made in the coming years. In the Netherlands, the national assembly of professional nurses' organizations (AVVV) intends to stimulate this development by adopting a policy on the development and certification of good quality guidelines for nursing. This development is further supported by a grant programme from the national health research funding institute (ZonMw) for nursing guideline development proposals. The AVVV could further coach board members of its member associations in developing an EBP promotion policy, as well as an operational programme of activities.

In addition, co-operation of organizations could contribute to EBP promotion. Both between different nurses' organizations and between specialized nurses' organizations and their medical counterparts, options for collaborative EBP promotion activities are not always recognized. Furthermore, collaborative projects with patient organizations, and the national health inspection and research institutes could increase the level of activities. As not all organizations have sufficient research expertise available, co-operation with research groups could help to overcome EBP promotion barriers. In this way, 'involvement in generating evidence' could be a future role, where it is hardly perceived as a relevant role for the organizations today.

Finally, the transfer from policy and activities within the organization to everyday care-giving is not perceived as a prominent role for the organizations and was seen as hard to accomplish. Collaborative programmes with appropriate leading healthcare organizations seem necessary in this respect. When both organized professional peers and the management at the workplace stimulate the introduction of evidence in patient care, the chances of achieving evidence-based patient care seem optimal.

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Chapter 4

Empowering nurses to handle the guideline implementation process: identification of implementation competencies

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Abstract

Employing nurses as opinion leaders to implement guidelines may be a promising implementation activity. Until now, insight into necessary competencies of nurse opinion leaders is lacking. We studied and supported aspiring nurse opinion leaders, using a training programme based on social influence and implementation theory. Twenty-one competencies were identified, of which the most important were cooperating, communicating, delegating, giving feedback, networking, and information processing. Understanding and addressing these competencies may support the implementation of evidence-based guidelines.

Introduction

To improve quality of care and patient safety, the gap between scientific evidence and the practice of patient care needs to be bridged. For this, nurses need activities that promote evidence uptake. These activities can focus on nurses' intrinsic or extrinsic motivation.[1,2] The more frequently used activities focus on intrinsic motivation. Examples are education, monitoring, feedback, and the use of reminders.[3] Examples of activities focusing on extrinsic motivation are the use of opinion leaders, leadership, and team-directed interventions. The use of opinion leaders can be a promising implementation activity.[2,4,5] However, insight into the development and application of opinion leaders as an implementation activity is scarce. This research provides insight into the competencies required of nurses with an assignment to implement evidence-based guidelines within their organization.

Background

The underlying assumption of using opinion leaders to accomplish evidence-based practice is that interpersonal contact is a key factor in influencing behavior to improve the use of evidence in practice.[2,6] This assumption is based on theories that propose that knowledge diffusion is a communicative and an interactive social process.[7,8] These theories underline how the implementation of new ideas and technologies is influenced largely by the structure of the social network and specific individuals within these networks.[4,9,10] However, specific competencies of opinion leaders that influence the implementation process of guidelines are unknown.

In nursing, opinion leaders are respected and influential professionals within the organization with the ability to facilitate change in daily patient care. Different labels are used to describe these nurses, such as opinion leaders, facilitators, champions, linking agents, and change agents. However, all labels appear to be based on the premise that interpersonal contact improves the likelihood of behavioral change when introducing new innovations or evidence-based practice within the health sector.[6] These nurses are innovative and able to informally influence the attitudes or behavior of other individuals in a desirable way. Their informal leadership is not a function of the formal position or status in the system; the informal leadership is earned and maintained by the individual's technical competency and social accessibility.[2,5]

We know that opinion leaders appear to be monomorphic,[5,11] which means that their influence is limited to a specific topic, and different leaders are needed for different issues. We also know that their approaches toward the implementation process differ.[12]

Aim

Because the use of opinion leaders in nursing can be a promising and effective activity in the implementation of evidence-based guidelines,[13,14] we explored the necessary competencies of these professionals. The main aim of this study was to identify competencies of nurses with an assignment to implement evidence-based guidelines within their organization, using a training programme based on social influence and implementation theory.

Methods

Design and study population

A descriptive, exploratory study was conducted using mixed methods. A sample of 10 nurses was recruited for a training program by advertising in Dutch nursing journals and via Web sites of the Dutch Nursing Association (V&VN) and the Netherlands Centre of Excellence in Nursing. Criteria for recruitment were as follows: domain-specific professional expertise; an assignment to implement an evidence-based nursing guideline within their organization; support and written consent from their managers to participate in the programme; willingness to learn to be an opinion leader and share knowledge and experiences;[12] and commitment to the requirements of the training program.

The guidelines that had to be implemented by these nurses were management of intertrigo,[15] a rash or a bacterial, fungal, or viral infection on the skin, management of oral mucositis in oncology patients,[16] and management of nausea and vomiting in oncology patients in the palliative phase.[17] The guidelines were all certified by the Dutch Nursing Association. Each nurse had to implement 1 guideline in his or her organization.

Training programme

A 1-year training programme called Implementation Coach Program was executed. The purpose of the training programme was to provide support to the aspiring opinion leaders and obtain insight into the competencies required of nurses in the role of an opinion leader. This training programme was piloted in earlier quality improvement projects and adjusted.[18]

We used the Implementation model of Grol et al.[2] to guide the training on implementation processes. This model is based on critical elements for successful implementation that recurred in several models and theories (Table 1). This model puts forward a clear, stepwise approach to implementation, integrating 2 perspectives: (1) that of the implementer, the person, group, or organization who wants to plan and conduct

the change and needs to follow specific consecutive steps to be successful, and (2) the professional team or target group who needs to go through a process of change and needs to take different (consecutive) steps to arrive at integrating new performance within fixed routines.

Table 1 Elements of effective implementation described in literature

Elements
• A systematic approach to and good planning of implementation activities are needed most of the time
• Focus on the innovation: is it a good product?
• Subgroups within the target group may be at different stages of the change process and have different needs; segmentation within the target group should be allowed for
• Diagnostic analysis of the target group and setting should take place before the start of the implementation
• The target group should be involved in the development and adaptation of the innovation, as well as in planning the implementation
• The choice of implementation activities should link with the result of the diagnostic analysis
• Usually, a single method or measure is insufficient
• Make a distinction between the phases of implementation (dissemination, implementation and integration)—different measures and strategies are effective at different stages
• Take the appropriate measures for each of the various levels: national, local, team, practice and professional
• Continuous evaluation of both the implementation process and its results is required
• Make implementation an integral part of the existing structures

The steps of the Implementation model were translated into key elements (themes) of the training programme. The programme consisted of 8 interactive sessions of 7 hours each (table 2). The sessions were led by 2 experienced trainers.

Different teaching methods (group and individual coaching), Community of Practices, and instruments, including a Web-based discussion group, quality indicators, and a questionnaire, were used. Coaching was used to instill motivation, improve performance, and enhance self-management behavior.[19-21] The nurses received individual coaching twice weekly by telephone and e-mail from one of the trainers. Group coaching took place during the training days (the trainers reflected on the implementation processes and personal effectiveness of the participants). During the training programme, the participants developed and applied performance quality indicators to monitor the use of guidelines and to create awareness of outcomes on different aspects of quality of care as defined by the guideline. Furthermore, they developed a questionnaire to inventory factors that might influence the implementation process, define a diagnostic analysis, and link implementation activities.[22]

Table 2 Training programme

Implementation steps	Key Elements of the Training Program	Content of Training Days (n=8)
Description of identified problems, good experiences, best practices and guidelines Planning of the process: description of a clear aim, the team and target group involved, the budget and time schedule	Project management	***Day 1*** Introduction Explanation of implementation plan Workshop: self-assessment and competencies Group coaching: innovations to be implemented
Development of a concrete proposal and description of specific change targets	Indicators	***Day 2*** Lecture: designing and measuring with indicators Workshop: professional and personal goals Group coaching: coaching skills
Analysis of the current performance, target team, setting and other environmental factors	Context analyses	***Day 3*** Lecture: performing context analyses Workshop: interviewing skills Group coaching: feedback skills
Development and selection of implementation activities	Communication Implementation activities	***Day 4*** Lecture: communication in the implementation process Workshop: 'How do I design a communication plan?' Group coaching: 'The opinion leader in the role of communicator' ***Day 5*** Lecture: implementation activities Workshop: leadership competencies Group coaching: 'The opinion leader in the role of change agent'
Development, testing, and execution of implementation plan Continuous evaluation and adaptation of the plan	Change management Evaluation Presentation	***Day 6*** Lecture: change management Workshop: evaluating the implementation process Group coaching: team coaching ***Day 7*** Workshop: measuring indicators Workshop: presentation skills Group coaching: 'Personal branding' ***Day 8*** Presentation implementation results Evaluation personal and professional development skills

The concept of Community of Practices was applied[23] to nurture new knowledge, stimulate innovation, and share existing tacit knowledge within the group of participants. This concept refers to the process of social learning that occurs when people with common goals share knowledge and practices. One facilitator and 2 observers participated together with 10 participants. The facilitator created a safe and trusting

environment while explaining the purpose and giving a clear action plan along with activities to meet their needs. Participants shared tips and best practices, asked questions, and provided support to each other while knowledge was built and exchanged. The participants joined a Webbased discussion group to further stimulate the exchange of experiences and knowledge.

Data collection

Several methods were used to identify specific competencies required to operate as a nurse opinion leader with an implementation assignment: (1) Literature was reviewed.[2,20] (2) Nurses were asked to record competencies in a diary. They kept a monthly log to describe progress, evaluate the result of planned activities, lessons learned, and competencies used. (3) Audiotapes of the Community of Practices were made; (4) A feedback assessment tool was applied at baseline using a questionnaire derived from the 360º Leadership Practice Inventory assessment tool.[20] This 360º feedback assessment brings together the views of colleagues on the required competencies as a nurse opinion leader. Each of the 10 participants used a convenience sample of 5 colleagues at the workplace (not participants in the programme) to fill out the questionnaire. The questionnaire asked about the current competencies of the participant: Which effective competencies are present? and Which competencies need to be developed and applied? and (5) Managers were interviewed once by telephone after the training and were asked to define the most important competencies. 'Important' was defined as strongly affecting the success of the role of an opinion leader.

Data analysis

Conventional content analysis (coding categories directly from the text data)[24] was applied to identify common themes of the participants related to the competencies from the written diaries, the sound recordings of the Community of Practices, and self-assessments. Two researchers (GH and MvT) coded, counted, and compared the selected key words, and disagreements were discussed. Prioritizing of the competencies took place during a focus group meeting; all 10 participants were asked to select the 6 most important competencies. In addition, the managers of the participants were asked, during the telephone interview, to indicate the 6 most important competencies.

Results

Eight of 10 participants finished the 1-year programme. One participant had to quit because of personal reasons, and 1 participant changed jobs. The average age of the 8 participants was 42 years (SD=13); the average work years at the location of the study were 3.1 (SD=2.49). Although the settings varied, all participating settings shared a philosophy of care providing optimal care for patients based on evidence-based practice. Four nurses implemented the intertrigo[15] guideline. All 4 worked as registered nurses with advanced clinical skills in the area of wound and pressure ulcer care in 4 different settings; 1 nurse worked in a nursing home, 1 nurse in home care, and 2 nurses in a general hospital. The guideline management of oral mucositis in oncology patients[16] was implemented in a university hospital by 1 advanced nurse practitioner and in 2 general hospitals by 2 registered nurses with advanced skills in oncology care. The guideline management of nausea and vomiting in oncology patients in the palliative phase[17] was implemented in a general hospital by 1 nurse with advanced skills in oncology care. All participants perceived the personal coaching and attention to personal growth as supportive with an additional educational value.

Competencies

A total of 21 different competencies were identified (table 3). The 6 most important competencies according to participants were being competent in the area of delegating, information processing, cooperating, communicating, giving feedback, and networking. Different competencies were ranked as important by the managers compared with the participants. The 6most important competencies according to managers were being competent in delegating, information processing, persuading, presenting, project management, and bedside teaching. Delegating and information processing were mentioned as important by the participants as well as by the managers.

Most competencies were found in the written diaries (n=16). Being competent in the area of cooperating was described in 4 different data collection methods (literature, written diaries, audiotapes, and feedback assessment). Being competent in the area of communicating was found in 3 different data collection methods (written diaries, audiotapes, and feedback assessment).

Most of the identified competencies can be related to leadership, and some are related to research such as information processing, analyzing, interviewing, and oral-written language. A few competencies relate to the practical content such as project management and bedside teaching.

Table 3 Identified competencies of nurse opinion leaders

Being competent in the area of:	Literature	Written Diaries	Audiotaped CoP	Feedback Assessment	Important to Managers	Important to Participants
Delegating		*	*		*	*
Information processing			*	*	*	*
Cooperating	*	*	*	*		*
Communicating		*	*	*		*
Giving Feedback		*	*			*
Networking		*	*			*
Persuading		*	*		*	
Presenting		*			*	
Project management		*			*	
Bedside teaching				*	*	
Listening		*	*			
Coaching			*	*		
Lobbying		*	*			
Enterprising	*	*				
Motivating	*		*			
Learning	*			*		
Oral-written language	*	*				
Analyzing		*		*		
Interviewing		*				
Being Flexible		*				
Creative		*				

CoP (Community of Practices)

Discussion

The 21 different competencies identified in this study emphasize the complexity of the role of a nurse opinion leader with an implementation assignment within the organization. It is a challenging and multifaceted role demanding leadership-related competencies.

The reinforcement of these competencies may benefit from special training allowing this role to be properly executed. In particular, the systematic, programmatic, and stepwise approach as part of the Implementation model of Grol et al.,[2] personal coaching, and attention to personal growth were perceived as supportive with an additional educational value.

It is noteworthy that participants and managers ranked the competencies differently. Participants ranked competencies that are affiliated with leadership (cooperation, communication, delegating, feedback, and networking). Managers ranked competencies concerning policy and daily practice (project management and bedside teaching). This suggests that managers and nurses need to be aware of the complexity of the role of a nurse with an implementation assignment. In addition, nurses should be aware of the expectations of the managers concerning policy and daily practice-based competencies.

Identification of a common purpose and outcome concerning the implementation of the intervention by both managers and nurses at the start of the project could eliminate these discrepancies. This would enable the nurse to execute the expected role as an opinion leader.

Currently, the implementation of evidence-based practice in nursing relies mainly on strategies based on the intrinsic motivation rather than alternative strategies focusing on extrinsic motivation.[3,9] We focused on the method of expert influence, as research indicates that nursing behavior is influenced mainly by professionals with clinical expertise and in professional interaction.[14] Our results also support the findings described by Doumit et al.,[12] who identified how opinion leaders enjoy sharing their knowledge and up-to-date expertise with colleagues.

Being a nurse with an implementation assignment within the organization is a challenging and multifaceted role and can be overwhelming to a single individual, particularly those new to the role, who have no managerial support, or who are not trained. Yet, all 8 participants of this study are still involved in implementation assignments as an opinion leader or coach colleagues in becoming opinion leaders.

Many nurse opinion leaders are needed, as each innovation needs its own opinion leader.[11] Empowering nurse opinion leaders by improving their personal effectiveness and implementations skills was found to be of key importance for executing the expected role. Our results on competencies of nurse opinion leaders can be the first step toward a more formal profile. This profile can be applied in the selection or further development of nurse opinion leaders.

Our study was a small-scale exploratory project. We aggregated the competencies of individual cases, and firm conclusions cannot be made. However, the use of multiple data collection methods (triangulation) in this study provided an internally consistent picture of competencies considered important for nurses in this implementation role.

As for future research direction, more comparative and controlled designs to identify factors that may contribute to the effectiveness of nurse opinion leaders will contribute to the use of implementation activities with a focus on the extrinsic motivation. In this study, we asked the nurses and team leaders to identify competencies that facilitate the opinion leaders to implement guidelines. To that extent the subjective perception of success was related to the identified competencies. We did not objectively measure the relation between competencies of opinion leaders and successful implementation. That would be an interesting follow-up study.

Conclusion

Operating as an opinion leader to implement guidelines in nursing is a challenging and multifaceted role demanding a wide range of competencies. Most necessary in the view of nurses and managers is being competent in delegating, information processing, cooperating, communicating, delegating, giving feedback, networking, and information processing. The benefit from a special training allows this function to be properly executed.

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Chapter 5

The relevance of team characteristics and team directed strategies in the implementation of nursing innovations: a literature review

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Abstract

Background Implementation of innovations is a complex and intensive procedure in which different strategies can be successful. In nursing, strategies often focus on intrinsic motivation, competencies and attitudes of individual nurses while ignoring the social context. Since nurses often work in teams, identifying relevant team characteristics and successful team directed strategies may contribute to the implementation of innovations. The literature was searched for evidence.

