The dynamic interplay between novices, information practices and information culture:

A longitudinal study of nurses' information experiences and approaches from the last year of education through the f rst two occupational years

Anita Nordsteien

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A longitudinal study of nurses' information experiences and approaches from the last year of education through the first two occupational years

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Forord

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Horten, 18. mars 2019

Anita Nordsteien

Abstract

This thesis explores how nurses experience information and approach information practices and information culture, first as nursing students and then as new employees. It examines the mutual development of people, information practices and information culture through different stages of transition from education to work. The first stage studied is while they were writing their Bachelor's thesis in nursing education; the second stage covers the first weeks of employment as a nurse in a hospital; the third and fourth stages are following one and then two years of work experience. The Bachelor's theses were analysed in the educational context. Observation and focus group discussions in a hospital training programme provided the data material in the workplace context. Thus, most of the participants in this research were studied in two different contexts for three years in total.

Together, the three articles in the thesis consider the ways in which information practices and culture mutually influence the transition from being nursing students to competent nurses. General findings show that a great variety of information sources are used in education as well as in the workplace. This is consistent with EBP thinking, which seems to have a persistent influence on the participants' approaches to information over the three years of the study. The known practice/theory divide between education and workplace has become increasingly blurred as teaching practices have been diffused across the contexts. In this case studied, this was especially due to a supportive workplace training programme. Such programmes are seen to facilitate and support new employees' transition towards information resilience at work. In this study, this enabled mutual learning in dynamic work practices, since the novices exchanged up-to-date information and ways of finding reliable information with colleagues' tacit and collective ways of knowing.

Potential contributions of the thesis are firstly the acknowledgement of newcomers' values, skills and motivations regards to information, promoting a mutual relationship between individuals and communities. Secondly, the thesis provides an insight into how information practices may travel over time and place. Thirdly, there seems to be a shift in healthcare to use a greater variety of information sources influenced by EBP. Different occupations, communities and patients are collaborating to make decisions and create common procedures and guidelines, which indicates a change in the traditional hierarchies between the parties. This emphasises the flexible edge of information practices, traditionally considered as relatively standard and stable.

Sammendrag

I avhandlingen undersøkes nyutdannede sykepleieres erfaringer og tilnærminger til praksis og kultur relatert til informasjonshåndtering i utdanning og arbeidsliv. Et sentralt fokus i avhandlingen er den gjensidige interaksjonen mellom kultur, praksis og nyutdannede sykepleiere gjennom ulike stadier i overgangen fra utdanning til arbeidsliv. I første fase av forskningsprosjektet ble bacheloroppgaver i sykepleieutdanningen analysert; den andre fasen involverte de første ukene som ny sykepleier på et sykehus; den tredje og fjerde fasen ble gjennomført etter henholdsvis ett og to års arbeidserfaring. Datainnsamlingen på sykehuset innebar observasjon og fokusgruppediskusjoner i et traineeprogram. De fleste deltakerne i forskningsprosjektet ble studert i to ulike kontekster i totalt tre år.

De tre artiklene i avhandlingen uttrykker som en helhet noe om hvordan informasjonspraksis og informasjonskultur gjensidig påvirker overgangen fra å være sykepleierstudenter til å bli kompetente sykepleiere. Resultatene viser at et bredt utvalg informasjonskilder blir benyttet både i utdanningen og i sykehuset. Dette er i tråd med kunnskapsbasert praksis (KBP), som synes å prege deltakernes tilnærming til informasjonshåndtering gjennom alle tre år. Det velkjente teori - praksisgapet mellom utdanning og arbeidsplass blir gradvis redusert ved at de samme undervisningsformene i økende grad brukes i begge kontekster, for eksempel simuleringstrening. I denne studien hadde også traineeprogrammet stor betydning med tanke på å lette overgangen mellom utdanning og arbeidsliv. Slike programmer kan ses på som en støtte i å utvikle nyansattes resiliens med tanke på informasjonshåndtering på jobben. I denne studien bidro traineeprogrammet til gjensidig læring og en dynamisk praksis da de nyansatte delte oppdatert informasjon og metoder for å finne pålitelig informasjon med kolleger i bytte mot taus, kollektiv kunnskap.

Avhandlingens potensielle bidrag er først og fremst anerkjennelsen av nyutdannedes verdier, ferdigheter og motivasjon med tanke på informasjonshåndtering, noe som fremmer et gjensidig forhold mellom nyutdannede og ulike praksisfellesskap. For det andre gir avhandlingen et innblikk i hvordan informasjonspraksis kan forflytte seg over tid og sted. For det tredje synes den brede bruken av informasjonskilder i helsevesenet å være et gjennomslag av KBP. Ulike yrkesgrupper, praksisfellesskap og pasienter samarbeider for å ta avgjørelser og lage felles prosedyrer og retningslinjer, noe som indikerer en endring i de tradisjonelle hierarkiene mellom partene. Dette bidrar til en mer fleksibel informasjonspraksis.