Methods A literature review was performed including key words related to nursing teams, innovations, team characteristics and team-directed strategies. On-line databases were searched (MEDLINE, CINAHL, PsycINFO, ERIC database and Cochrane reviews CENTRAL). The journal Quality and Safety in Healthcare (QSHC) was hand searched. Methodological quality was assessed.

Results Initially, 323 titles were found. Screening of titles and abstracts and full texts resulted in nine articles meeting the inclusion criteria. The methodological quality of the studies was generally low. The innovations included different types of practices. Fifteen different team characteristics were labeled according to six features of successful teams. Twenty-one different team-directed strategies were identified and inductively categorized.

Conclusion Few studies and little evidence were found for the relevance of team characteristics and team directed strategies in the implementation of nursing innovations. Feedback was most frequently used as a strategy. Leadership could be labeled as a team characteristic as well as a team directed strategy. Further research should be of good methodological quality and focusing on patient outcomes and time and costs invested in strategy delivery. This increases scientific knowledge on nursing implementation strategies focusing on leadership.

Background

Nursing innovations often require a change of nurses' behavior. Attempts to change behavior are likely to be dependent of the functioning of a team. Teams are natural components of nursing units, and the focus of this article. The implementation of innovations often focuses on the intrinsic motivation[1] instead of the extrinsic motivation of teams. Relevant team characteristics and team directed strategies that can affect the successful implementation[2] of an innovation are summarized in this article.

For many years, organizational experts concentrated on organizational efficiency designed to maximize productivity. The assumption was that people do not like to work and must therefore be prodded into action by – among other things – financial incentives, close supervision and clear goals to be attained with minimal effort.[3] This view was shaken by the Hawthorne studies of group productivity[4] which showed that people did not work harder because of environmental changes, but because they were part of a small group that responded positively and productively to special treatment. The Disney studios with their visionary leader and talented artists have similarly ascribed their success to the dynamics of the group and not individual abilities.[5] Organizational experts in the 1980s recommended using small groups to accomplish productivity goals while today's experts have gone one step further with the recommendation of teams to achieve organizational excellence.[4] Teams are described as two or more people working together on specific goal through interrelated activity.[6] Teams tend to be part of a larger organization, and individual team members contribute specific knowledge, skills and abilities to the group. Links between team processes and the implementation of innovations are hardly delineated, however social interactions and cognitive processes and their influence on individual change are described in the social learning theory[7] and the stages of change model.[8] Teams that are prone to implementation of innovation do not guarantee success but do appear to increase effectiveness and team member satisfaction.[3,9,10] To create a safe health care system, providers must understand teamwork as a relationship of interdependence.[11] Since most nurses work in teams, special characteristics of teams may contribute to successful implementation of innovations. Innovations imply the development of new behaviors, the stopping of old behaviors or the modification of current behaviors. To influence these behaviors team-directed strategies can be used, including activities aimed at the rearrangement of specific team qualities such as the use of information and/or the use of peer leaders.[12] Such activities generally require the adoption of a comprehensive approach, taking into account the stage of change[13] and tailored to the specific setting and group(s).[14] Insight in

relevant team characteristics and team directed strategies involving nursing teams lacks. We searched the literature for evidence to answer the question: Which team related characteristics or team directed strategies are effective in improving outcomes for patients?

Methods

Data sources

The MEDLINE, CINAHL, PsycINFO and ERIC databases and Cochran reviews CENTRAL were searched without limits for date of publication, language or study design. The Quality and Safety in Healthcare (QSHC) journal (2000–2006) and references from a key publication[15] were hand searched. Keywords used for MEDLINE were the Mesh terms (Team OR Care team OR Nursing team OR Multidisciplinary team) AND (Implementation of an innovation OR Strategy OR Procedure). Implementation of an innovation as a MeSH term included implementation, meaning the introduction of an innovation in daily routines demanding effective communication and removal of hindrances.[2] Similar combinations were used for searches in the other databases.

Study inclusion

The publications had to meet each of the following three criteria for inclusion in the present review: (1) presentation of results of research on teams in healthcare, including nurses; (2) report on team directed strategies or team factors relevant to the introduction of the innovations; (3) description of an actual diffused and implemented innovation including 'intended practices'. A publication was excluded when the team itself was the innovation (i.e., 'Introduction of twenty-four hour care teams'[16]) or the team itself was the implementation strategy, i.e., 'The role of a specialist team in implementing continuing health care guidelines in hospitalized patients'.[17] Data published in duplicate were included only once.

Three reviewers (GH, EP, TvA) screened all of the title and abstracts independently to assess the relevance and suitability of the study for inclusion in the present review based on the selection criteria. Publications were first selected on title and abstract. When the abstract did not provide sufficient information, the full text was reviewed. All articles that met the inclusion criteria were methodological assessed using the following instruments: the RCT Critical Appraisal Form; QARI Critical Appraisal Instrument for qualitative research.[18] For non-randomized intervention studies, the Notari Textual Critical Appraisal and the assessment instrument by Saunders et al.[19] were used. Disagreements were

resolved by discussion until consensus was reached. Levels of evidence were based upon the study design.

Data extraction

A data extraction form was developed and pilot-tested with three of the nine selected studies and refined accordingly. Three reviewers performed the data extraction. The data extraction form addressed the innovation, the study population, team-characteristics, team-related or team-directed strategy (minimal criteria), outcomes (type of outcome: patient outcome, health worker outcome) and measurement tools (type, psychometrics). The team characteristics were deductively categorized according to group dynamics literature of Forsyth[4] and Franz[6] describing 10 characteristics of successful teams (table 1).

Table 1 Characteristics of successful teams by Franz (2004) and Forsyth (1999)

Team characteristics	Description
Communication	Open communication, including deep listening, supports civilized disagreement and constructive conflict resolution. Successful teams agree on procedures for decision-making and mutually negotiate work boundaries. Effective teams openly share information.
Cohesion	Teams with strong commitment to the goal and each other share values and beliefs about their purpose and personal interactions. A unified commitment through a high level of cohesiveness and participation exists.
Clear purpose	Team members understand the group goal and how it fits the overall work. They have clear direction and understand the nature and complexity of their effort. Team members accept the group's purpose and find it meaningful.
Team member attributes	Talents, attitudes, beliefs, values, and personalities each member brings to the team greatly affect success. Group dynamics fuelled by individual differences, status, power, pressure towards uniformity, and willingness to collaborate affects the team's work. Success often depends on individual readiness to work with others.
Strong relationships	Successful teams build and enhance constructive internal and external relationships in meeting their goals. This requires collaboration across boundaries and interdependence for completing tasks.
Trust and confidence	A high level of trust results in enhanced personal and group confidence. These groups operate informally and provide psychological safety for their members. Groups with strong trust and confidence support risk taking.
Accountability	Results, accountability, and high standards of excellence drive successful teams. Members share responsibility for outcomes, and everyone contributes.
Leadership	Successful work teams thrive when leaders create environments that nurture creativity, accomplishments, and relationships. These leaders are supportive, principled, and serve as coaches and facilitators. They lead group processes that balance task with relationship building and enhance the group's capacity for change.
Clear, enticing roles and responsibilities	Members of successful teams understand what needs accomplishing, and they enjoy working together. They realize individual efforts contribute to the larger organization in a meaningful way.
Physical factors	Successful teams depend on size, material resources, and physical operating environments. The influence of these factors often relates to the nature of the task.

Two researchers independently inductively categorized the team-directed strategies focusing on information, monitoring, feedback and leadership.

Results

The initial search strategy revealed 323 hits, including duplicates. Subsequent selection based on the title and abstract of the publication yielded 113 potentially relevant abstracts. Inspection of the abstracts yielded 35 possibly relevant publications. Moreover, 13 publications were selected based on their full texts (see table 2). Subtracting the duplicates and checking for inclusion and exclusion criteria once more resulted in nine studies meeting the inclusion and quality criteria.

Table 2 Search results for studies of team-related characteristics and team-directed strategies.

	Years searched	Number of hits based on search strategy	Number of hits based on full text
Searches			
Medline	1989-2006	83	4
CINAHL	1982-2006	160	4
PsycINFO	1971-2006	24	2
ERIC Database	1982-2006	29	0
References hits		12	2
Hand searched QSHC	2000-2006	15	1
Cochrane: systematic reviews		0	0
	Total for all searches	323	13
	Duplicates		1
	Two publications on one study		1
	Publications involving team itself as innovation or implementation strategy = exclusion		2
	Total		9

Description of the studies

Seven publications addressed multidisciplinary teamwork; two addressed interdisciplinary teamwork (table 3). Six studies related to teams in hospitals and three to teams in primary care practices. The quality of eight studies was low due to weak design such as a case study.[20] Only one study had a moderate to high level of evidence,[21] permitting evidence based results. In this CCT study, the team's competence with respect to 'the design and implementation of a multidisciplinary team-driven extubation protocol with a positive impact on the patient' was described.[21] However, no statistically significant results were found. Five of the nine studies described team characteristics and seven of the nine studies described team directed strategies.

Table 3 Overview selected studies

					Results found	
Author (Year)	**Research question (Abbreviated)**	**Design**	**Innovation**	**Team sample**	**Team characteristics**	**Team-directed strategies**
Chan[21]	How to design and implement a MDT-driven extubation protocol with a positive and safe impact on the patient and the MD?	Controlled Clinical Trial	Protocol	Intensive Care Unit in an academic university-affiliated hospital	Not defined	On-going re-evaluation and modification of MD input
Cooper[22]	Which intervention strategies influence successful implementation of audit in palliative care?	Action research	Clinical audit	Palliative home care and home support team, day unit staff (n=10)	Not defined	Analysis of previous implementation projects Bottom-up approach Collaboration External facilitator Continuous monitoring Regular feedback
Edmondson[23]	How do leaders of action teams promote learning in interdisciplinary teams?	Multiple Case study Pretest-Posttest Design	New technology for cardiac surgery	Cardiac surgery teams (n=16)	Team stability Team preparation Communication Differences in expertise Boundary spanning Ease of speaking up Psychological safety Supportive organizational context	Not defined
Galvin[24]	What are key areas for change and what are additional nursing skills for teams?	Action research	User initiated service	Primary health care nursing team (n=7)	Not defined	Regular team meetings Task analysis Team workshops Reflective diaries
Gibbon [25]	Do team-coordinated approaches to stroke care and rehabilitation improve staff attitudes to working in a team?	Pretest-Posttest Design	Integrated care pathway and unified team notes	Stroke units (n=4) during baseline and post-inter-vention Patients (n=122)	Ignorance Jealousy Perceived loss of autonomy Threat to professional status Vision Participative safety Task orientation Support for innovation	Not defined

					Results found	
Author (Year)	**Research question (Abbreviated)**	**Design**	**Innovation**	**Team sample**	**Team characteristics**	**Team-directed strategies**
Gosling[15]	What is the association between clinical team functioning and the adoption and diffusion of an online evidence retrieval system?	Cross-sectional obser-vational study	Evidence retrieval system	Teams (n=18) Clinicians (n=180)	Vision Participative safety Task orientation Support for innovation	Not defined
Hobbs[26]	What are the effects of structured programme to reduce pressure ulcers?	Pretest-Posttest Design	Turn-team nursing programme	Geriatric nurses	Not defined	8-hour training programme Team approach with identified responsibilities Bi-weekly meetings of staff with management Monitoring by senior nursing staff
Rubenstein[20]	What are the effects of quality improvement teams and their environments in depression care improvement programmes?	Comparative formative evaluation	Quality improvement programme	Primary care practices (n=6)	Expert team leadership Support from management Support from specialist Clear purpose	Not defined
Victor[27]	How to implement kangaroo care in Intensive Care Unit : A parent health-care team approach.	Case-study	New care (Kangaroo) approach	Intensive Care Unit (n=1)	Mutual respect Clearly articulated support Vision	Continual monitoring and education Use of parental input Use of the 'What if' game Discussion meetings Information sessions Review of articles Use of peer leaders Accent on positive outcomes

Types of innovations

The innovations of the nine studies included, the implementation of a clinical audit in a palliative care setting;[22] an user-led service in a primary care setting;[24] a quality improvement programme;[20] a multidisciplinary team driven extubation protocol in an Intensive Care Unit;[21] kangaroo care in an ICU;[27] a new technology for cardiac surgery;[23] a

turn-team programme to reduce pressure ulcer prevalence in a geriatric hospital;[26] integrated care pathway and unified team notes;[25] and the implementation of an evidence retrieval system[15] (table 3).

The innovations all involved 'proposed practices', which meant that new behaviors had to be developed, old behaviors had to be stopped or current behaviors had to be modified with team functioning as the focus of the efforts. Five of the nine studies described team characteristics and seven of the nine studies described team directed strategies, which meant that three studies described team directed characteristics as well as team directed strategies.

Team characteristics

Team characteristics were described in five studies.[15,20,23,25,27] Fifteen different team characteristics associated with implementation of innovations were identified in five different publications, using both quantitative (controlled clinical trial (CCT), pretest–post-test design (PPT), cross sectional, case study) and qualitative designs (action research, comparative formative evaluation). These characteristics can be categorized in 6 of the 10 features related to successful teams as described by Forsyth[4] and Franz[6] (table 1). Team characteristics relating to trust and confidence, clear purpose, and leadership dominate (tables 4 and 5).

Table 4 Overview of team characteristics associated with implementation of innovation

Communication	Clear purpose	Team member attributes	Trust and confidence	Leadership	Roles and responsibilities
Communication[23]	Vision[15,20,25,27]	Staffing level expertise[23]	Jealousy[25]	Expert team leadership[20]	Boundary spanning[23]
	Task orientation[15,25]		Ignorance[25]	Management Support[15,20,23,25,27]	Perceived loss of autonomy[25]
			Stability[23]		Threat to professional status[25]
			Safety[15,23,25]		
			Mutual respect [27]		
			Team preparation[23]		

Table 5 Overview of team-directed strategies inductively grouped to five different categories

Education	Monitoring	Feedback	Leadership	Other
Team workshop[24]	Monitoring [22,26]	Ongoing re-evaluation and modification[21]	Leadership downplaying the power imbalance[15]	Action research[20]
Information session[27]	Continual monitoring and education[27]	Feedback[22]	Coached leadership[15,21]	Audit process[27]
Training programme[26]		Reflective diaries[24]	Use of peer leaders[27]	
		Task analysis[24]	Use of input from family[27]	
		'What if…?' game[27]		
		Review of articles[27]		
		Emphasizing positive outcomes[27]		
		Discussion meetings[27]		
		Focus group interviews[27]		
		Biweekly reflection meetings[26]		

Communication

One study showed that communication is optimal in small teams (<15 members) and contributes to learning, when implementing a new technique or procedure.[23]

Clear purpose

A clear purpose (vision) is described as conducive to teams associated with implementation of innovations.[15,20,25,27] Team objectives are shared and agreed upon before implementing an integrated care pathway or an evidence retrieval system.[15,25] Team goal setting requires leadership at the outset to establish a clear, shared and attainable vision.[20,27] Task orientation and speaking up in the service of learning directly contribute to an effective and innovative team climate.[15,25]

Team member attributes

One study[23] described that a right mix of experience and skills is needed to establish a team identity in fast-paced action contexts as an ICU, emergency room or operating theatre when implementing a new technology for cardiac surgery.

Trust and confidence

Team characteristics related to levels of support and challenges are described in four studies.[15,23,25,27] Psychologically safe feelings in the team are conducive to easily propose new and improved ways of doing things and participate in decision-making processes. The extent to which team members feel free to communicate observations, questions and

concerns can critically influence team outcomes, especially members of operating room teams who must act in often uncertain and fast-paced situations.[23]

Leadership

Five studies[15,20,23,25,27] described characteristics relating to leadership. From a case study on implementing 'kangaroo care', Victor and Persoon[27] concluded that leadership through management support must be clearly articulated and enacted. Perceived lack of support or uncertainty about the intentions of management was described as having disastrous effects on morale and overshadows attempts encouraging effective teamwork.

The Team Climate Inventory (TCI) was used in a pre-post and cross-sectional design, addressing the team climate in relation to the implementation of an innovation.[15,25] This instrument is a multidimensional measure of team climate focusing on five different factors of team success including vision, support for innovation, task orientation and participative safety with the subscale 'information sharing and interaction frequency' and the subscale 'safety and influence'.[28,29]

Leadership is mainly described in the context of management support and once described in the context of expert team leadership.[20]

Roles and responsibilities

Two studies[23,25] described features related to roles and responsibilities in teams. Clearly defined roles, a clear understanding of one's own role and the roles of colleagues positively affect team functioning in the domain of stroke care.[25] Additionally, clearly defined roles prevent perceived losses of autonomy and decrease perceived threats to one's professional status or boundary spanning.[23,25]

Team-directed strategies

Twenty-one different team-directed strategies were identified in seven studies using both quantitative and qualitative designs.[15,20-22,24,26,27] All strategies were inductively categorized focusing on education, monitoring, feedback, leadership and 'other'. Integrated strategies were used most often, feedback dominated. Only one study described team characteristics as well as and team directed strategies,[27] however no relation was described.

Education

Three studies[24,26,27] described strategies directly associated with education. In one study[27] workshops were used examining findings from data, exploring key areas of patient need and ideas about how practice could be changed in a primary health care nursing team. Information sessions were used in one study[27] for patients and nursing team implementing kangaroo care. A training programme was given in combination with biweekly reflection meetings using a pre-post design informing the team about a more holistic approach stressing the importance of systematic, preventive care in order to reduce the incidence of pressure ulcers.[26]

Monitoring

Three studies[22,26,27] used monitoring as a team directed strategy. One study[27] described a case study with integrated team directed strategies implementing kangaroo care. Continual monitoring was used to persuade nursing staff to share decisions about parental participation. A turn team programme reducing the incidence of pressure ulcers[26] used integrated team directed strategies including monitoring of patients referrals to the enterosotomal nurse, the average length of stay, musculoskeletal injuries among staff and incidence of nosocomial infections.

Feedback

Five studies[21,22,24,26,27] described feedback related activities as team directed strategies. In one study[24] task analysis and reflective diaries were integrated persuading a primary health care team to change to a new method of working. Each member of the team record a typical working week highlighting key tasks and responsibilities that identified the practice boundaries and specific specialist and generic areas of practice. A summary of key tasks made the types of activities performed by different nurses more apparent. In addition, focus group interviews with patients evaluated the performance of the primary health care team. The implementation of kangaroo care[27] combined different team directed strategies as well. Nurses were convinced of the value of the innovation by emphasizing the positive outcomes and playing the 'What if ...?' game. This game helped monitoring the most important infant parameters during kangaroo care and evaluating infant responses. Reviews of articles were discussed in meetings stressing positive outcomes for patients, parents and nurses. One study[21] stressed the importance of ongoing re-evaluation and modification of a protocol. Prompt and relevant feedback on the progress of the implementation of an audit in palliative care[22] and biweekly meetings

reflecting on the progress of the implementation of the turn-team[26] were positively associated with successful implementation of the innovations.

Leadership

Leadership as a team directed strategy was described in three studies.[15,21,27] Leadership is used downplaying the power imbalance through coached leadership.[15] Attention for psychological safety, the presentation of a clear rationale for change and coaching by team leaders, enhance the durability of an innovation.[27] An environment that ensures psychological safety gains respect for the various ways in which professionals communicate and speak up. Motivation and coaching by the team leader encourages team members to speak openly within the team and communicate with others in the organization about ongoing changes. The presentation of clear rationales by the team leader helps individuals to focus. Coaching influences individual performance and can thus greatly affect an organization's capacity to execute. These behaviors constitute part of a multifaceted team learning process that clearly enables successful implementation.[21]

Other

One study[22] used the combination of an action research approach and audit cycle to facilitate a change in palliative care. Both processes have similarities as they are cyclical in nature and include the elements of planning, review and feedback.

Discussion and conclusion

Introduction of innovation and change in health care is difficult and many programs for improving care are, at best, only partly successful. Our review departed from the presupposition that the team functioning is relevant to the quality of patient care. Insight in relevant team characteristics and in influencing team functioning through team directed interventions is lacking. Since teams are natural components of nursing units, we decided to search the literature for evidence. Various descriptions of team characteristics and approaches towards change were found and described, but due to weak research methods, the relevance of team characteristics and team directed strategies was not clearly demonstrated.

Our literature review yielded few studies (9) and little evidence. We expected to find team characteristics and related single or combined strategies described together in one study, however only one study described relevant team characteristics and matching team directed strategies.

Leadership is described as a team characteristic as well as a team directed strategy. This is in line with successful team characteristics as described by Franz[6] and Forsyth.[4] Furthermore, this finding matches the advice of the Institute for Health Improvement and other worldwide safety related institutes. These institutes propose leadership in combination with small steps of change and monitoring as a valuable team directed change strategy.

Action research was twice reported as a strategy to improve the functioning of a team during the implementation of an innovation. The involvement of a researcher in this process could come with difficulties. Some authors argue that the researcher can serve as a facilitator or catalyst and thus help nurses develop their own analyses, assist with the implementation of an innovation and ultimately serve as a resource person. Others find the outsider role to be quite difficult, particularly when the team wants to adopt a bottom-up, practice-based approach and thus have someone coordinate the innovation endeavor from within. The role and responsibilities of the researcher may also blur under such conditions and possibly lead to outcomes, which are questionable.

More research on team characteristics and team directed strategies is needed. This research should include studies focusing on patient outcomes and time and costs invested in strategy delivery. This will add to the further development of nursing implementation science and evidence based nursing practice. Research could especially focus on leadership and the ability of leaders to put ideas into practice.

Health care providers in general and nurses in particular need explicit suggestions on effective communication and teamwork rather than learning by trial and error, which can instill unintended values, attitudes, and behaviors.

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Chapter 6

Team climate and process indicators for quality of care: an evaluation of the criterion-related validity of the Team Climate Inventory (TCI).

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Abstract

Objective To evaluate the criterion-related validity and responsiveness of the Team Climate Inventory (TCI), an instrument to assess team climate, in relation to process indicators for quality of care.

Methods Exploratory correlational study, embedded in two cluster randomized trials on guideline implementation, using a sample of 42 Dutch nursing teams.

Outcome measures Relationships between TCI scores and indicators of preventive nursing care. The responsiveness of the TCI instrument to change following a quality improvement strategy aimed at influencing team climate.

Results Relationships between TCI scores and indicators of preventive nursing care were not significant. We found no significant correlations between changes in team climate scores and preventive nursing care, before and after the interventions. TCI scores did not respond to an implementation strategy aimed at influencing team climate.

Conclusion This study did not confirm the criterion-related validity, nor the responsiveness of the TCI. These findings raise the question whether the TCI can measure team climate in health care processes. Further studies are needed to explore the relationship between team climate and quality of care.

Background

Compliance with clinical guidelines and teamwork are important prerequisites for quality of care.[1,2] Quality of care and teamwork are related and one of the teamwork factors that can be measured is team climate.[2-5] Team climate concerns psychosocial processes at group level and is defined as 'a team's shared perception of organizational policies, practices and procedures'.[6] Research indicates that a good team climate is associated with quality of care.[6-10] Therefore, adequately assessing team climate may provide useful information for a further improvement of quality of care .

Anderson and West developed an instrument to assess team climate.[6] They conclude that four factors contribute to team climate; 'vision', 'participative safety', 'task orientation', and 'support for innovation'. Their 'Team Climate Inventory' (TCI)[9] has been translated into several languages[10-14] and is used as a diagnostic and evaluative instrument.[4,15-17]

The TCI was psychometrically tested, using teams working in organizations as varied as health care, social services, government and industry. On the basis of these tests, it was concluded that the TCI exposed the four factor structure and had acceptable reliability in terms of internal homogeneity.[6,10-14] Acceptable criterion-related validity was found in a British and Swedish study correlating the TCI with innovativeness of teams[6,10] as well as in a Norwegian study correlating the TCI and customer satisfaction.[13] However, studies measuring the relationship between team climate and quality of care using clinical process indicators, and studies assessing the responsiveness of the TCI to changes at team level, were not found. Since teamwork and quality of care are related[2,4] we decided to study the ability of the TCI to demonstrate this identified relationship. Furthermore, we investigated whether the TCI scores responded to change after the implementation of a quality improvement strategy aimed at influencing team climate.

Three hypotheses were tested: 1. TCI scores and process indicators for adequate quality of care are related; 2. Changes in quality of adequate care process indicators are related to changes in TCI scores 3. TCI scores respond to the application of a quality improvement strategy aimed at influencing team climate.

Methods

Study design

Correlational statistical methods were applied to measure the criterion-related validity and responsiveness of the TCI. This study was embedded in two cluster randomized trials evaluating guideline implementation to improve quality of care. The first trial tested the effect of an integrated patient safety program (Safe or Sorry; SorS).[18-20] The second trial

(Helping Hands; HH) evaluated the effects of two different strategies for promoting hand hygiene.[21,22] See table 1.

Table 1 Summary of the two trials

Trial	1. Safe or Sorry (SorS)	2. Helping Hands (HH)
Aim	To test the effect of an integrated patient safety program on the incidence of three adverse events (pressure ulcers, urinary tract infections, and falls) and the preventive care given to patients at risk.	To evaluate the short-term and the long-term effects of two different strategies for promoting hand hygiene in hospital nurses.
Trial design	Cluster randomized controlled clinical trial in the Netherlands between September 2006 and November 2008 .	Cluster randomized controlled trial in the Netherlands between September 2008 and November 2009.
Data collection	Baseline period (September 2006) and at the start of the follow-up period (February 2008).	Baseline (December 2008) and immediately at the start of the follow-up period (July 2009).
Analyzed TCI questionnaires	243 at baseline and 173 at follow-up	222 at baseline and 182 at follow-up
Intervention	The implementation of an integral patient safety program (Safe or Sorry?) for the prevention of pressure ulcers, urinary tract infections and falls. A multifaceted implementation strategy was applied using education, patient involvement, feedback through a computerized program and a tailored implementation plan.	Two implementation strategies were implemented: the state-of-the-art strategy (SAS) versus the team and leaders- directed strategy (TDS) to improve nurses' compliance with hand hygiene (HH) prescriptions. The SAS focused on determinants at the individual and at the organizational level, including the following components: a) education to improve relevant knowledge and skills, b) reminders to support the actual performance of HH, c) feedback as a means of providing insight into current HH behavior and reinforcing improved behavior d) screening for adequate HH products and adequate facilities. The TDS included all components of the SAS (a through d) supplemented with e) gaining active commitment and initiative of ward management f) modeling by informal leaders at the ward, and g) setting norms and targets within the team.
Study population included in this study	20 nursing teams (416 nurses)	22 nursing teams (404 nurses)
Process outcome measure for this study	The percentage of patients at risk who received preventive care according to the guidelines.	The percentage of hand hygiene compliance.

Study population

We used data from forty-two nursing teams in our study: ten nursing teams from four different hospitals and ten nursing teams from six different nursing homes, in the SorS trial. Another twenty-two nursing teams from two different hospitals in the HH trial were also included.

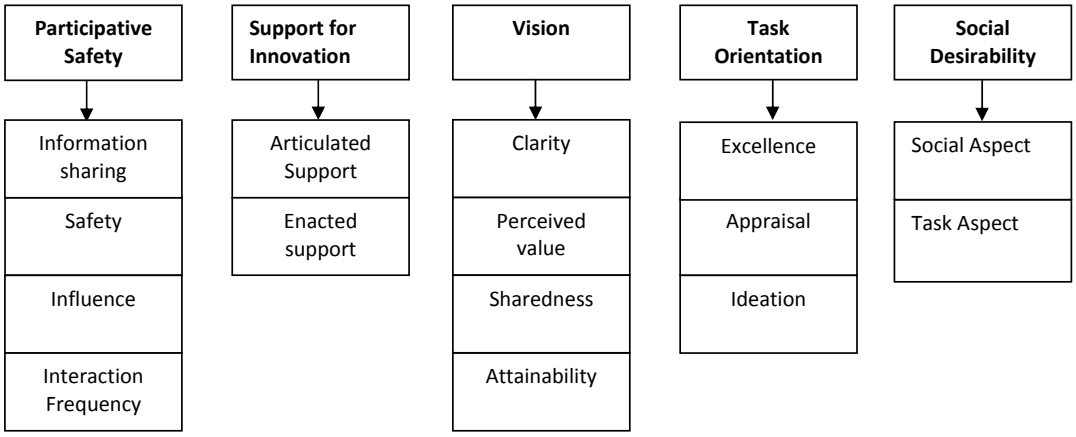
Outcome measures

The outcome measures for this study were: 1. Relationships between TCI scores and indicators of preventive nursing care. 2. Relationships between changes in TCI scores and changes in measures of preventive care. 3. The responsiveness of the TCI instrument to change following a quality improvement strategy aimed at influencing team climate.

The TCI questionnaire

The 44 items of the TCI questionnaire load on 15 sub-factors, which in turn load on four second order factors of climate and one social desirability response factor (figure 1).[9]

Figure 1 The structure of the 44-item Team Climate Inventory



The TCI questionnaire had to be completed individually and anonymously at two time points; before (baseline) and after the intervention (follow-up). Respondents were asked to indicate on a five-point Likert scale to what extent they agreed with each item. A high score (5) indicated a very good team climate. In the 'Safe or Sorry' trial, all nurses of the participating wards were asked to complete the TCI questionnaire. In the 'Helping Hands' trial, half of the ward nurses in the intervention groups and in the control groups were asked to participate, while the other half filled in another questionnaire.

Adequate preventive care in the 'Safe or Sorry?' trial

Adequate preventive care is defined as care according to the recommendations of current guidelines on the prevention of pressure ulcers,[23-25] urinary tract infections[26,27] and falls.[28,29] Trained independent research assistants collected the data 1) during a weekly visit and 2) by three additional observations on every ward.

The outcome, 'adequate' preventive care given, was calculated for each potential adverse event (pressure ulcers, urinary tract infections and falls) separately in patients who were at risk. Mean percentages of the 'adequate' preventive care in the intervention groups (INT) and in the usual care (UC) groups at baseline and follow-up were calculated. For a detailed description of the data collection, see Van Gaal et al.[20]

Hand Hygiene compliance in the 'Helping Hands' trial

Trained observers, using a standardized observation tool, unobtrusively measured HH compliance. This tool was adapted from the WHO and represents the guidelines from the WHO as well as the Working Group Infection Prevention (WIP). Mean compliance percentages were calculated for the intervention group (Team and Leaders-directed Strategy, TDS) and the usual care group (State-of–the-Art, SAS). For a detailed description of the data collection, see Huis et al.[22]

Data Analysis

Criterion-related validity

Criterion-related validity (concurrent) refers to the extent to which the results from one measure are associated with the results from a separate measure, assessed simultaneously.[30] We used the baseline scores of the TCI as well as the baseline scores on the process indicators of the SorS and HH trial to calculate correlations between TCI scores and process indicators for adequate quality of care. Pearson rank correlation test was used for the normally distributed data of the HH trial, while Spearman rank correlation test was used for non-normally distributed data of the SorS trial.

Subsequently, changes in quality of adequate care process indicators, (though not including a specific team intervention), in relation to changes in TCI scores were calculated. We used change from baseline scores of the TCI and of the process indicators of the SorS trial to calculate the correlation between changes in total TCI scores and changes in percentages of adequate preventive care.

Responsiveness

Responsiveness (or sensitivity to changes) is the ability to detect change over time.[31] It characterizes the ability of a measure to change over time, when a change is expected. We used the HH data as we expected the team climate to change after the implementation of the team and leaders-directed strategy (TDS). Differences in TCI scores before and after the implementation of the TDS were analyzed using independent-sample

t-tests to compare the TCI change scores between teams receiving the TDS and teams receiving the state-of-the-art strategy (SAS).

Results

General

Forty-two nursing teams were included: twenty teams from the 'Safe or Sorry' trial and twenty-two teams from the 'Helping Hands' trial. A total of 243 TCI questionnaires at baseline and 173 at follow-up were analyzed in the 'Safe or Sorry' trial. A total of 222 TCI questionnaires at baseline and 182 at follow-up were analyzed in the 'Helping Hands' trial.

TCI scores and process indicator scores for quality of care

Table 2 shows mean values for the TCI total scores and the four factor scores separately, the adequate preventive care percentages and compliance percentages in the two study samples at baseline and follow-up. Mean values for the TCI total scores and the four factor scores for both samples varied between 3.28 and 3.84 (table 2) in all teams (n=42).

Table 2 TCI scores, adequate preventive care percentages and compliance percentages in two study samples

	Baseline		**Follow-up**	
Safe or Sorry (n=20)	**TCI scores**		**TCI scores**	
	INT	**UC**	**INT**	**UC**
Total TCI	3.59(0.17)	3.66(0.34)	3.58(0.18)	3.68(0.26)
Participative Safety	3.66(0.18)	3.62(0.23)	3.68(0.21)	3.67(0.24)
Support for Innovation	3.52(0.25)	3.37(0.31)	3.39(0.21)	3.56(0.29)
Vision	3.72(0.35)	3.61(0.23)	3.60(0.19)	3.75(0.32)
Task Orientation	3.84(0.38)	3.67(0.36)	3.64(0.21)	3.76(0.29)
	Adequate preventive measures		**Adequate preventive measures**	
APC Pressure ulcers	25%	26%	23%	26%
APC Urinary tract infections	48%	45%	40%	44%
APC Falls	0	1%	17%	2%
	Baseline		**Follow-up**	
Helping Hands (n=22)	**TCI scores**		**TCI scores**	
	TDS	**SAS**	**TDS**	**SAS**
Total TCI	3.48(0.24)	3.74(0.19)	3.54(0.20)	3.65(0.25)
Participative Safety	3.57(0.28)	3.80(0.22)	3.64(0.17)	3.69(0.25)
Support for Innovation	3.28(0.32)	3.56(0.23)	3.36(0.22)	3.59(0.31)
Vision	3.61(0.28)	3.80(0.25)	3.63(0.18)	3.65(0.30)
Task Orientation	3.45(0.27)	3.81(0.20)	3.55(0.33)	3.73(0.30)
	Compliance percentage		**Compliance percentages**	
Compliance	25%	34%	62%	44%

Values represent mean (st.dev) unless stated otherwise. INT=intervention, UC=usual care,
APC= adequate preventive care, TDS=team and leaders- directed strategy, SAS= state-of-the-art strategy.