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Article 2

Nordsteien, A. (2017). Handling inconsistencies between information modalities: workplace learning of newly qualified nurses. *Information Research, 22*(1), CoLIS paper 1652. Retrieved from http://InformationR.net/ir/22-1/colis/colis1652.html

Article 3

Nordsteien, A., & Byström, K. (2018). Transitions in workplace information practices and culture: the influence of newcomers on information use in healthcare. *Journal of Documentation, 74*(4), 827-843. https://doi.org/10.1108/JD-07-2017-0116

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List of abbreviations and terminology

EBP: Evidence-based practice: Involves professional decisions that are founded on scientific and experiential knowledge alongside patients' preferences in a given situation.

PICO: PICO is a schema or tool for making a research question and breaking it into search terms categorised by Population, Intervention, Comparison and Outcome.

1 Introduction

This thesis explores how nurses experience information and approach information practices and information culture, first as nursing students and then as new employees. It examines the mutual development of people, information practices and information culture through different stages of transition from education to work. The first stage studied is while they were conducting their final thesis in nursing education; the second stage covers the first weeks of employment as a nurse in a hospital; the third and fourth stages are following one and then two years of work experience. Thus, most of the participants in this research were studied in two different contexts for three years in total.

There are several studies on information-related activities of various occupational and educational groups, among them nurses (cf. Case & Given, 2016). However, few studies seem to have investigated such activities from a socio-cultural perspective, and even fewer of them over time and between different contexts. Moreover, there are only a handful of studies focusing on how new employees interact with established information practices and culture in the workplace (e.g. Hedman, Lundh, & Sundin, 2009; Lloyd, 2007a, 2009; Moring, 2011).

Insight into how new professionals, information practices and culture mutually interact and develop over time and place is important to be able to better support students' and newcomers' information needs and learning processes. Additionally, greater understanding of the characteristics of information practices and culture in an organisation is valuable to be able to manage and develop practices and organisations. There are several reasons for choosing nurses and hospitals as the case for the study. Hospitals are complex information environments, and information work and negotiations between health care professionals are a substantial part of the work tasks in hospitals (Strauss, 1985). Nurses are an interesting focus group in this regard; they are often the hub for information processes between patients and their relatives, physicians and other health providers (Hertzum & Reddy, 2015). Moreover, these information processes often deal with critical situations; the consequences may be fatal if information is not handled correctly. Thus, the transition from being a nursing student to a newly qualified nurse can be challenging and daunting (Edwards, Hawker, Carrier, & Rees, 2015). Globally, several training programmes for new nurses have been established to ease this transition process, and thereby

prevent nurses leaving their workplace or the profession already in the first year (Edwards et al., 2015).

The personal motivation to conduct this thesis is my own background and interest in leadership and personnel training in health care, coupled with my experience as a subject librarian in nursing education. Nursing students have several hours of evidence-based practice (EBP) in their curriculum. This includes literature searching and critical appraisal of research. I am interested in whether and, if so, how these skills are being utilised in the workplace. Previous research concludes that such skills are difficult to transfer from educational contexts, because other types of information are given higher priority in the workplace context (Bonner & Lloyd, 2011; Lloyd, 2009). In contrast, my experience is that the focus on EBP in health services has increased over the past few years, at least in Norway, where this study is conducted. I am curious about how this may affect information practices and culture in health care organisations. This is essential to reveal whether resources put into education and healthcare work appropriately and are beneficial to patient treatment.

In this first chapter, I will present the contexts of my study, explain my understanding of the main concepts used, and present the aim and research questions of the thesis.

1.1 The contexts of the study

The first article linked to this thesis, Article 1, examined the context of a group of nursing students writing their Bachelor's thesis. In Norway, nursing education is a three-year programme; half of the time is dedicated to clinical practice in hospitals, psychiatry and community care, and the other half to theoretical study. The students have theoretical assignments every term, which include using both syllabus nursing theory and research articles when analysing and reflecting upon specific clinical cases. The last year focuses largely on EBP, which means that the students are supposed to learn how to make professional decisions that are founded on scientific and experiential knowledge alongside patients' preferences in a given situation (Straus, Richardson, Glasziou, & Haynes, 2011). The students learn about patients' preferences and acquire experiential knowledge mainly during their clinical placements during their education. However, learning how to formulate clinical questions, searching for research articles and critically appraising the articles are areas of training

supported by the library and faculty in close collaboration, which is elaborated on in Article 1, Nordsteien, Horntvedt, and Syse (2017).