TCI and quality of care at baseline

We did not find any statistically significant positive correlations between TCI scores and percentages of adequate preventive care and percentages of hand hygiene compliance at baseline (table 3). One significant negative correlation was found between adequate preventive care for patients at risk for urinary tract infections and the TCI factor 'vision'.

Table 3 Correlation coefficients between TCI scores and percentages of adequate preventive care and between TCI scores and percentages of hand hygiene compliance at baseline

Baseline	Safe or Sorry		Helping Hands	
	APCPU[1]	APCUTI[1]	APCfalls[1]	Compliance[2]
Total TCI	-.29	-.37	.21	-.16
Participative Safety	.03	-.18	-.25	0.20
Support for Innovation	-.06	-.16	-.23	-.14
Vision	-.05	-.48*	.18	-.09
Task Orientation	-.06	-.24	-.03	0.02

*p <.05; APC = adequate preventive care, PU=Pressure ulcers, UTI=Urinary tract infections.
[1] Spearman's rank correlation coefficient [2] Pearson's product-moment correlation coefficient

TCI and changes in quality of care

Significant correlations between changes in total TCI scores and changes in percentages of adequate preventive care were not found (table 4). We did however find a significant correlation between changes in TCI scores for the factor 'support for innovation' and changes in percentages of adequate preventive care given to patients at risk for falls. The correlation between these two variables is negative.

Table 4 Spearman rank correlation coefficient between changes from baseline to follow-up in TCI scores and changes in percentages of adequate preventive care

Change scores	Safe or Sorry		
	APC PU	APC UTI	APC falls
Total TCI	-.27	-.30	-.21
Participative Safety	-.33	.12	-.21
Support for Innovation	-.05	-.08	-.47*
Vision	.02	-.38	-.45
Task Orientation	.03	.12	-.33

*p <.05; APC = adequate preventive care, PU=Pressure ulcers, UTI=Urinary tract infections

Responsiveness of the TCI

The differences in TCI scores before and after the delivery of a team and leaders- directed implementation (TDS) strategy were small (<0.15) and not significant (table 5).

Table 5 Results from Independent samples t-test comparing TCI change sores

Helping Hands	Baseline		Follow-up		Change scores		
	TDS	SAS	TDS	SAS	TDS	SAS	p*
Total	3.48(0.24)	3.74(0.19)	3.54(0.20)	3.65(0.25)	0.06(0.25)	0.09(0.18)	0.12
Participative Safety	3.57(0.28)	3.80(0.23)	3.64(0.17)	3.69(0.25)	0.08(0.30)	0.11(0.26)	0.16
Support for Innovation	3.28(0.32)	3.56(0.23)	3.36(0.22)	3.59(0.31)	0.08(0.27)	0.03(0.21)	0.63
Vision	3.62(0.28)	3.80(0.25)	3.63(0.18)	3.65(0.30)	0.00(0.30)	0.14(0.30)	0.30
Task Orientation	3.45(0.27)	3.81(0.20)	3.55(0.33)	3.73(0.30)	0.08(0.42)	0.09(0.18)	0.12

Values represent mean (st dev). TDS= Team and leaders- directed strategy, SAS= State-of-the art strategy

Discussion

This study explored the criterion-related validity and responsiveness of a Dutch version of the Team Climate Inventory (TCI). We used data from 42 nursing teams, participating in two longitudinal quality improvement trials. Three hypotheses were tested: 1. TCI scores and process indicators for adequate quality of care are related; 2. Changes in quality of adequate care process indicators are related to changes in TCI scores 3. TCI scores respond to the application of a quality improvement strategy aimed at influencing team climate. We could not confirm these hypotheses in this study.

This is the first study in which the criterion-related validity and responsiveness of the TCI is studied in a population of nursing teams, using process indicators as outcome measures for quality of care. Previously, the TCI was used as an instrument to explore attributes of care; however, a consistent relationship with measures of quality has not yet been studied. This is perhaps surprising, given the fact that the TCI's purpose and results of research indicate that a good team climate is associated with quality of care.[7] It would therefore be reasonable to assume that a high score on the four factors of the TCI (vision, participative safety, task orientation, and support for innovation) makes the delivery of high quality of care more likely. Nevertheless, we did not find any significant correlations between changes in team climate scores and preventive nursing care, both before and after the interventions. Additionally, TCI scores did not respond to an implementation strategy aimed at influencing team climate. Consequently, we could not confirm the criterion-related validity of the TCI.

A possible explanation for our results concerns some methodological considerations. First, it concerns the validity and reliability of the process indicators used in trial 1. We used clinical process indicators to measure quality improvement, as their results would provide us with concrete information to guide improvement programs and change interventions.[32] To measure quality of care accurately, these quality indicators should be valid and reliable, yet the measurement properties of the process indicators used in our

Safe or Sorry study had not been tested. Secondly, we observed no subsequent changes in the adequate preventive scores for pressure ulcers, urinary tract infections and TCI sores in trial 1 after the intervention. This could explain the fact that no significant correlations between changes in TCI scores and changes in percentages of adequate preventive care were found. Finally, we measured change in the team climate at team level after the implementation of implementation strategies that were targeted at teams. Consequently, in the 'Helping Hands' trial, we used an implementation strategy that was specifically designed at influencing team climate. The interventions of this team and leaders-directed strategy (TDS) targeted the social interaction within the participating teams of nurses and were linked to the four factors of the TCI.[22] We expected the team and leaders-directed strategy (TDS) to improve team climate, thereby contributing to better hand hygiene compliance. Although the TDS did indeed lead to significantly better hand hygiene compliance, team climate as measured with the TCI did not change.[22] A possible explanation for the improvement of the compliance rate might be that the TDS targeted other aspects of team work, rather than team culture. After all, the TDS used additional interventions (modeling by informal leaders, gaining active commitment and initiative of ward management), which were not directly targeted at the four factors of the TCI. These results suggest that the TCI is not sensitive enough to measure changes in the team climate.

Considering the results of our study we have no reason to question the relationship between team work and quality of care, but we do question whether team climate in health care processes can be measured using the TCI. The TCI did not act as expected. Further research is needed to adequately measure the relationship between teamwork and quality of care in nursing teams and other contextual factors using different outcome measures.

An alternative instrument for measuring the relationship between quality of care and contextual factors in nursing teams is the Practice Environment Scale of the Nurse Work Index (PES-NWI) by Lake.[33] This instrument measures the relationship between the quality of the nursing practice environment and the quality of care perceived.[34] The nursing practice environment is defined as 'the organizational characteristics of a work setting that facilitate or constrain professional nursing practice and is a proxy for teamwork'. Apart from team climate aspects, leadership aspects are also assessed. This instrument has been recognized for the conduct of research and practice.[35]

Conclusion

We could not confirm the criterion-related validity and responsiveness of a Dutch version of the Team Climate Inventory (TCI) when applied in nursing teams. This raises the question whether the TCI is sensitive enough to measure associations between team climate and quality of care, or to respond to team interventions. Further studies using different instruments and different attributes of teamwork may clarify the relationship between teamwork and quality of care.

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Chapter 7

Explaining the effects of two different strategies for promoting hand hygiene in hospital nurses: a process evaluation alongside a cluster randomized controlled trial

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Abstract

Background There is only limited understanding of why hand hygiene improvement strategies are successful or fail. It is therefore important to look inside the 'black box' of such strategies, to ascertain which components of a strategy work well or less well. This study examined which components of two hand hygiene improvement strategies were associated with increased nurses' hand hygiene compliance.

Methods A process evaluation of a cluster randomized controlled trial was conducted in which part of the nursing wards of three hospitals in the Netherlands received a state-of-the-art strategy, including education, reminders, feedback, and optimizing materials and facilities; another part received a team and leaders-directed strategy that included all elements of the state-of-the-art strategy, supplemented with activities aimed at the social and enhancing leadership. This process evaluation used four sets of measures: effects on nurses' hand hygiene compliance, adherence to the improvement strategies, contextual factors, and nurses' experiences with strategy components. Analyses of variance and multiple regression analyses were used to explore changes in nurses' hand hygiene compliance and thereby better understand trial effects.

Results Both strategies were performed with good adherence to protocol. Two contextual factors were associated with changes in hand hygiene compliance: a hospital effect in long term ($p < 0.05$), and high hand hygiene baseline scores were associated with smaller effects ($p < 0.01$). In short term, changes in nurses' hand hygiene compliance were positively correlated with experienced feedback about their hand hygiene performance ($p < 0.05$).

In the long run, several items of the components 'social influence' (i.e., addressing each other on undesirable hand hygiene behavior $p < 0.01$), and 'leadership' (i.e., ward manager holds team members accountable for hand hygiene performance $p < 0.01$) correlated positively with changes in nurses' hand hygiene compliance.

Conclusion This study illustrates the use of a process evaluation to uncover mechanisms underlying change in hand hygiene improvement strategies. Our study results demonstrate the added value of specific aspects of social influence and leadership in hand hygiene improvement strategies, thus offering an interpretation of the trial effects.

Background

Strategies to improve adherence to practice guidelines are often multimodal and consist of a number of potentially effective components and related improvement activities (see table 1).[1-3] All of these components might influence effectiveness both independently and interdependently. This poses challenges for strategy evaluation. A randomized controlled trial (RCT) is the most rigorous way to evaluate the effectiveness of improvement strategies, regardless of their complexity. However, published reports of RCTs mainly focus on the outcomes, answering the question 'Does it work?'.[4,5] RCTs rarely answer the question of why an improvement strategy has been successful or has failed.[6] Despite the CONSORT guidelines,[7] a detailed description of an improvement strategy — reporting on all components and corresponding activities — and how well the strategy was performed is often lacking. This equally applies to information on contextual aspects such as the environment or setting, as well as factors that inhibited or promoted effectiveness.[4,8] Understanding RCT results is also complicated by the use of intention-to-treat analyses. To provide unbiased comparisons among the treatment groups, individuals or clusters are analyzed according to the group (experimental or control) to which they were originally allocated, regardless of whether they actually received the improvement strategy. Therefore, it is necessary to combine the strength of an RCT with a well-designed process evaluation.[9]

Table 1 Explanation of terms used in this article

Term	Explanation
Hand hygiene (HH)improvement strategy	A HH improvement strategy is composed of a number of components intended to change HH behavior. These various components work best together and support each other in targeting potential barriers to appropriate HH.
Strategy component	A strategy component refers to the specific method used to address a potential barrier to appropriate HH. Examples: education, reminders, performance feedback, social influence, leadership, setting norms and targets.
Improvement activities	Improvement activities refer to the operationalization of strategy components. Examples: educational website, bar charts of HH rates, posters, ward manager addresses barriers to enable HH as recommended, provision of alcohol-based hand rub.
Intention-to-treat analysis	The intention-to-treat analysis in our study was an analysis based on the initial treatment intent. In this, wards were analyzed according to the group (experimental or control) to which they were originally allocated, regardless of whether they actually received the improvement strategy and despite the fact that there may be less impact on those who did not receive the intervention
As-received analysis	The as-received analysis in our study is based on the treatment actually received. In this, wards were analyzed according to improvement strategy actually received, regardless of their allocation.

Process evaluations are important because they can clarify to what extent the improvement strategy was performed in a uniform way, whether the target population actually received the planned activities, what factors inhibited or promoted effectiveness, and what the participants' actual experiences with the executed strategy were.[5,10-12] Process evaluations also provide information important to understanding and validating theory-informed strategies. Identifying the mechanisms for how and why these strategies produce successful change (or fail to produce change) is crucial to refining theory and improving strategy effectiveness.[13]

Combined analysis of process and outcome data allows evaluations to explore associations between strategy delivery and receipt, and outcomes on effectiveness.[14] In this way, insight is gained into the mechanisms responsible for the results, which could improve the validity of the findings and help researchers understand the potential generalizability of the improvement strategy.[10,11,15]

The case of hand hygiene: the Helping Hands study

Hospital acquired infections are the most common complications in hospital care, and a major threat to patient safety.[3,16] Hand hygiene (HH) is considered the most important measure in the prevention of hospital acquired infections.[3,17,18] Unfortunately, compliance with HH recommendations is repeatedly found to be insufficient.[3,17,18] Many potentially effective strategies for improving HH compliance are described, but most of the effects are small to moderate.[2,19,20] Traditionally, strategies have concentrated on the healthcare professional or focused on the introduction of new products and facilities.[2,20] However, often experienced barriers like negative role models, lack of management involvement, and poor social culture are rarely addressed.[21] Using insights from the behavioral sciences and performing a strategy that also targets social influence within teams and leadership could be a valuable addition to HH implementation strategies.[21-23]

In a recent study, we undertook a cluster randomized trial (the Helping Hands study) at 67 nursing wards in three Dutch hospitals to compare the effectiveness of a state-of-the-art strategy with a team and leaders-directed strategy for improving nurses' compliance with HH guidelines.[24,25] The state-of-the-art strategy was based on current evidence from literature on HH compliance.[3,16,20] This strategy targeted the individual and organizational level and included the following components: education for improving relevant knowledge and skills; reminders for supporting the actual performance of HH; feedback as a means to provide insight into current HH behavior and to reinforce improved behavior; and screening for adequate HH products and adequate facilities. The team and

leaders-directed strategy was also aimed at addressing barriers at team-level by focusing on social influence within teams and strengthening leadership of the ward manager. The unique contribution of this strategy was built upon the social learning theory,[26] social influence theory,[27] theory on team effectiveness,[28,29] and leadership theory.[30] Together, these theories provide a coherent set of methods to target the social context in which HH behavior takes place. Table 2 provides an overview of our theory selecting process, including the characteristics and key elements of the behavior change theories.

Table 2 Selected behavior change theories matching barriers in performing HH

Theory	Focus	Key elements
Social learning theory [26]	Behavior is learned from the environment through the process of observational learning.	– Demonstration, role modelling. – Encompasses attention, memory, and motivation.
Social influence theory[27]	Social norm in a network determines what correct behaviour is.	– Norm and target setting. – Commitment team members. – Use of opinion leaders. – Performance feedback. – Team members address each other in case of undesirable behavior.
Theory on team effectiveness [28,29]	Orientation on team climate and willingness to change	– Team Vision: clarity, perceived value, and attainability. – Participation Safety: decision-making, information sharing, interaction and safety. – Support for Innovation: articulated and enhanced support. – Task Orientation: commitment to excellence, appraisal and task orientation.
Theories of leadership[30]	Leading, coaching and managing a team	– Active commitment/participation in performance improvement initiatives. – Setting norms and targets/direction/expectations. – Encouragement and support/motivate staff. – Monitoring performance and feedback.

The identified key elements were used to build our team and leaders-directed strategy that included all components of the state-of-the-art strategy, supplemented with: gaining active commitment and initiative of ward management; modelling by informal leaders at the ward; and setting norms and targets within the team. Before the start of the intervention, all managers participating in the team and leaders-directed group received a four hour training in coaching and motivating the nurses. During the intervention period, the ward manager was assisted by an experienced coach in three team meetings. Also, two group sessions were organized to support the ward managers and to discuss progress and difficulties. Table 3 presents the content and related activities of both strategies.

Table 3 Description of the implementation strategies with the planned activities

State-of-the-art strategy	Team and leaders-directed strategy
Education	**All elements of the state-of-the-art strategy**
Distribution of educational material/ written information (leaflet) about HH that contained:	• Education, reminders, feedback, facilities and products, see above
• The importance of HH	**Setting norms and targets within the team**
• Misconceptions about alcohol-based HH disinfection	• Three interactive team sessions (1 h-1.5 h each) that included goal setting in HH performance at group level. Team sessions were guided by the team manager and a external coach.
• Theory and practical indications for the use of HH	- Exploring nurses' knowledge and perception of current HH behavior (individual- and team level) and discussing actual HH compliance rates
Website www.gewoonhandenenschoon.nl	- Transition from individual responsibility to a shared team responsibility
• Educational material/ written information about HH	- Creating a participatory and non-threatening climate for team interaction
• Knowledge quiz with feedback. Visitors could test their knowledge about HH	- Commitment to high standards of HH performance
• The nursing ward with the highest number of visitors to the website was rewarded	- Defining and documenting improvement activities
Educational sessions on prevention of hospital acquired infections	• Analysis of barriers and facilitators to determine how nurses could best adapt their behavior in order to reach their goal.
• Launching hospital-wide campaign with practical demonstrations of HH	• Nurses address each other in case of undesirable HH behavior
Reminders	**Gaining active commitment and initiative of ward management**
• Distribution of posters that emphasised the importance of HH, particularly alcohol-based hand disinfection. Posters were displayed in several strategic areas within the units and replaced by another poster after 12 weeks.	• Ward manager designated HH as a priority
• Interviews and messages in newsletters or hospital magazines	• Ward manager actively supported team members and informal leaders
• General reminders by opinion leaders/ ward management	• Ward manager discussed HH compliance rates with team members
Feedback	**Modelling by informal leaders at the ward**
• Bar charts of HH rates of every nursing ward were sent to the ward manager twice. This also included a comparison of ward performance and hospital performance	• Informal leaders demonstrated good HH behaviour
Facilities and products	• Informal leaders modelled social skills of team members in addressing HH behavior of colleagues
• Screening and if necessary adapt products and appropriate facilities	• Informal leaders instructed and stimulated their colleagues in providing good HH behavior

Both strategies successfully improved hand hygiene compliance, but the team and leaders-directed strategy showed better results.[24] The findings of this study indicated the

added value of strategy components aimed at social influence within teams and enhanced leadership of ward managers on nurses' HH behavior. However, these results provide no insight into the mechanisms of impact. For instance, the extent to which nursing wards improved their HH compliance varied considerably for both strategies, ranging from −2% to 70% improvement in the long run. In addition, the effect size of the team and leaders-directed group was limited by the intention-to-treat analysis, which is the main statistical approach for RCT analyses. Wards were analyzed according to the group state-of-the-art strategy or team and leaders directed strategy to which they were originally allocated. In the Helping Hands study, thirty nursing wards and their managers were randomly assigned to the team and leaders-directed group but ten wards declined to participate in the team and leaders-directed strategy. Therefore, only twenty wards fully participated in the team and leaders-directed group.

The current article expands on the findings of the Helping Hands study by linking process and effectiveness evaluations. The aim of this paper is to ascertain which components of the two HH improvement strategies can be particularly associated with increased nurses' HH compliance, as well as to explore other possible factors that may be associated with changes in nurses' HH compliance.

We focused on three specific questions:

1. What impact might variation in adherence to the improvement strategies as planned have on changes in nurses' HH compliance?
2. What impact might specific contextual factors as hospital and ward characteristics have on changes in nurses' HH compliance?
3. What impact might differences in nurses' actual experiences with strategy components have on changes in nurses' HH compliance?

Methods

Setting and participants

The Helping Hands study was performed in three hospitals in the Netherlands: two general hospitals and one university medical centre. Within the hospitals, all inpatient nursing wards (n=67) and all affiliated nurses participated in the study. We included surgical wards (n=21), internal medicine wards (n=24), intensive care units (n=13), and pediatric wards (n=9). Twenty wards received the team and leaders-directed group, and 47 wards received the state-of-the-art group. Strategies were delivered during a period of

six months. Follow-up measurements took place directly after strategy delivery (T2) and at six months after the end of strategy delivery (T3).

Measurements and data collection

Data were collected using a wide range of methods, including: student observations, questionnaires to nurses, a ward structure survey, registration of website visitors, structured logbooks of ward managers and coaches and researchers' field notes of group meetings. Using these data sources, we constructed four sets of measures.

Effect evaluation

Effects on nurses' HH compliance

The primary outcome was the percentage of nurses' actions in line with HH guidelines in case of an opportunity to perform this action, according to the HH guidelines of the World Health Organization.[3,31] We monitored nurses' HH compliance unobtrusively during routine patient care before and directly after strategy delivery, as well as six months later.[24]

Process evaluation

Adherence to the improvement strategies as planned

The measurement of adherence captures the following subcategories: content – whether improvement activities were delivered as planned (yes/no); dosage – whether improvement activities were delivered as often and long as planned (yes/no); coverage – the extent to which the intended target group received the improvement activities.[32]

Education was assessed by monitoring the presence of instruction leaflets on the ward and by measuring the number of nurses who completed the knowledge quiz. The use of reminders was checked by measuring the presence of reminders (posters) at random moments during the strategy delivery period. Feedback was assessed by checking the distribution of performance feedback reports to ward managers and by a question from the study's survey asking if nurses had received performance feedback from the ward manager. In addition, the extent to which products and facilities were available in each ward was also explored by survey questions to ward managers and nurses. The attendance of ward management and informal leaders to the training sessions and the support sessions was derived from an attendance checklist. The use of coaching of ward management and informal leaders was assessed by measuring the number of coaching sessions and the total time spent on coaching. Additional details on coaching activities are

available from the authors on request. The use of organized team discussions for norm- and target setting was checked by measuring the number of team discussions performed, the number of nurses attending per ward, the time investment per ward, and whether norms and targets were established. Leadership was assessed by checking documented agreements on the following points: whether the ward manager had discussed HH compliance rates during the team sessions; whether the ward manager had prioritized good HH as a ward target; and whether the ward manager had formulated specific activities to support the team members and informal leaders. Finally, information on whether informal leaders served as role models was derived from group discussion during the support sessions for ward managers and informal leaders.

Contextual factors

We explored the influence of three contextual variables, namely: hospital, ward specialism (e.g., general ward, surgical ward, pediatric ward or critical care ward) and the HH compliance rate at baseline.

Nurses' experiences with specific components of the improvement strategies

In order to explore the relationship between HH outcomes and nurses' actual experiences with different strategy components, we drew on the findings of a 7-subscale questionnaire consisting of 24 items. Each item was a proposition on a specific component of the improvement strategies. These components were education, reminders, feedback, facilities and products, setting norms and targets, social influence and leadership. An example of a proposition that explores nurses' actual experiences with leadership is 'my ward manager holds team members accountable for HH performance'. Nurses scored this proposition on a 4-point Likert scale, ranging from strongly agree (4) to strongly disagree (1). Negatively formulated propositions were recoded. Higher scores indicated more positive experiences with respective components (additional file 1).

Statistical analyses

In this study, our primary research goal was to understand the working mechanisms of HH improvement strategies embedded in the relationship between strategy performance and nurses' HH compliance. Therefore, we combined data from the process evaluations with data from the effect evaluation. To serve our research goal, we moved from the original intention-to-treat analysis to an as-received basis, with 47 wards in the state-of-the-art group and 20 wards in the team and leaders-directed group. Inputs for the effect analysis,

used in this paper, were based on the HH compliance findings of the previously mentioned Helping Hands study. The effectiveness of the Helping Hands study was examined using an 'intention-to-treat' analysis. However, 10 wards declined to participate in the team and leaders-directed group and did not receive any component of this strategy. We therefore explored whether the inclusion, in our intention-to-treat analysis, of wards who did not receive the team and leaders-directed strategy, might have resulted in different effects in changes in nurses' HH compliance. All data were analyzed using SPSS version 19.0 (SPSS, Inc., Chicago, IL) and analyses were performed at ward level.

Effect evaluation

Effects on nurses' HH compliance: intention-to-treat versus as-received analysis

We compared the outcome data on changes in HH compliance of the intention-to-treat analysis (37 wards in the state-of-the-art group and 30 wards in the team and leaders-directed group) with the results of the as-received analysis (47 wards in the state-of-the-art group and 20 wards in the team and leaders-directed group). We used descriptive statistics, including mean and standard deviation, for the change in HH compliance between the measurement points for each of the two strategies. One-way ANOVAs were used to test whether there was a statistically significant difference between the group means for both strategies. A p value of 0.05 or less was considered to indicate the statistical significance of the difference between measurements at baseline (T1), directly after strategy delivery (T2), and at six months after the end of strategy delivery (T3).

Process evaluations linked to effectiveness evaluations

Analysis of adherence to the improvement strategies and related changes in HH compliance

Frequencies and proportions were used to assess the adherence to the several components of the improvement strategies. One-way ANOVAs were used to test the influence from varying strategy components on HH compliance. If a strategy component was significant, correlations between changes in nurses' HH compliance and the significant term were also examined within each strategy group using the Spearman correlation analysis.

Analysis of contextual factors and related changes in HH compliance

One-way ANOVAs were used to test the influence from the contextual factors hospital, ward specialism, and the HH compliance rate at baseline. The correlation between nurses'

HH baseline scores and changes in nurses' HH compliance was tested with the Pearson correlation analysis. Next, we applied forced entry multiple regression analyses to assess the impact of several potential explanatory variables on changes in HH compliance. As an estimation for the explained variance of the model, an adjusted R-Squired was determined.

Analysis of nurses' actual experiences with specific components of the improvement strategies and related changes in HH compliance

Descriptive statistics, including mean and standard deviation, were used to explore differences in nurses' actual experiences with specific strategy components between nurses in the team and leaders-directed group, and in the state-of-the-art group. Inclusion criteria for analysis were wards whose respondents returned ≥ 3 questionnaires. One-way ANOVAs were used to test whether there was a statistically significant difference between group means for both strategies. To determine whether differences in nurses' actual experiences with strategy components predicted variation in HH compliance effects, we tested non-parametric correlations with Spearman analyses between groups and within groups.

Results

General

Initially, 67 wards were included, 30 to the team and leaders-directed group, and 37 to the state-of-the-art group. Ten wards declined to participate in the team and leaders-directed group because of a vacancy for the position of ward manager (2×), reorganization of the ward (2×), workload of the ward manager ruled out other activities (1×), inconvenient timing relating to the execution of the strategy (2×), or other projects were given a higher priority (3×). Finally, 47 wards received only the state-of-the-art strategy, and 20 wards received the team and leaders-directed strategy (table 4). At each point in time, 3,523 to 3,722 opportunities for HH were observed in 886 to 933 nurses. During the entire study, we obtained data on 10,785 opportunities for HH in 2733 nurses.

Table 4 Characteristics of the wards

Ward characteristics	**SAS**[†]	n=47	**TDS**[‡]	n=20
Hospital	University based hospital	n=16	University based hospital	n=9
	General hospital A	n=15	General hospital A	n=5
	General hospital B	n=16	General hospital B	n=6
Specialism	Surgical ward	n=14	Surgical ward	n=7
	Medical ward	n=16	Medical ward	n=8
	Intensive care unit	n=12	Intensive care unit	n=1
	Paediatric ward	n=5	Paediatric ward	n=4

[†]State-of-the-art strategy [‡]Team and leaders-directed strategy

Effect evaluation

Effects on nurses' HH compliance: intention-to-treat versus as-received analysis

Table 5 displays the results of changes in nurses' HH compliance derived from the intention-to-treat analysis and the as-received analysis. In both analyses, the team and leaders-directed group demonstrated better results on HH compliance than the state-of-the-art group. The as-received analysis showed higher effect sizes for the team and leaders-directed group than the intention-to-treat analysis.

Table 5 Changes in HH compliance in participating hospitals during study period

Intention-to-treat analysis	**T1** **baseline**	**T2** **post intervention**	**T3** **follow-up**
Strategy SAS[†]	21.8% (37 wards)	40.4% (37 wards) Δ T1-T2 18.6%	45.9% (37 wards) Δ T1-T3 24.1%
Strategy TDS[‡]	19.1% (30 wards)	53.1% (30 wards) Δ T1-T2 34.0%	52.1% (30 wards) Δ T1-T3 33.0%
Groups compared			
TDS vs. SAS	*f*=0.465	*f*=19.409	*f*=1.781
ANOVA	*p*=0.498	*p*=0.000**	*p*=0.187
As-received analysis	**T1**	**T2**	**T3**
	baseline	post intervention	follow-up
Strategy SAS[†]	21.5% (47 wards)	40.7% (47 wards) Δ T1-T2 19.2%	44.1% (47 wards) Δ T1-T3 22.6%
Strategy TDS[‡]	20.7% (20 wards)	58.6% (20 wards) Δ T1-T2 37.9%	59.5% (20 wards) Δ T1-T3 38.8%
Groups compared			
TDS vs. SAS	*f*=0.001	*f*=40.304	*f*=10.187
ANOVA	*p*=0.978	*p*=0.000**	*p*=0.002**
Groups compared			
SAS groups randomized to TDS (*n*=10) vs SAS groups randomized to SAS (*n*=37) T-test	*p*=0.322	*p*=0.650	*p*=0.224

Compliance with HH prescriptions expressed as a percentage of all relevant opportunities based on the average compliance per ward.

[†]State-of-the-art strategy [‡]Team and leaders-directed strategy *p < .05; **p < .01

A statistically significant (p = 0.002) increase in nurses' HH compliance was observed in the long run (T3) in favor of the team and leaders-directed strategy. The intention-to-treat analysis showed no significant difference in nurses' HH compliance between both strategies at T3.

Process evaluations linked to effectiveness evaluations

Adherence to the improvement strategies and related changes in HH compliance

Both improvement strategies were carried out with good adherence to protocol. Detailed results on strategy adherence are described in additional file 2.

Impact of variation in adherence to the components of the state-of-the-art strategy (n=67)

In the adherence subcategory 'content', we found that the main components of the state-of-the-art strategy were generally delivered as planned. The 'HH promotion event' was not delivered in one hospital. The infection control department of this particular hospital had already organized an HH promotion event one year before the start of our study. Despite the variation in delivering the 'HH promotion event', no effect on changes in HH compliance could be demonstrated (p = 0.384). The subcategory 'coverage' showed some variation in the extent to which washstands were accessible. The analysis showed that variation within these components had no effect on changes in HH compliance (p = 0.348).

The subcategory 'coverage' also demonstrated a significant difference between the number of nurses from wards receiving the state-of-the-art strategy and the number of nurses from wards receiving the team and leaders-directed strategy in completing the knowledge quiz (13% and 37%; p = 0.001). This was positively correlated with changes in HH compliance at both follow-up measurements (T1 to T2: p = 0.019; T1 to T3: p = 0.016) However, completing the knowledge quiz did not predict variation in HH compliance within groups of the state-of-the-art strategy (T1 to T2: p = 0.779; T1 to T3: p = 0.426) or within groups of the team and leaders-directed strategy (T1 to T2: p = 0.354; T1 to T3: p = 0.452).

Impact of variation in adherence to the additional components of the team and leaders-directed strategy (n=20)

In the adherence subcategory 'content', we found that all components of the team and leaders directed strategy were delivered as planned. Components that differed in

adherence across the wards concerned the subcategories 'dose' and 'coverage'. Five wards organized only two team sessions instead of three team sessions. Thus, these wards did not receive a full dose. However, this did not affect the course of nurses' HH compliance (T1 to T2: $p = 0.240$; T1 to T3: $p = 0.254$). Full coverage was also not achieved for attending two sessions in support of the role models and ward managers, but everyone took part in at least one session. Variation in adherence within the component 'support sessions' had no effect on changes in HH compliance (ward managers T1 to T2: $p = 0.262$; T1 to T3: $p = 0.994$; role models T1 to T2: $p = 0.184$; T1 to T3: $p = 0.688$). There was also some variation in the average number of nurses that attended the team sessions, related to total number of nurses employed. However, variation within this component had no effect on changes in HH compliance (T1 to T2: $p = 0.445$; T1 to T3: $p = 0.823$). In conclusion, the evaluation of strategy adherence did not provide any explanatory variables associated with changes in nurses' HH compliance.

Contextual factors and related changes in HH compliance

Our next step was to determine the impact of contextual factors on changes in nurses' HH compliance. Two contextual factors were associated with changes in HH compliance: type of hospital and HH performance at baseline. The ANOVA showed a hospital effect on changes in HH compliance in long term ($p = 0.036$). HH compliance decreased in one hospital in long term, while the HH compliance in the other two hospitals remained stable or increased further. At baseline, the HH scores of all wards from the state-of-the-art strategy and the wards that participated in the team and leaders-directed group were comparable ($p = 0.978$). For both study groups, baseline HH scores were negatively correlated with follow-up scores ($r = -0.693$; $p = 0.000$). Initially, short-term changes in HH compliance (T1 to T2) revealed a specialism effect ($p = 0.002$). In particular, the pediatric wards showed a smaller increase in HH compliance than the wards from other specialisms. However, the baseline HH scores of the pediatric wards were significantly higher than the baseline HH scores of other wards ($p = 0.000$). This alleged specialism effect was, in reality, a baseline effect.