Two important student projects build on EBP in the last year of training. Firstly, a project in clinical placement, where the wards point to problems the students may help to solve or better understand. The project involves applying scientific literature, observing the problem on the ward and conducting interviews or surveys among the nurses to reveal their experiences; for example, how to decrease the number of accidental falls in a nursing home. Secondly, the Bachelor's thesis, which is required to take the form of an extended literature review focusing on a nursing-related problem. The typical thesis is about how to provide nursing care to patients with a specific diagnosis or symptom, and the chosen diagnosis often relates to what kind of institution or ward the student would like to work in after graduation. Thus, it is often a strategic choice, since a good Bachelor's thesis is considered an important asset to a job application. Grades in the upper half of the scale also allow students to qualify for admission to a Master's degree programme.

Article 2, Nordsteien (2017), is based on a case study of participants and non-participants in a two-year hospital training programme for newly qualified nurses in Norway, and Article 3, Nordsteien and Byström (2018), considers the views of the participants in the training programme only. The purpose of the training programme was to train newly qualified nurses to be confident, flexible and capable to work on different wards. The nurses in the programme were assigned to surgical, medical and psychiatric wards with an eight-month period in each, while the nurses not participating in the programme worked on the same ward throughout. They all got the same training and supervision on the wards; however, the training programme nurses worked on a full-time basis and most of the other nurses worked 75% part-time, which is usual on hospital wards. The other significant difference between the groups was the monthly simulation exercises and lectures given by dedicated specialist nurses and other experts involved in the training programme. The simulation exercises took place in the hospital's fully equipped simulation centre and included procedures like advanced cardiac pulmonary resuscitation, intubation, insertion of various catheters, as well as non-technical skills such as documentation, ethical reflection, efficient teamwork and the use of assessment and communication tools. The lectures covered subjects such as infection control and handling critically ill patients. Additionally, every monthly session had allocated time for participants to share and reflect upon their experiences.

Thus, this study deals with two quite different contexts, which traditionally build on different metatheoretical views of learning. While studying, the main focus for training nurses is on acquiring theoretical knowledge, whereas in the workplace learning application and practices is the main focus. The gap between theory and practice is a frequently discussed problem. However, the above characteristics of the teaching practices in the two contexts may indicate that the boundaries between them are becoming increasingly blurred. Lectures and high-fidelity simulation training have become common in the workplace as well, and the extent of clinical placements, practical exercises and solving real patient problems in joint educational - workplace projects are also examples of reducing the gap from the educational context. Workplace training programmes are one initiative to ease the transition between the contexts. Billett (2004) is arguing against a view of learning as a formal process occurring only in an educational context. Learning occurs in both education and the workplace as social participatory practices, and workplace learning should not be described as 'informal learning', which would indicate inferiority to learning in educational institutions.

The participants in the study will interchangeably be referred to as newly qualified nurses, novices, (non-) training nurses and newcomers depending on the context and also because the study connects to various fields within information studies, organisational studies, nursing and learning theories, all of which use different terms.

1.2 Key concepts

In this subsection, some main concepts that will be discussed throughout the thesis will be introduced; they include: information, knowledge, expertise, practice, communities of practice, information practices, information experience, evidence-based practice and information culture.

1.2.1 The relation between information and knowledge

'Information' is a complex concept to define, since it contains multiple meanings depending on the discipline in focus and the perspective chosen. Some of these meanings also overlap with other concepts, such as knowledge, communication, data and documents (Case & Given, 2016). Bateson (1972, p. 453) broadly defines information in the following manner: "In fact, what we mean by information - the elementary unit of information - is a difference which makes a

difference […]". This definition expresses that experiencing and interacting with information have the potential to cause a change. A slightly narrower definition is provided by Budd (2011, p. 69), who states that information is communicative, includes an exchange of real language, signs or symbols, is purposeful and involves a conscious use of language, which can be evaluated for meaning and truth. In this light, it is clear that information needs to be perceived as useful or relevant.

Some authors have tried to sub-categorise broader views of information. Buckland (1991, p. 351) defines three forms of information: 1) 'Information-as-process', which is the act of informing or communicating information, 2) 'Information-as-knowledge', that points to the knowledge that is communicated, and 3) 'Information-as-thing', which is informative objects, such as data and documents. In this sub-categorisation, information as a process is the focus of this study.

Ruben (1992, p. 23) emphasises the perspective of information as an epistemological question. He depicts three orders of information; the first order information includes "environmental artifacts and representations; environmental; data, stimuli, messages, or cues"; the second order information is "internalized, individualized appropriations and representations" and the third order information is "socially constructed, negotiated, validated, sanctioned and/or privileged appropriations, representations, and artifacts". These three orders of information may reflect varying perspectives of different disciplines. In natural sciences, which include medicine and nursing, the concept of 'information' may be recognised as the first order information. Information is associated with something that is set or instrumental like equipment instructions or physical patient measurements. Information is seen as an objective entity. In natural sciences, Ruben's second and third order information are recognised as individual or collective 'knowledge', respectively. Machlup (1983) has specifically examined the interrelations between data, information and knowledge. He points out that these concepts have often been placed in a hierarchy, with knowledge at the top. This is a view shared by some researchers, who regard data as a raw form of information, while knowledge may be viewed as "information that has been sifted, organized, and understood by a human brain" (Case & Given, 2016, p. 74). Machlup (1983) claims that knowledge can even be acquired by solely thinking as a state of knowing, not necessarily involving transfer of information.

This thesis adopts social constructivism as the epistemological perspective. This approach considers 'information' as "the product of a negotiated construction between individuals

interacting with the artefacts, texts, symbols, actions and in consort with other people in context" (Lloyd, 2010b, p. 12). This understanding could be related to Ruben's third order information. It connects to the claim that the use of language and symbols has to be meaningful in the actual context to be informative and regarded as 'information'.

The concept 'information' in this thesis, is close to the concept of 'knowledge' in nursing. The corresponding concepts of 'information management', 'information sources' and 'information sharing' in nursing are 'knowledge management', 'knowledge sources' and 'knowledge sharing', respectively (cf. Estabrooks, Chong, Brigidear, & Profetto-McGrath, 2005). Thus, the chosen concept may depend on what audience a publication is targeting. As a consequence, the concept 'information' may be treated as less important than 'knowledge' outside information studies and may be misunderstood.

The concept 'knowledge' has even more layers than 'information'. Aristotle promoted three kinds of knowing, which still are highly relevant and connect and equate practice to theory: 1) Episteme, that is the ability to use analytical rationality to acquire scientific knowledge, 2) Phronesis, which is practical wisdom or skilful performance and 3) Techne, that is instrumental rationality, the ability to create or produce artefacts as an end product (cf. Nicolini, 2012, pp. 25-27). Ryle (1990) elaborated on these concepts and expanded 'knowing that' something is the case (episteme) and 'knowing how' to do things (phronesis). Ryle's main emphasis was that 'knowing how' is a prerequisite for 'knowing that'. He explains that a truth has to be discovered to get to understand that 'know that' is the truth. In other words, discovering 'knowing that' requires 'knowing how' to apply different operations or methods to acquire the 'knowing that'. 'Knowing how' is knowledge acquired by repeated exercises, and may in turn be expressed in terms of 'knowing that'. However, 'knowing that' can be memorised, but there is no guarantee of being able to act on it: "Effective possession of a piece of knowledge - that involves knowing how to use that knowledge, when required, for the solution of other theoretical or practical problems" (Ryle, 1990, p. 16). 'Knowing-how' is not always easily articulated and is thus often referred to as 'tacit knowledge'.

In a practice-based approach, 'knowledge' is "a form of mastery that is expressed in the capacity to carry out a social and material activity" (Nicolini, 2012, p. 5). Thus, knowledge is a way of knowing shared with other people, acquired through learning how to behave in the actual context (Nicolini, 2012). Similarly, Wenger-Trayner and Wenger-Trayner (2015) use the concept of 'competence' to describe the negotiated and defined knowledge within a community

of practice. They claim that individuals do not have ‘competence’; individuals have ‘personal experiences’, which have to be negotiated and recognised as ‘competence’ by the actual community. That is, the defined competence in a community may not be regarded as knowledge outside the actual community. There is a landscape of different communities in a professional occupation like nursing, and the importance of boundary crossing between them is emphasised to achieve reflection and learning (Wenger-Trayner & Wenger-Trayner, 2015). Some relevant examples of boundary crossing in this thesis happen during the encounters between different groups of students, newcomers and experienced nurses, as well as nurses and different communities of physicians, and the various groups of nurses with different focus issues: education, research, management and the everyday patient care on a ward. Such boundary encounters may result in ‘knowledgeability’, which involves an insight into several relevant practices in the landscape (Wenger-Trayner & Wenger-Trayner, 2015).

1.2.2 Expertise

‘Expertise’ is a concept that is related to competence, knowledgeability and learning, and has been a focus of discussion amongst researchers for decades. In nursing, the seminal work of Benner (1984) is still heavily cited. She applies the Dreyfus model to nursing, and suggests that nurses move through five competency levels with increasing number of years of experience: ‘novice’, ‘advanced beginner’, ‘competent’, ‘proficient’ and ‘expert’. In this model, the individual nurse’s competence develops by a transition from 1) reliance on theory, rules and procedures to the use of personal experience from concrete situations, 2) the view of a situation as a collection of equal parts completing a whole with certain relevant parts, and 3) the act of a detached observer to an involved performer. The expert nurse has a deep intuitive understanding of clinical situations that involve tacit knowledge about how to make decisions about action, and no longer has to rely on principles, rules or guidelines (Benner, 1984).