We then tested all significant variables in forced entry multiple regression analyses. Table 6 presents the results from two multiple regression analyses. The basic model included baseline HH compliance (covariate), hospital, specialism and strategy. The first model analyzed changes in HH scores from baseline (T1) to the first follow-up measurement, directly after strategy delivery (T2). Baseline HH scores ($p < 0.01$) and hospital ($p < 0.05$) contributed negatively to short-term changes in HH compliance. The team and leaders-

directed strategy contributed positively to short-term changes in HH compliance ($p < 0.01$). The second model analyzed changes in HH compliance from baseline (T1) to the second follow-up measurement, six months after the end of strategy delivery (T3). Baseline HH scores ($p < 0.01$) and hospital ($p < 0.01$) contributed negatively to long-term changes in HH compliance. The team and leaders-directed strategy contributed positively to long-term changes in HH compliance ($p < 0.01$). The adjusted R2 was 0.702 for the first model and 0.510 for the second model. This suggests that 70% and 51% of the variation in HH change scores could be explained by the regression model.

Table 6 Summary of forced entry multiple regression analysis for variables predicting changes in HH compliance in participating hospitals during study period

	Δ HH compliance T1 to T2			Δ HH compliance T1 to T3		
Variable	B	*SE* B	β	B	*SE* B	β
Constant	27.78	6.32		47.74	7.78	
Baseline T1	-.91	.94	-.80**	-.69	.12	-.64**
Strategy	17.29	2.61	.45**	13.47	3.21	.36**
Hospital	-.3.92	1.66	-.19*	-.12.17	2.03	-.60**
Specialism	.72	1.28	.04	.41	1.60	.03
R^2		.70			.51	
F for change in R^2		39.83**			18.18**	

*p < .05; **p < .01.

Nurses' experiences with the improvement strategies and related changes in HH compliance

In this section, we explored differences in nurses' actual experiences with strategy components and how these differences affected changes in nurses' HH compliance. A total of 528 questionnaires out of 1,100 (369 questionnaires from the state-of-the-art group and 159 from the team and leaders-directed group) were returned, giving a response rate of 48%. Questionnaires of 515 nurses from 59 wards met the inclusion criteria for analysis. Of these, 42 wards belonged to the state-of-the-art group (360 questionnaires), and 17 wards to the team and leaders-directed group (155 questionnaires).

The ANOVA showed significant differences in actual experiences with several items of the questionnaire between nurses from the state-of-the-art group and nurses from the team and leaders-directed group. Nurses from the team and leaders-directed group, who unlike the nurses from the state-of-the-art group were exposed to the strategy components 'setting norms and targets', 'social influence' and 'leadership', experienced more social support ($p = 0.005$), social influence ($p = 0.046$) and leadership ($p = 0.011$)

with respect to HH performance. In addition, these nurses experienced more priority for HH on their ward (p = 0.009) and experienced more feedback about their HH performance (p = 0.000) than did nurses from the state-of-the-art group.

Table 7 displays nurses' experiences with components of both improvement strategies and their impact on changes in HH compliance. First, we examined the impact of strategy components in both study groups (n = 67). In short term (T1 to T2) and in the long run (T1 to T3), changes in nurses' HH compliance were positively correlated with experienced feedback about their HH performance (p < 0.05 and p < 0.01, respectively). In the long run (T1 to T3), two items of the component 'social influence' correlated positively with changes in nurses' HH compliance: addressing each other on undesirable HH behavior (p < 0.01) and support from colleagues in performing HH (p < 0.01).

Table 7 Nurses' experiences with strategy components and correlations with changes in HH compliance

Correlation with changes in HH compliance in all study groups		
Component	Δ T1 to T2	Δ T1 to T3
Proposition	*S* rho (p value)	*S* rho (p value)
Performance feedback		
I do know my ward's HH performance.	.315 (.015*)	.347 (.007**)
Social influence		
My colleagues support each other in performing HH.		.381 (.003**)
Our team members address each other in case of undesirable HH behavior.		.414 (.001**)
Leadership		
My manager pays regular attention to the adherence of HH guidelines.		.293 (.025*)
HH is not a priority at our ward.		.261 (.046*)
My ward manager addresses barriers to enable HH as recommended.		.319 (.014*)
My ward manager holds team members accountable for HH performance.		.382 (.003**)
My ward manager encourages and motivates our team members to perform HH.		.352 (.006**)
Correlation with changes in HH compliance within SAS[†]		
Education		
I know exactly when to perform HH.	-.315 (.042*)	
Leadership		
My ward manager encourages and motivates our team members to perform HH.		.387 (.011*)
My ward manager holds team members accountable for HH performance.		.398 (.009**)
Social influence		.
Our team members address each other in case of undesirable HH behavior.		.347 (.025*)

Correlation with changes in HH compliance within TDS[‡]. No significant correlations between scores on specific items and HH change scores.

[†]State-of-the-art strategy [‡]Team and leaders-directed strategy *p < .05; **p < .01

Also in the long run, five items of the component 'leadership' correlated positively with changes in nurses' HH compliance: regular attention to the adherence of HH guidelines (p < 0.05); designation of HH as ward priority (p < 0.05); addressing barriers to enable HH as

recommended ($p < 0.05$); accountability for HH performance ($p < 0.01$); and encouraging and motivating team members to perform HH ($p < 0.01$).

Within the state-of-the-art group (n=47), we found a few correlations between nurses' experiences with strategy components and changes in HH compliance. In short-term, experienced knowledge of HH indications showed a negative correlation with HH change scores ($p < 0.05$). In the long term, positive correlations with changes in HH compliance could be demonstrated for one item of social influence, namely: addressing each other on undesirable HH behavior ($p < 0.05$). We also found positive correlations with changes in HH compliance for two leadership items: accountability for HH performance ($p < 0.01$) and encouraging and motivating team members to perform HH ($p < 0.05$). We found no significant correlations between scores on specific items and HH change scores within the group of the team and leaders-directed strategy (n=20).

Discussion

In this article, we examined which components of the HH improvement strategies were particularly associated with increased nurses' HH compliance, as well as other possible factors that may have influenced nurses' HH compliance. We therefore linked process and effectiveness evaluations in the analysis of findings from the Helping Hands study[24].

Effect evaluation: intention-to-treat versus as-received analysis

In this article, we have tried to explain the effects of two different HH improvement strategies on changes in nurses' HH. It is important to recognize that this research goal requires a different view on the treatment effects compared to an evaluation of effectiveness. The outcome suggests that the overall conclusions about the effectiveness of the team and leaders-directed strategy arising from the original intention-to-treat analysis may have underestimated the impact and strength of this strategy. The as-received analysis showed higher effect sizes for the team and leaders-directed group than the intention-to-treat analysis on both measurements points. In the long run, we now observed a statistically significant ($p = 0.002$) increase in nurses' HH compliance due to the team and leaders-based strategy. This suggests that the team and leaders-directed strategy might have had a more permanent impact on HH outcomes than shown by the intention-to-treat analysis. This corresponds with the findings of Strange, et al.[36] Their as-received analysis showed higher odds ratios in decreasing risky sexual behavior than the original intention-to-treat analysis, thereby suggesting that their peer-led sex education program, if consistently implemented, probably had a greater impact on study outcomes.

Effects of strategy adherence on nurses' HH compliance

The evaluation of strategy adherence did not provide any explanatory variables associated with changes in nurses' HH compliance. Thus, variation in the HH outcomes across the wards could not be explained by a so-called 'failure of implementation'.[33] Nevertheless, it is noteworthy that more nurses from the team and leaders-directed group completed the knowledge quiz compared to nurses from the state-of-the-art group (37% and 13%, respectively; p = 0.001). A possible explanation is that the team and leaders-directed strategy positively influenced the adherence to specific components of the state-of-the-art strategy.

Effects of contextual factors on nurses' HH compliance

Hospital culture

The as-received analysis showed a hospital effect that was mainly due to one hospital. Especially in the long run, HH compliance started to decrease in this particular hospital, while HH compliance in the other two hospitals remained stable or increased further. Little is known about how hospital cultural factors are associated with the implementation of HH improvement strategies. The WHO,[3] Larson et al.[34] and Pittet[23] emphasize the commitment of high-level administrators to create and support a culture of safety and accountability. Culture manifests itself through the values, beliefs and assumptions embedded in organizations and is reflected in 'the way things are done around here'.[35] The two hospitals that showed sustainability in HH compliance designated HH as a hospital-wide priority. The third hospital was less explicit and distinct in addressing the goal of HH as an organizational priority. This raises the question of whether the observed changes in HH compliance were affected by hospital culture.

Standard care activities

Although the average HH baseline scores of the wards were comparable between wards from both groups, our analysis showed that a high baseline HH compliance was associated with a smaller effect of both HH improvement strategies. High HH compliance at baseline was particularly seen in the pediatric wards. Wagner and Kanouse[36] have pointed out that standard care activities may affect adherence behaviors and thus intervention outcomes. It is possible that certain components of our improvement strategies are already part of daily practice in some wards and therefore leave less room for improvement. Despite the influence of baseline scores and hospital effect, the team

and leaders-directed strategy significantly contributed to an additional increase in nurses' HH compliance, both short and long term.

Effects of experiences with the improvement strategies on nurses' HH compliance

The exploration of the relation between determinants of success and HH compliance provided empirical evidence or performance feedback, social influence and leadership as important vehicles for changing HH behavior. It seems likely that the mixture of these strategy components affect the teams' abilities to focus on achieving their HH improvement goals. Our results have strengthened the theoretical underpinning of the composition of our team and leaders-directed strategy by using a team approach for changing individual behavior. By setting clear norms and targets within the team, individual team members are invited to support each other in achieving this goal.

Speak up

The findings of our study also show that it is important to promote a team culture that empowers team members to speak up when non-adherence is observed. In this finding, we recognize key elements from the social influence theory[27] (e.g., team members address each other in case of undesirable behavior), and the theory on team effectiveness[28,29] (e.g., participation safety and task orientation) (table 2). This is of particular interest because 'speak up' is positively correlated with improved HH behavior. During the team sessions, we taught the nurses to provide feedback on the HH behavior of their colleagues in a correct way. At the same time, we guided the nurses to receive this feedback positively.

Active commitment and initiative from ward management

The results of our study show that specific components of leadership are positively correlated with an improvement in nurses' HH compliance. Thus, ward managers should address barriers to enable HH as recommended, designate HH as a ward priority, motivate and encourage team members to perform HH, and hold team members accountable for their HH behavior. This finding corresponds with the key elements from theory of leadership[30] as displayed in table 2.

Credits of our findings are not entirely due to the delivery of the team and leaders-directed strategy. Nurses from the state-of-the-art group were not exposed to social influence and leadership as a result of improvement activities from our study. A possible explanation is that these wards, independent of our study activities, have given priority to

HH and were motivated and encouraged by their managers. This explanation is supported by the results of a further analysis within the group of the state-of-the-art strategy. We found a significant relation between changes in HH compliance and differences in nurses' experiences with social influence and leadership. Compared to the state-of-the-art group, the analysis within the group of the team and leaders-directed strategy showed less variation in changes of nurses' HH compliance. Therefore, an association between changes in HH compliance and differences in nurses' perceptions of strategy components within the team and leaders-directed group could not be demonstrated. We hypothesize that the lack of variation in this group is due to the consistent implementation of the team and leaders directed strategy. As already shown by our evaluation of strategy adherence, all nurses within the group of the team and leaders-directed strategy were equally exposed to the main components of this strategy.

Strengths and limitations

The principal strength of our study was the comprehensive process evaluation within the context of a pragmatic randomized controlled trial. Questions about variations in the adherence to both HH strategies, and about factors contributing to the relationship between the HH improvement strategies and nurses' HH outcomes, would not have been apparent as a result of only analyzing the HH outcome data. Process evaluations are, in this sense, part of a more theory-based approach to evaluation, responding to the need to understand which theoretical constructs of an improvement strategy make a difference.[37] By linking data of effectiveness to process data, a theoretical explanatory model can be derived from the process evaluation itself.[36]

Some researchers encourage the simultaneous application of a process evaluation in control groups.[5,38] By doing so, we discovered the impact of specific aspects of social influence and leadership in the state-of-the-art group that served as a control group. This finding has strengthened the theoretical underpinning of the composition of our team and leaders-directed strategy.

In combining process with outcome evaluations, we collected data using a wide range of methods as recommended by several authors.[5,15] We developed a questionnaire, derived from the components of the improvement strategies. We undertook extensive pilot work to ensure that all important components of the strategies were adequately captured in questionnaire measures. We then pre-tested the questionnaire among 90 nursing students.

An important issue concerns the use of 'as-received' analysis as distinct from the conventional 'intention-to-treat' analysis used in the analysis of RCTs. These analyses differ not only in terms of the estimation procedure, but also in terms of the underlying research goal for a specific study. This study is an example of explanatory research, and the as-received analysis was therefore appropriate. Our as-received analysis was illuminating but also lost the benefits of the original random assignment, and therefore the potential for bias exists. This should be considered when interpreting our results.[39]
A limitation of our study concerns the low questionnaire response rate of 48%. This may be a potential source of bias. We didn't test the psychometric properties of the questionnaire. For these reasons, our findings from the nurses' experiences analysis need to be interpreted with caution.

Implications

This is the first prospective study that has assessed the working mechanisms of two HH improvement strategies, demonstrating the added value of specific aspects of social influence and leadership. This is an important finding for hospital administrators and ward managers who want to improve nurses' HH behavior. Currently, most strategies focus on the individual and the organization. Including activities aimed at social influence and leadership could be a promising development. Our results point to: addressing each other in case of undesirable behavior, support from colleagues, accountability, goal setting, and active commitment of the ward manager. The methodology of our team and leaders-directed strategy can probably be used to improve team performance on other patient safety issues as well.
Our study points to ways in which the design of process evaluations within randomized controlled trials may be conducted. Our initial results require affirmation by further process evaluations of HH improvement strategies. Further research is also needed to examine the different aspects and impact of social influence and leadership. Finally, future research should explore the influence of hospital culture.

Conclusion

In summary, with this study we were able to look inside the 'black box' of two HH improvement strategies, to generate insights into which strategy components are effective. Our results support the added value of social influence and enhanced leadership in HH improvement strategies, thus offering an interpretation of the trial effects. Our findings point to: addressing each other in case of undesirable HH behavior,

support from colleagues, accountability, goal setting, and active commitment of the ward manager. These results have strengthened the theoretical underpinning of the composition of our team and leaders-directed strategy. Our study also points to ways in which the design of process evaluations within randomized controlled trials may be conducted.

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Additional file 1 Questionnaire on nurses experiences with strategy components

	Agree		Disagree	
When I am wearing gloves, I don't have to perform hand hygiene	☐	☐	☐	☐
Sinks are awkwardly placed at my ward	☐	☐	☐	☐
My colleagues think that the hand hygiene prescriptions do not always need to be followed	☐	☐	☐	☐
At my ward alcohol-based hand rub is in the immediate vicinity (<1 meter) at the point of care	☐	☐	☐	☐
Hand hygiene during procedures with low risk of contamination is of less importance	☐	☐	☐	☐
Other patient safety issues are more important than hand hygiene	☐	☐	☐	☐
It often happens that soap / hand alcohol / towels or disposable gloves are not available	☐	☐	☐	☐
My colleagues support each other in performing hand hygiene	☐	☐	☐	☐
Not performing hand hygiene could have (severe) implications for the patient	☐	☐	☐	☐
My manager pays regular attention to the adherence of hand hygiene guidelines	☐	☐	☐	☐
I regularly forget to perform hand hygiene	☐	☐	☐	☐
Hand hygiene is not a priority at our ward	☐	☐	☐	☐
My ward manager sets norms and targets for HH adherence	☐	☐	☐	☐
My ward manager encourages and motivates our team members to perform hand hygiene	☐	☐	☐	☐
Our team members address each other in case of undesirable hand hygiene behaviour	☐	☐	☐	☐
I know the content of the hand hygiene guidelines	☐	☐	☐	☐
I know exactly when to perform hand hygiene	☐	☐	☐	☐
It's important to perform hand hygiene during procedures with high risk of contamination	☐	☐	☐	☐
I know exactly how to perform hand hygiene	☐	☐	☐	☐
Infection prevention is an important topic on my ward	☐	☐	☐	☐
I do know my wards hand hygiene performance	☐	☐	☐	☐
My ward manager provides resources to enable hand hygiene as recommended	☐	☐	☐	☐
My ward manager addresses barriers to enable hand hygiene as recommended	☐	☐	☐	☐
My ward manager holds team members accountable for hand hygiene performance	☐	☐	☐	☐