Over the recent decades, nursing as a discipline has been constantly evolving, especially in terms of the importance of theory and research in all aspects of nursing. Thus, Benner’s definition of expertise as a tacit or intuitive embodied competence has been elaborated and challenged. Two significant reviews of the nature of nursing expertise can be used to summarise the main points of this discussion (cf. Ericsson, Whyte, & Ward, 2007; Hutchinson, Higson, Cleary, & Jackson, 2016).

The nursing researchers, Hutchinson and colleagues (2016), find in their analysis of 16 studies that individual characteristics as well as the practice environment are important to the development of nursing expertise. Like Ryle (1990), they claim that experience in terms of embodied understanding of the practice context is the foundation of expertise, which in turn shapes theoretical knowledge and skills. They regard experience, theory and skills as the fundamental ingredients for expertise. Additionally, this review summarises several specific characteristics of nursing expertise, which are all connected in a framework: 1) contextual sensitivity (self-awareness and patient sensitivity), 2) rapid discrimination of what is salient in a situation, 3) anticipatory perceptions of subtle events, 4) rapid and non-linear reasoning in complex situations (e.g. by using a variety of information sources), 5) integrative reasoning (assimilation and application of knowledge as well as critical reflection), 6) saliency and confident performance (rapid, intuitive decision-making and action), 7) lead and influence (a trusted and authoritative role model, who can teach and influence others, and 8) catalytic action (being a catalyst for change). This understanding of nursing expertise is broad and will be returned to later in the thesis.

Ericsson and colleagues (2007) are prominent researchers on expertise, mainly from the fields of psychology and learning systems. They challenge the role of theoretical knowledge and extended experience in their understanding of 'expertise' and apply a narrower approach in which they define 'expertise' as superior performance with superior treatment outcomes. In their review, they find that neither experience, intuition nor theoretical knowledge are related to superior performance. Superior performance is, however, dependent on the ability to encode relevant information to plan, evaluate and reason about potential actions in even infrequent situations. They claim that this ability is possible to develop by active engagement in deliberate practice like simulation exercises with immediate feedback on the outcome. This understanding of expertise has a cognitive orientation and is related to Hutchinson's point 4 and 5. In this thesis, the significance of simulation exercises and feedback is relevant to the hospital training programme, and provides an alternative view of the distribution of expertise among new and experienced nurses.

In information studies, an extensive review of the related field of expertise seeking is conducted (Hertzum, 2014). This review consists of 72 studies mainly from a workplace context; including engineering as well as education, healthcare and management. Expertise seeking is defined as "the activity of selecting people as sources for consultation about an information need" (p. 775),

and a range of factors that affect expertise seeking are considered. Findings that are relevant to this thesis include the finding that people and documentary sources such as text are being used as complementary information sources. It is established that accessibility and sufficient quality of information in terms of relevance and reliability are important when seeking expertise. Additionally, solving complex tasks are related to expertise seeking from a larger number of competent people. It was found that task uncertainty might increase the use of document sources, at least in healthcare. Finally, barriers to expertise seeking were found, including distrust in the source based on, amongst other issues, the source being perceived as biased, not up-to-date, incomplete or unreliable. Unlike Ericsson and colleagues (2007) and Hutchinson and colleagues (2016), the aim of Hertzum's review was not to define expertise, but it raises issues to be discussed later in this thesis. These reviews indicate that the discussion about what constitutes expertise is still contentious.

1.2.3 Practice

'Practice' is a concept that has been discussed in many different ways depending on the scholarly tradition it comes from. In this section, the approaches to practice that are most relevant this thesis will briefly outlined. This will be further elaborated on in the theoretical framework. The emphasis on 'practice' goes back to Aristotle, who emphasised early on the notion of knowing in practice (cf. chapter 1.2.1); however, 'practice theory' is often associated with Pierre Bourdieu. Bourdieu (1977) considers practice as a product of structures like 'habitus', 'capital' and social 'fields'. 'Capital' is used to refer to material or non-material values determining distribution of power, and 'fields' are used to relate to socially structured spaces of power positions. Thus, 'capital' and 'fields' are structures that position people in hierarchies and restrict what people can do. For example, in the field of healthcare, physicians have more educational capital than nurses and thus exercise power over nurses and to some extent restrict what they are allowed to do. Another example is experienced nurses versus newly qualified nurses, where longer experience is a form of capital. However, 'habitus' enables people to act across these structures and make changes. 'Habitus' may be understood as a system of integrated bodily and mental dispositions that affect people's perceptions, appreciations and actions, but these are still dependent on the social class people belong to, that is structure (Bourdieu, 1977).

This interrelation between actors and structures in practice is relevant in this thesis, especially the dynamic of power distribution between different groups. In Bourdieu's understanding of

practice, the structures are given priority. The structuration theory of Giddens (1984) is to some extent related to Bourdieu, when considering the relation between actors and structure. However, Giddens views structures as a duality, which restricts as well as enables people's actions. He considers practices to be regularised types of activities produced by an interdependent and equal relation between knowledgeable individual actors and structures like rules and resources. In comparison to Bourdieu, the competence and motivations of the individual actors are more recognised. This idea better relates to the contents of this thesis, and will be elaborated on in the theoretical framework.

'Practice' in the sense of engaging and learning in 'communities of practice' is another significant approach, presented by Wenger (1998). 'Communities of practice' may be considered people in informal groups with three shared characteristics: mutual engagement, joint enterprise and shared repertoire. 'Mutual engagement' involves maintaining close relations between the participants by interacting in joint activities. The participants may have complementary roles and share information, negotiate meaning and learn how to perform in the community. 'Joint enterprise' is about the participants negotiating the shared responsibilities of their domain of interest. The third characteristic refers to the 'shared repertoire' of routines, procedures, vocabulary, discourses, tools, actions and more, which have become an integral part of the practice. Participating in communities of practice involves negotiation of meaning and formation of identity.

This practice approach is strongly connected to concepts like 'situated learning' and 'legitimate peripheral participation', which are particularly relevant to newcomers and learning in the workplace. 'Situated learning' constitutes a view of learning as a social process of knowledge construction, situated in a specific context; learning about doing authentic tasks in real-world settings. Learning happens as people appropriate cultural tools, through their involvement in the activities of their community of practice. 'Legitimate peripheral participation' describes how novices gradually become experienced members of a community of practice; first by participating in simple peripheral activities, then in more and more advanced activities. Novices are expected to acquire the skills and vocabulary of their community of practice, they have to be socialised and accepted into the community to become legitimate and competent members. Novices learn and reproduce practice when experienced members of the community introduce them to the practice (Lave & Wenger, 1991).

Wenger's approach has been criticised for missing the dynamic of practices (cf. Nicolini, 2012). A relevant approach to study the development or change of practices has been introduced by Shove, Pantzar, and Watson (2012), which I will refer to as 'practice dynamics', and this concept will be elaborated on in the theoretical framework discussion. When considering the potential for change, it is also important to be aware of the power dynamics in the workplace. Power is distributed to varying degrees between the members of different groups. In this research, it is interesting to look at both power distribution and dynamics between different professions and between newly qualified and experienced nurses.

A widely cited article is that of the sociologist Reckwitz (2002), who has tried to work out the main common characteristics of practice theories, and emphasises that practice theorists focus on understanding body, mind, things, knowledge, discourse/ language, routines/ habits and change/ renegotiation, all in a social site or context. Reckwitz considers bodily activities, including routinised mental and emotional activities, as necessary components in practice theories. A practice is the product of a skilful or trained performance of bodies, such as how to do or say specific things. Mind or mental activities include ways of interpretation, emotions and purposes or motivational knowledge. The use of things, objects, tools or artefacts are also an important characteristic of practice theories. Reckwitz (2002, pp. 249-250) defines practice as a "routinized type of behaviour" consisting of "forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge". Clarifying this further, Reckwitz states: "A practice is thus a routinized way in which bodies are moved, objects are handled, subjects are treated, things are described and the world is understood" (p. 250).

Nicolini (2012) encourages using a combination of different approaches to practice, because they complement each other. For the data material in this thesis, it is useful to discuss the relation between agents and structures, novices' learning processes and membership in communities of practice, as well as practice dynamics and other practice characteristics.

1.2.4 Information practices

'Information practices' is a concept specific to information science, and is used interchangeably with 'information behaviour'. Savolainen (2007) reviews the use of these two concepts in information research. Both concepts refer to how people deal with information, however, they are said to have different metatheoretical foundations and emerge from different discourses

(Savolainen, 2007). Information behaviour has been the dominant umbrella concept in the research literature, in most cases drawing on the cognitive view of information according to Savolainen's literature review. Some of the most prominent definitions of information behaviour are: "…the totality of human behavior in relation to sources and channels of information, including both active and passive information seeking, and information use. Thus, it includes face-to-face communication with others…" (Wilson, 2000, p. 49) and "…we conceptualize information behavior as including how people need, seek, manage, give, and use information in different contexts" (Fisher, Erdelez, & McKechnie, 2005, p. xix).