Additional file 2 Adherence of nursing wards to strategy components

State-of-the-art group *n*=47		
Component	***Improvement activities***	***Adherence***
Education	Presence educational website and knowledge quiz (*content)*	100%
	Participation in knowledge quiz (*coverage)*	11%
	Presence of leaflets (*content)*	100%
	HH promotion event (*content)*	68%
Reminders	Three newsletters to ward manager (*content)*	100%
	Publication in hospital magazine (*content)*	100%
	Distribution of hand hygiene posters twice (*content)*	100%
	Presence of hand hygiene posters on the wards *(coverage)*	100%
Performance feedback	Distribution performance feedback reports to ward manager twice (*content)*	100%
Facilities and products	Presence of hand hygiene products (*content)*	100%
	Acceptable access to washstands / hand rub *(coverage)*	45%
Team and leaders-directed group *n*=20		
Component	***Improvement activities***	***Adherence***
Education	Presence educational website and knowledge quiz (*content)*	100%
	Participation in knowledge quiz (*coverage)*	37%
	Presence of leaflets (*content)*	100%
	HH promotion event (*content)*	75%
Reminders	Three newsletters to ward manager (*content)*	100%
	Publication in hospital magazine (*content)*	100%
	Distribution of hand hygiene posters twice (*content)*	100%
	Presence of hand hygiene posters on the wards *(coverage)*	100%
Performance feedback	Distribution performance feedback reports to ward manager twice (*content)*	100%
Facilities and products	Presence of hand hygiene products (*content)*	100%
	Acceptable access to washstands / hand rub *(coverage)*	40%

Setting norms and targets	Team discussion organised (*content)*	100%
	Number of team discussions *(dosage)*	92%
	Nurses' participation in team discussions *(coverage)*	50%
	Time spent on team discussions (*dosage)*	90%
	Topics Goal setting in hand hygiene performance *(content)*	100%
	Analysis of barriers and formulating improvement activities *(content)*	100%
	Norms and targets established *(coverage)*	100%
Social influence	Nurses address each other in case of undesirable hand hygiene behavior *(content)*	100%
Leadership	Ward manager discusses hand hygiene compliance rates with team members *(content)*	95%
	Ward manager designates hand hygiene as a priority *(content)*	95%
	Ward manager actively supports team members and informal leaders *(content)*	95%
Modelling	Informal leaders model social skills of team members in addressing hand hygiene behavior of colleagues *(content)*	90%
	Informal leaders demonstrate good hand hygiene behavior *(content)*	90%
	Informal leaders instructs and stimulates colleagues in providing good hand hygiene behavior *(content)*	90%

Chapter 8

General discussion

General

Implementing Evidence-Based Practice (EBP) in nursing is a complex and slowly evolving process, resulting in practices that are incongruent with protocols, guidelines, procedures or regulatory requirements. This could create a potentially harmful situation for patients.[1] The social context in which nurses operate can enhance the implementation of Evidence-Based Practice,[2] thereby bridging the gap between evidence and practice. In this thesis we investigated the roles and activities of three elements of the social context: Professional Nurses' Associations, Nurse Opinion leaders, and Nursing teams.

In this chapter we present the main findings of the studies, followed by the discussion of these findings. Subsequently, we discuss some methodological considerations and provide an overall conclusion. We conclude this chapter with implications for future research and practice.

Main findings

We first explored the role of **Professional nurses' associations** in the promotion of Evidence-Based Practice. Professional nurses' associations are in a unique position to endorse Evidence-Based Practice and guide their members to contribute to the delivery of high-quality care.[3,4] They form part of the professional network of nurses and focus on professional development and the promotion of professional behavior.[5] We found that nurses' associations worldwide are motivated to play a key role in the promotion of Evidence-Based Practice. Most of their activities were predominantly focused on the intrinsic motivation of nurses and aimed at nurses' competences and attitudes in relation to Evidence-Based Practice (*chapter 2)*. Dutch nurses' associations perceived the selection and distribution of evidence to be their primary role in the implementation of Evidence-Based Practice, but they did not think they should play a large role in the generation and implementation of evidence (*chapter 3).*

Subsequently, we explored the role of **Nurse opinion leaders** in the implementation of Evidence-Based Practice to improve our understanding of competencies necessary to perform this role properly. We found that a wide palette of competencies is needed (*chapter 4*). We also found that nurses and their managers prioritize the competencies required differently. Nurses especially appreciate people-oriented competencies that are affiliated with leadership (cooperation, communication, delegating, feedback, and

networking). Managers value task-oriented competencies concerning policy and daily practice (project management and bedside teaching).

Finally, we explored the role of **Nursing Teams** in the promotion of Evidence-Based Practice. We identified literature on the characteristics of a successful team and successful team-directed strategies in nursing (*Chapter 5*). Subsequently, we studied the usefulness of an instrument that measures 'team climate', the Team Climate Inventory (TCI) *(chapter 6*), and we studied the successful components of a team-and leaders directed strategy in a process evaluation *(chapter 7)*. We identified relevant team characteristics that point to the six features of a successful nursing team: communication, clear purpose, team member attributes, trust and confidence, leadership and roles and responsibilities. We found team-directed strategies that mainly focused on educational and facilitating methods that were generally combined into integrated strategies. Yet, evidence for these factors and strategies was found to be very limited (*chapter 5*). In our TCI validation study we were neither able to support the criterion-related validity, nor the responsiveness of the TCI in relation to process indicators for quality of care. The TCI did not demonstrate significant correlations with preventive nursing care, and changes in TCI scores did not correlate with changes in preventive nursing care. TCI scores also did not respond to an implementation strategy aimed at influencing team climate (*chapter 6).* The study results from the process evaluation, embedded in a trial on promoting hand hygiene, demonstrated the added value of addressing social influence and leadership in teams, so as to improve performance in the care process (*chapter 7).*

Discussion of main findings

Professional nurses' associations

Our findings suggest that Professional nurses' associations still have a long way to go to gain a leading role in the implementation of Evidence-Based Practice.[6] However, they are motivated to contribute to Evidence-Based Practice and to address associated challenges as they move ahead. The question remains how to proceed from the situation of a rather premature EBP promotion status and an increasing attention for EBP in publications, to a leading role in the implementation of Evidence Based Practice? In the Netherlands, the Dutch nurses' association (V&VN) is the authoritative association for nurses and caregivers. The association fully supports excellent nursing practice and promotes the individual and collective interests of professionals.[7] Their strategic document describes the management of relevant databases and unlocking research and guidelines for their

members as examples of their role in maintaining professional standards.[7] Unfortunately, much of the association's attention and energy is still necessarily focused on the nurses' associations joining forces, and the consolidation of the position of nurses in the Netherlands, rather than on Evidence-Based Practice activities. Another Dutch nurses' association (NU'91) collaborates with the International Council of Nurses (ICN), and also intends to promote evidence-based practice among their members. Their theme of the 2012 International Nursing Day was: 'closing the gap: from evidence to action'.[8] The campaign focused on increasing awareness on the important role nurses play in the process of evidence to action.

A recent study confirms the importance of the role of nurses' associations in the implementation of Evidence-Based Practice.[5] Not only in the distribution of information, but particularly in taking a leading role in two key Evidence-Based Practice activities: 1. development of evidence-based syntheses, systematic reviews and guidelines; and 2. development, implementation and testing of conditions necessary for the implementation of Evidence-Based Practice. However, there are challenges that need to be addressed, such as the extensive time needed for members and staff to search, find, criticize, summarize and synthesize EBP resources; limited knowledge and experience of members in analyzing and synthesizing research; establishing and implementing a system for keeping EBP resources up to date and the limited availability of evidence for nursing interventions for specific patient problems.[5]

Nurse opinion leaders

Using nurse opinion leaders to promote Evidence-Based Practice means that a significant investment is needed to prepare and support nurses with an implementation assignment to take up this challenging role and to allow this function to be properly executed.[9] Nurses and their managers have different expectations of the execution of this role and they interpret it differently. We think that communication and alignment on the interpretation of the role at the start of an implementation project is therefore necessary to prevent potential problems. Recent findings confirm our results that a bachelor or even a master's qualification (or its equivalent) is required for opinion leaders.[10] This is also in line with the observation that the professional behavior of nurses with a master's degree was more evidence-based than the professional behavior of those without a master's degree.[11] Likewise, clinical credibility and advanced clinical skills are necessary to get the message across and these depend on an in-depth knowledge of the specialty.[10,12] Opinion leaders represent the social norms within the network.[2] This was confirmed by Erasmus

et al.[13] in their study on hand hygiene. They found that social norms were associated with hand hygiene compliance by nurses and that nurses were influenced by the opinions on hand hygiene of important others. Other studies on hand hygiene compliance[14] and use of a delirium assessment tool[15] confirm the importance of a nurse opinion leader as well. Operating as an opinion leader who stimulates Evidence-Based Practice is a challenging and multifaceted role, demanding a wide range of competencies that need to be facilitated.

Nursing teams

We succeeded in locating team attributes of nursing teams that are associated with the implementation of Evidence-Based innovations and that are also in line with successful team attributes, as described by Kranz and Forsyth (*chapter 5).* Leadership was found most often as a team attribute, and also as an effective team strategy after feedback. Attention and involvement of leadership in implementation projects is essential, which was also confirmed in the study on the effectiveness of a team and leaders-directed strategy.[16] Apparently, health care providers and nurses in particular need the explicit support of a leader when implementing Evidence-Based innovations.

Measuring a team attribute (team climate) in nursing teams in relation to quality of care proved to be rather a challenge (*chapter 6).* Whether the disappointing outcomes of our validation study of the TCI are the result of the (limited) sensitivity of the TCI or of other influencing factors needs to be studied more extensively. It is, for instance, not clear whether and how organizational factors influence the team climate and whether there are other modifiable factors that predict a better team climate in nursing teams.[17] In our study on hand hygiene compliance, we used nursing teams that participated in a trial to study the effects of campaigns designed to increase the hand hygiene compliance rate (Helping Hands).[18] We did not find a significant change in the TCI scores after the implementation of a team- directed implementation strategy (TDS). However, the TDS did lead to significantly better hand hygiene compliance.[16] A possible explanation for the improved compliance rate in the Helping Hands trial might be that the TDS did affect other aspects of team work which could not be measured with the TCI. Based on these results we questioned whether the TCI is a good instrument to measure team climate in health care processes. Uncertainty remains about valid measuring tools to determine teamwork-related attributes in relation to quality of care. In the meantime investments in optimizing health care teamwork have increased in quality and safety care. Teams have increasingly become a way of life in many organizations. Consequently, evidence

regarding the effectiveness of teamwork-oriented interventions has grown rapidly. It would appear that better measurement remains an issue.[19,20] There is a need for more robust, reliable, valid, and diagnostic measurement approaches. For example real-time outcomes of team performance that can be implemented and measured. Our results were supported by a study that also used a self-assessment measurement of healthcare workers' perceptions in a general practice. In this study, a questionnaire was used to reflect the team's perceptions of patient safety climate. The results of the patient safety climate scores were used to assess cultural change in teams as a result of team-directed interventions to improve quality and safety of care.[21] But here the results of the perceived safety climate scores did not change either after a specific team-directed intervention. Nevertheless, better reporting of patient safety incidents was observed in the intervention practices, as shown by more reports and reports of higher quality than in the control practices.[21] Yet to date, no widely accepted and validated method for the measurement of team climate to enhance the quality and safety of care has been found.
In our study on the effectiveness of an implementation strategy the activities aimed at social influence and leadership, as in the team and leaders-directed strategy in the Helping Hands study, turned out to be effective.[16] Most effective were the activities in which nurses addressed and supported each other in case of undesirable hand hygiene behavior. In this study, the ward manager was assisted by a coach who was specifically trained to teach team members to address each other and speak up when non-adherence was observed. Apparently teams need support in addressing each other in relation to desired and undesired behavior, as well as in creating and supporting a team culture of safety and accountability.

Methodological considerations

We applied and combined several research methodologies in order to study three aspects of the social context. Here, we summarize some general methodological considerations related to the designs.

Valid outcomes of reviews

Our literature reviews (*chapters 2 and 5)* identified the state of the art of two aspects of the social context in the promotion of Evidence-Based Practice in nursing. Our literature reviews are systematic and comprehensive. Yet both reviews yielded few studies, with little evidence. This would imply that the findings from both reviews should be interpreted with some caution. The review on the promotion of evidence-based practice

by professional nursing associations was performed several years ago (2005). A new, recent search (2013), using the same key words as well as inclusion and exclusion criteria, yielded one additional article.[5] This article confirms the importance of the role of nurses' associations and encourages nurses' associations to undertake activities, thereby implying that the results of our study on the promotion of Evidence-Based Practice by nurses' associations in today's context are still valid.

Validity of process indicators

In the Safe or Sorry and Helping Hands trials, clinical process indicators were used to measure quality improvement. We also used these clinical process indicators in our study *(chapter 6)* to assess the criterion validity of the TCI. Ideally, validated process indicators should have been used, but they were only available in the Helping Hands study and not in the Safe or Sorry trial. In both studies no correlations were found between the TCI scores for the participating nursing teams and these indicators. Whereas uncertainty about the indicators in the Safe or Sorry trial implies that we should be cautious with firm conclusions, we do believe the lack of correlations in the Helping Hands trial pleads against the validity of the TCI.

Embedding a study in a CRCT

Two of our studies were embedded in cluster randomized controlled trials (CRCTs), namely the correlational study in chapter 5 and the process evaluation in chapter 7. The advantage of embedding an extra study in a CRCT is that this is economical, i.e. the results for two studies are achieved with one project. A disadvantage of this is that this increases the effort required from the participants, moreover the usefulness of the extra questionnaires or measures may not be obvious to the participants. Indeed, this is what appears to have happened in the studies in chapters 5 and 7. Response rates for the questionnaires for the embedded studies were relatively low and investigators reported that some of the participants enquired after the relevance of these questionnaires. This resulted in a lower power for these two studies and may potentially have resulted in selection bias, i.e. only motivated participants may have completed the questionnaires.

Implications for future practice

The findings of this thesis demonstrate the added value of addressing the social context in the implementation of Evidence-Based Practice in nursing. Based on the results of our studies we have formulated the following recommendations:

Join forces

Considering the size of the task and the associated challenges, we think that collaboration between nurses' associations nationally and internationally is necessary to accelerate the implementation of Evidence-Based Practice. By bundling their expertise and learning from each other's experiences, nurses' associations can become more efficient and productive.[22] In addition, better co-operation between specialized nurses' organizations, their medical counterparts, patient organizations, the national health inspection, research institutes and nursing schools will accelerate the implementation of Evidence-Based Practice as well. Mutual collaboration and bundling activities with counterparts and stakeholders can accelerate the promotion of Evidence-Based Practice. This will help to make the transition from experience and common sense based care to evidence-based care.

Implementation

Several initiatives have been undertaken since the results of our nurse opinion leader study. The Dutch nurses' association, V&VN, adopted our 'implementation coach' training programme[23] and applied it to train nurses in the implementation of guidelines. One of the projects concerned the implementation of guidelines to prevent hospital-acquired infections. Twenty-six nurses of eight different hospitals finished the training program, in which they were trained in the necessary skills and competences to coach their team during this implementation process.[24] In this project the training program contributed to a successful improvement of guideline adherence. We recommend that the Dutch nurses' association disseminates and implements this program more extensively, and further adds to the evaluation of its effects.

Awareness of team effectiveness

We advise both team managers and team members to analyze the context of their current practice, i.e. team processes and team norms. This will create an environment that strengthens Evidence-Based Practice. Team managers and nurses should be aware that teams contribute to team effectiveness in the same way that individuals contribute to individual effectiveness.[19]

Implications for future research

The studies in this thesis were among the first to explore the promotion of Evidence-Based Nursing Practice, using the social context in nursing. Although important steps have been taken, a number of implications for future research arise from our findings.

From determination to action phase

Further empirical research is needed on barriers and facilitators for nurses' associations, nurse opinion leaders and nursing teams in the implementation of Evidence-Based Practice. Also, the following specific questions need to be addressed:

- How do nurses' associations, being champions in the promotion of Evidence-Based Practice, successfully disseminate their activities?
- Which methods, applied by the opinion leader, are successful when facilitating the implementation of Evidence-Based Practice?
- What are the effective elements of a team culture that promote the implementation of Evidence-Based Practice in nursing teams?

Study rigor

Future methodologically robust research is required using controlled designs, with combined process, outcome and impact evaluation 1) to measure the effect of factors such as the context in which nurse opinion leaders and teams operate and 2) to optimize methods for identifying opinion leaders and effective teams and their activities. This will contribute to the knowledge on the effectiveness of the opinion leader and nursing teams[25] in the promotion of Evidence-Based Practice, and it will address important areas such as leadership training and team training in clinical nursing.

Teamwork in relation to quality of care

There is a need for research, using different instruments and different attributes of teamwork to measure and clarify the relationship between teamwork and quality of care using different outcome measures. Future research is also required to determine the feasibility of measuring team climate as a separate attribute of teamwork.

Final conclusion

This thesis has added to the insight on bridging the gap between evidence and practice in nursing, especially with a view to the role of the social context. The research contributes to the body of knowledge of implementation science exploring and demonstrating the

added value of specific aspects of social influence. Nurses' associations, opinion leaders and teams are all important aspects of the context in which nursing care is delivered. Addressing each of these can help to bridge the gap between research and practice, although evidence in this area is still limited. The results of these studies are promising for the future, because they allow research and practice to more deliberately focus on aspects of social influence. Since this is the first series of studies investigating the roles of the social context in nursing when implementing Evidence-Based Practice, more research is necessary to underline the results of this study and to take these further.

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Summary

Over the last decades, nurses in clinical practice have been increasingly challenged by the expectations of patients and health care organizations to provide care of the highest quality, based on scientific evidence. In spite of a growing body of evidence in nursing care, implementation of this evidence is still sub-optimal. In current nursing practice, the majority of implementation activities are either targeted at individual professionals (individual level) or at the structural work context (organizational level). However, success in achieving change is also influenced by the social context of the change process; therefore exploring the social context of nurses was expected to yield results that can be used to enhance Evidence-Based Practice in nursing, resulting in better quality of care.
This thesis addresses elements in the social context of nurses in view of the implementation of Evidence-Based Practice. The main focus of the thesis is on the roles of professional nurses' associations (chapter 2 & 3), nurse opinion leaders (chapter 4) and of nursing teams (chapter 5-7).

Professional Nurses' Associations

In two studies, we investigated the role and activities of professional nurses' associations in the promotion of Evidence-Based Practice (EBP). In **chapter two** we describe a literature review on activities performed by professional nursing associations when promoting Evidence-Based Practice among their members. We found sixty nurses' associations performing a total of 179 different activities to promote Evidence-Based Practice. These activities included the publication of research reports in journals, organizing EBP conferences or working groups and involvement in research. We classified these activities on a continuum with approaches of an either involuntary (laws, regulations) or voluntary manner. We found that professional organizations did not propose involuntary approaches. Furthermore, 132 out of the 179 types of identified activities focused on intrinsic motivation, whereby 103 out of these 132 activities focused on intrinsic motivation were directed at training competences and attitudes. This review showed that traditional training still dominated many projects, leaving other types of activities relatively underused.

In **chapter three** a cross-sectional, descriptive survey is described that explores the perception of Dutch nurses' associations on their roles and engagement in the promotion of Evidence-Based Practice. Interviews were conducted with 43 key informants of professional nurses' associations. These interviews were complemented with an analysis of the associations' policy reports and other publications. The key informants thought

their associations primarily played various roles in the selection and distribution of evidence: the roles of participant (n=13) and performer (n=13) in selecting evidence, and those of facilitator (n=12) and initiator (n=15) in the distribution of evidence. Nearly all organizations (n=41) thought that they themselves should distribute relevant evidence to their members. Nine respondents considered roles in generating evidence and implementing Evidence-Based Practice in patient care. The contemplation and pre-contemplation stages were the dominant criteria for the Evidence-Based Practice promotion status of the organizations in all the aspects studied (knowledge, perspective, motivation, policy, curricular impact and communication). Although many associations expressed a motivation to contribute to Evidence-Based Practice, the majority of the professional nurses' associations are only gradually starting to really contribute.

Nurse opinion leaders

The second part of this thesis investigated the role of opinion leaders in the promotion of Evidence-Based Practice in nursing. In **chapter four** we explored competences of nurse opinion leaders. In this exploratory study, we also developed, executed and evaluated a supportive training program (I-coach program). We used a systematic, programmatic and stepwise approach to train nurses in implementation skills. The training was combined with one-on-one coaching, in which the subject of personal growth was also addressed. Eight nurse specialists, who were implementing nursing guidelines at the time, completed the one-year training program and were the subjects of analysis in this study. Several instruments were used to inventory and identify specific characteristics and competences of the nurse opinion leader. Twenty-one competences were identified, the most important of which were: cooperating, communicating, delegating, giving feedback, networking and information processing. Competences that are affiliated with leadership were mentioned as necessary in the experience of the nurses. Managers indicated competences concerning policy and daily practice (project management and bedside teaching) as necessary. The number of competences identified in this study also served to emphasize the complexity of the role of a nurse opinion leader with an implementation assignment.

Nursing teams

The third part of this thesis is based on the presupposition that team functioning is relevant to the quality of care. However, insight into relevant team attributes and into team-directed interventions influencing team functioning is lacking. Since teams are

natural components of nursing units, we decided to search the literature for evidence on team characteristics and team strategies that facilitates a successful introduction of innovation in nursing, on which we report in **chapter five.** The literature search resulted in nine articles meeting our inclusion criteria, though with little evidence. We identified fifteen different team attributes that could be labeled with six features of successful teams (communication, clear purpose, team member attributes, trust and confidence, leadership and roles, and clear responsibilities). Additionally, we identified twenty-one different team-directed strategies which mainly focused on education, monitoring, feedback and leadership and were often combined into integrated strategies. Feedback was most frequently used as a strategy, whereas leadership could be labeled as a team attribute as well as a strategy. Team climate was considered an important team factor that could be measured with the Team Climate Inventory (TCI). We concluded that although relevant team attributes and team-directed strategies had indeed been described, this was only done so in relatively few studies.

In **chapter six** we evaluated the criterion-related validity and responsiveness of the Team Climate Inventory (TCI), in relation to process indicators of quality of care. In this exploratory correlational study, we used data on guideline implementation of 42 Dutch nursing teams from two trials (Safe or Sorry trial and Helping Hands trial). Results demonstrated that expected relations between team climate and guideline adherence compliance were not statistically significant. Additionally, the TCI scores did not respond to an implementation strategy specifically aimed at influencing team climate. Therefore, we could not confirm either the criterion-related validity or the responsiveness of the TCI in this study. These findings raise the question whether team climate in relation to health care processes can be measured with the TCI. Further studies, using different instruments, are needed to arrive at valid team climate assessments and to measure the relationship between team climate and quality of care.

In **chapter seven** we performed a process evaluation to evaluate a team and leaders-directed strategy aimed at addressing barriers at team-level, by focusing on social influence within teams, targeting the social context in which the implementation of interventions took place. We found that one item of the component 'social influence' (i.e., addressing each other on undesirable hand hygiene behavior $p<0.01$), and one item of the component 'leadership' (i.e., ward manager holds team members accountable for hand hygiene performance $p<0.01$) correlated positively with behavior changes of nurses in the

long run. This study demonstrates the added value of specific aspects of social influence as part of a team and leaders-directed implementation strategy, when implementing an intervention based on Evidence-Based care in nursing. Nurses experienced more social support, more social influence and leadership, more priority given to the implementation of the intervention and more feedback on their performance regarding hand hygiene behavior.

In the final **chapter eight,** we summarized our findings and discussed the results of this thesis. Furthermore, we elaborated on the clinical consequences of our results and suggested aims for future research.

Samenvatting

In de afgelopen decennia zijn verpleegkundigen in toenemende mate uitgedaagd tot het leveren van zorg die gebaseerd is op wetenschappelijk bewijs. Ondanks een groeiende hoeveelheid bewijsmateriaal in de verpleegkundige zorg, is de toepassing van dit bewijs niet optimaal. In de huidige verpleegkundige praktijk richten implementatie activiteiten zich voornamelijk op de individuele professional of op het niveau van de organisatie. Echter, het bereiken van een succesvolle verandering wordt ook beïnvloed door de sociale context waarbinnen het veranderingsproces zich voltrekt, daarvoor is er minder aandacht. Door het verkennen van de sociale context in de verpleegkundige praktijk verwachtten we resultaten te genereren die het toepassen van Evidence-Based Practice in de verpleegkunde kunnen verbeteren en daardoor de kwaliteit van zorg.
Dit proefschrift richt zich op elementen van de sociale context van verpleegkundigen in relatie tot de implementatie van Evidence-Based Practice. In dit proefschrift worden de rollen van verpleegkundige beroepsorganisaties (hoofdstuk 2 en 3), verpleegkundige opinion leaders (hoofdstuk 4) en verpleegkundige teams (hoofdstuk 5-7) verkend.

Verpleegkundige beroepsorganisaties

In twee studies onderzochten we de rol en activiteiten van verpleegkundige beroepsorganisaties bij de promotie van Evidence-Based Practice.
In **hoofdstuk 2** beschrijven we de resultaten van een literatuurstudie over de uitgevoerde activiteiten door verpleegkundige beroepsorganisaties bij het bevorderen van Evidence-Based Practice onder hun leden. We vonden zestig organisaties die in totaal 179 implementatie activiteiten uitvoerden. Deze activiteiten omvatten het publiceren van onderzoeksrapporten in tijdschriften, het organiseren van EBP conferenties of werkgroepen en participatie bij onderzoek. We hebben deze activiteiten uitgezet op een schaal van onvrijwillige tot vrijwillige benaderingen. We vonden geen onvrijwillige benaderingen. Bovendien vonden we dat 132 van de 179 geïdentificeerde activiteiten gericht waren op intrinsieke motivatie. 103 van deze 132 activiteiten richtten zich voornamelijk op het versterken van competenties en attitudes. Uit deze inventarisatie blijkt dat de activiteiten die beroepsorganisaties toepassen bij het stimuleren van Evidence-Based Practice gedomineerd worden door traditionele activiteiten zoals scholing, terwijl andere soorten activiteiten relatief onbenut blijven.

In **hoofdstuk 3** wordt in een cross-sectioneel, beschrijvend onderzoek uitgewerkt hoe Nederlandse verpleegkundige beroepsorganisaties hun rol en betrokkenheid bij de bevordering van Evidence-Based Practice zien. Hiervoor werden interviews met 43

sleutelfiguren van deze beroepsorganisaties gehouden. Deze interviews zijn aangevuld met een analyse van beleidsverslagen en andere relevante publicaties van de organisaties. De geïnterviewden gaven aan dat hun organisaties diverse rollen speelden in de selectie en distributie van wetenschappelijk bewijs. Negen respondenten beschouwden de rol van hun organisatie als het genereren van bewijs en implementeren van Evidence-Based Practice in de patiëntenzorg. Bijna alle organisaties gaven aan gemotiveerd te zijn om bij te dragen aan Evidence-Based Practice. Veel organisaties oriënteerden zich echter nog op hun rol en we ontdekten nog weinig concrete bijdragen.

Verpleegkundige Opinion leaders

Het tweede deel van dit proefschrift beschrijft de rol van opinion leaders bij de promotie van Evidence-Based Practice in de verpleegkundige praktijk.

In **hoofdstuk 4** bestudeerden we de competenties van verpleegkundige opinion leaders. In deze verkennende studie hebben we een ondersteunend trainingsprogramma (Implementatie coach programma) ontwikkeld en uitgevoerd. Acht verpleegkundig specialisten, die een verpleegkundige richtlijn implementeerden op het moment van de training, voltooiden de opleiding van een jaar en waren onderwerp van onderzoek in deze studie. Er werden verschillende instrumenten gebruikt om specifieke competenties van de verpleegkundige opinion leader te inventariseren. Eenentwintig competenties werden geïdentificeerd, de belangrijkste daarvan waren: in staat zijn tot samenwerken, communiceren, delegeren, feedback geven, netwerken en informatie verwerken. Competenties die verbonden zijn met leiderschap werden door de verpleegkundigen genoemd als noodzakelijk. Managers vonden competenties met betrekking tot beleid en de dagelijkse praktijk (project management en training aan bed) belangrijker. Deze studie benadrukt dat er voor de complexe rol van een verpleegkundige opinion leader met een implementatie opdracht speciale competenties vereist zijn.

Verpleegkundige teams

Het derde deel van het onderzoek in dit proefschrift ging uit van de vooronderstelling dat team functioneren relevant is voor de kwaliteit van de zorg. Aangezien teams natuurlijke componenten van verpleegafdelingen zijn, hebben we in de literatuur gezocht naar teamkenmerken en teamstrategieën die een succesvolle invoering van innovaties in de verpleging vergemakkelijken (**hoofdstuk 5**). Het literatuuronderzoek resulteerde in negen relevante artikelen, echter met weinig bewijskracht. We identificeerden vijftien verschillende team kenmerken waarvan zes worden genoemd als belangrijk voor

succesvolle teams (heldere communicatie, duidelijke teamdoelen, elkaar aanvullende team eigenschappen, onderling vertrouwen, inspirerend en ondersteunend leiderschap, heldere rolverdeling en duidelijke verantwoordelijkheden). Daarnaast identificeerden we 21 teamgerichte strategieën met vooral een focus op onderwijs, monitoring, feedback en leiderschap. Deze strategieën werden vaak gecombineerd. Feedback werd het meest frequent gebruikt als strategie, terwijl leiderschap zowel teamkenmerk als strategie kan worden bestempeld. We concludeerden dat er weliswaar relevante teamkenmerken en teamgerichte strategieën werden beschreven, maar in relatief weinig studies en met weinig bewijs.

In **hoofdstuk 6** is de validiteit en responsiviteit van de Team Climate Inventory (TCI) geëvalueerd in relatie tot indicatoren voor de kwaliteit van zorg. In deze empirische studie, gebruikten we gegevens over de implementatie van richtlijnen door 42 Nederlandse verpleegkundige teams uit twee studies ('Safe or Sorry' trial en 'Helping Hands' trial). De resultaten bevestigden de verwachte relaties tussen teamklimaat en het opvolgen van richtlijnen niet. Bovendien reageerden de TCI scores niet op een implementatiestrategie die specifiek gericht was op het beïnvloeden van het teamklimaat. Daarmee kunnen we de validiteit en de responsiviteit van de TCI in deze studie niet bevestigen. De bevindingen doen de vraag rijzen of de TCI een geschikt meetinstrument is om het teamklimaat in relatie tot de verbetering van kwaliteit van zorg te meten. Verdere studies, met behulp van verschillende instrumenten, zijn nodig om te komen tot evaluaties van het teamklimaat en om de relatie tussen teamklimaat en de kwaliteit van zorg adequaat te bepalen.

Hoofdstuk 7 beschrijft een procesevaluatie waarin een op team en leiderschap gerichte implementatiestrategie wordt geëvalueerd. Het doel van de strategie was om belemmeringen op teamniveau op te heffen, door te focussen op de sociale invloed binnen teams. De resultaten lieten zien dat leiderschap en het elkaar aanspreken op ongewenst gedrag positief samenhangen met de gewenste gedragsverandering (betere opvolging van handhygiënevoorschriften) van verpleegkundigen op de lange termijn. De studie bevestigt daarmee het belang van het investeren in leiderschap en een positieve sociale invloed in teams.
In het laatste hoofdstuk worden de bevindingen van dit proefschrift samengevat en de resultaten van dit proefschrift besproken. Verder worden de consequenties van de resultaten beschreven en worden voorstellen gedaan voor toekomstig onderzoek.

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Currriculum Vitae

Gerda Holleman startte haar carrière in de verpleegkunde in het Radboud Ziekenhuis te Nijmegen. Haar interesse heeft altijd gelegen in het overbruggen van de kloof tussen theorie en praktijk in de verpleegkunde. Zij heeft praktische ervaring opgedaan in de verpleegkunde in Nederland, USA en Tanzania. Na haar opleiding tot verpleegkundige werkte ze eerst als verpleegkundige, daarna als docent, stafmedewerker, onderzoeker, teamleider en senior adviseur in verschillende organisaties. In Tanzania werkte zij eerst in een instituut dat kinderen met een verstandelijke beperking en straatkinderen opvangt en vervolgens als docent aan de verpleegkunde opleiding van het Muhimbili ziekenhuis te Dar er Salaam. In 1994 behaalde ze haar doctoraal als gezondheidswetenschapper aan de Rijksuniversiteit Limburg te Maastricht met Verplegingswetenschap als afstudeerrichting. In dat zelfde jaar voltooide ze de lerarenopleiding te Leusden. Van 1996 tot 2000 werkte ze als stafmedewerker kwaliteitsbeleid in het Cluster Snijdende Specialisme in het Universitair Medisch Centrum St Radboud te Nijmegen. Haar voornaamste opdracht was het begeleiden van het implementatietraject 'methodisch handelen'. Van 2000 tot 2005 werkte ze als junior onderzoeker voor de sectie Verplegingswetenschap van het Universitair Medisch Centrum St Radboud en in 2006 startte ze met haar promotieonderzoek. Van 2005 tot 2012 werkte zij daarnaast bij het Landelijk Expertisecentrum Verpleging en Verzorging (LEVV) als teamleider en senior adviseur. Als teamleider van het implementatieteam was ze verantwoordelijk voor het ontwikkelen, implementeren en vermarkten van diensten en producten die de kwaliteit van zorg verbeteren. Vanaf 2013 werkt ze als docent aan de Master of Advanced Nursing Practice (MANP) opleiding van de Hogeschool Utrecht en volgt zij de supervisoropleiding bij het Kempler Instituut.
Gerda is getrouwd met Hugo Weenen en heeft twee dochters, Tamar en Floor.