Information practice has come to be a critical alternative to information behaviour, growing out of social constructivism. Some of the contemporary proponents of information practices are McKenzie (2002, 2003); Tuominen, Talja, and Savolainen (2005) and Lloyd (2009, 2010a, 2010b, 2010c, 2011). McKenzie (2002, pp. 37-38) clarifies in one of her contributions that: "The broader term 'information practices' is used here rather than the more common 'information seeking' or 'information behavior' in order to encompass the entire range of activities…"

Tuominen and colleagues (2005) emphasise that:

> From the constructionist viewpoint, the concept 'information practice' is preferred over 'information behavior', since the former assumes that the processes of information seeking and use are constituted socially and dialogically, rather than based on the ideas and motives of individual actors. All human practices are social, and they originate from the interactions between the members of a community. (Tuominen et al., 2005, p. 328)

Savolainen (2007, p. 121) denotes information behaviour as an individual and decontextualized approach in contrast to the more contextual and social information practice. He characterises the use of information practice as a concept in favour of information behaviour as a conceptual shift.

However, some researchers have questioned both these concepts. Frohmann (2004) recommends not using 'information' as a concept at all, but rather to focus on "the intertwined, institutionally disciplined, documentary and non-documentary practices from which 'information' emerges as an effect" (p. 198). Cox (2012) agrees with this and claims that none of the above concepts is functional, because they point to information as a primary centre of different activities and not as a phenomenon embedded in all social activities. Thus, Cox

suggests using the alternative concept of ‘information in social practice’ (2012, p. 185). Both authors make important points here by disassembling process and outcomes.

In this thesis introduction, I choose to use the concept ‘information practice’ to be able to best relate to the established practice in the community I feel connected to and want to build my research on. Additionally, I think ‘information practice’ better encompasses the deeper social understandings underlying this thesis. However, I will use expressions like ‘approaches towards information’ and ‘information-related activities’ when referring to the newly qualified nurses to keep the group of newcomers and the established community apart. Additionally, it implies that newly qualified nurses have neither fully adopted the established practice nor had the ability to do so, because, as yet, they do not know the tacit knowledge underlying the practice.

My understanding of the concept ‘information practices’ will be in close proximity to the following definition that comes from a constructionist point of view:

> An array of information related activities and skills, constituted, justified and organized through the arrangements of a social site, and mediated socially and materially with the aim of producing shared understanding and mutual agreement about ways of knowing and recognizing how performance is enacted, enabled and constrained in collective situated action. (Lloyd, 2011, s. 285)

Another related concept used in this thesis is ‘information experience’, which is an emerging concept in information studies that is often connected to phenomenology (Bruce, Davis, Hughes, Partridge, & Stoodley, 2014). From a broad understanding of ‘information experience’, it is the nature of people’s engagement with information in different contexts. Bruce and colleagues (2014) emphasise that researching ‘information experience’ involves an exploration of “what is experienced as information and how it is experienced, how information is present or appears, how it is created, and its role and influence in people’s lives” (Bruce et al., 2014, p. 317). Compared to ‘information practice’ and the study of people’s information activities and skills, ‘information experience’ points to how people view information in their context and what they feel about it.

1.2.5 Evidence-based practice

Evidence-based practice (EBP) is another approach to practice and a central aspect of today’s healthcare education and workplace activities worldwide. In this study, EBP plays a role in both

the contexts of the participants. Straus et al. (2011) claim that evidence-based practice is essential for ensuring patient safety. Thus, after graduation nurses are expected to be familiar with evidence-based practice and able to use the best available information to guide their practice. EBP is the red thread between the three articles in this thesis. Article 1 focuses on the role of EBP in the writing of the Bachelor's thesis in nursing education, and in Article 2 and 3, EBP is inherent in the nurses' information practices and culture.

EBP consists of five dimensions according to DiCenso, Guyatt, and Ciliska (2005), who are considered to be leading scholars within evidence-based practice: 1) The clinical context, which refers to the characteristics of the actual clinical setting and the patient's clinical state, 2) patient values and preferences involving the desire and motivation of the individual patient, 3) research evidence, which is about finding clinically relevant research based on good methodology, 4) health care resources, which involve consideration of the costs relating to the benefits, and 5) clinical expertise, which integrates the other dimensions by using clinical skills and experience. All these dimensions have to be taken into account in clinical decisions.

DiCenso and colleagues (2005) address several misconceptions about evidence-based practice. Some people believe that EBP is all about quantitative research evidence, preferably randomised controlled trials and meta-analyses. However, the authors explain that research evidence is dependent on the clinical question that is asked. For example, a question about patients' experiences related to illness has to rely on qualitative research, while a question about the effect of a treatment should be answered by randomised controlled trials. Practices and conceptions are changing. The acknowledgement of qualitative research is improving, and over the last years even started to be included in the Cochrane Library, which was initially established to meet the need of systematic reviews of randomised controlled trials (Melnyk & Fineout-Overholt, 2015). Another criticism of EBP is about being too little person-centred and not considering other kinds of knowing in practice, such as ethical reasoning, tacit bodily skills and interpersonal relations. However, all these kinds of knowing constitute clinical expertise, which is one of the main dimensions in EBP (DiCenso et al., 2005).

The word 'evidence' may be confusing. DiCenso and colleagues (2005, p. 12) claim that "any observation about the apparent relation between events constitutes potential evidence" and they emphasise that a clinical observation of an individual nurse counts as a source of evidence. 'Internal evidence' involves nurse practitioners considering factors such as patients' clinical status and preferences, interprofessional clinical expertise and the decision-making context,

while 'external evidence' is the utilisation of research in decision-making (DiCenso et al., 2005; Melnyk & Fineout-Overholt, 2015).

EBP has also been discussed in social sciences. The sociologist Stefan Timmermans is at the forefront in this field of investigation. He considers EBP as a form of standardisation. According to Timmermans and Berg (2003), supporters of EBP emphasise that standards bring order and contribute to effective communication and collaboration between professionals and institutions. EBP offers "…a tight link between medicine and scientific evidence, leading to better and more efficient care, improved health outcomes, better educated patients and clinicians, a scientific base for public policy, a higher quality of clinical decisions, and better coordinated research activities" (p. 18). Critics claim that professional autonomy, innovation and creativity are undermined in EBP, which entails a loss of individualised treatment. Additionally, they claim that some standards in certain cases are inefficient and even based on biased research. Standards may be considered general "recipes" that guide clinical practice at the expense of experts' intuition and experience (Timmermans & Berg, 2003).

1.2.6 Information culture

'Information culture' is another concept that has been defined in many different ways dependent on discipline, from a focus on utilisation of information technology to employees' values and attitudes to information.

In organisational studies, the main focus has been on information technology and decision making. This quotation represents this view and suggests that 'information culture' is:

> A culture in which the value and utility of information in achieving operational and strategic success is recognised, where information forms the basis of organizational decision making and Information Technology is readily exploited as an enabler for effective Information Systems. (Curry & Moore, 2003)

Curry and Moore (2003) consider several components to be part of information culture: vertical and horizontal communication including formal and informal information sharing; cross-departmental partnerships; internal environment including cooperation, openness and trust; clear documentation and procedures; information management; and information systems management. Other organisational researchers, Marchand, Kettinger, and Rollins (2001), categorise the above aspects of information culture into three organisational "information

capabilities”: 1. Information values and behaviour, 2. information technology practices, and 3. information management practices. Marchand and colleagues wanted to illuminate how the interactions between people, information and technology affect business performance. The ‘information values and behaviour capability’ of Marchand and colleagues and the components regarding information sharing and collaboration of Curry and Moore (2003) are related to how information culture most often has been approached in information science.

Ginman is a representative for the first period of information studies on information culture. Ginman (1988) finds that a highly developed information culture may be considered as a strategic goal to achieve successful business performance. She claims that maintenance and transformation of intellectual resources like information and knowledge is a prerequisite for the functioning and development of organisations’ core operations. Since the 2000, several information studies on information culture have been published. Some influential examples are Choo et al. (2006), who claim that information culture includes the elements of an organisation’s culture that influence the use of information: “the socially transmitted patterns of behaviors and values about the significance and use of information in an organization” (Choo, 2006, p. 492). In line with this, Oliver (2003, 2008, 2011) characterises information culture as values accorded to information and attitudes towards it. Some of the attitudinal issues were connected to information sharing, trust in written documentation and preference for textual or oral information sources. Another study by Widén and Hansen (2012) emphasises that “Information culture is about information practices, attitudes to information, communication flows, trust and collaboration. Information culture is the overall context to how the internal environment supports information sharing and management” (p. 4). Thus, values, attitudes, trust, information sharing and collaboration are some common characteristics of the various approaches.

Widén (2017, p. 10) points out that “information culture gives a practical framework for developing management practices that support effective information use and knowledge creation”. The first information capability of Marchand and colleagues (2001), ‘information values and behaviour’, includes the above mentioned most common attitudes to information and is used as a practical framework in several information studies (e.g. Abrahamson & Goodman-Delahunty, 2013; Bergeron et al., 2007; Choo, Bergeron, Detlor, & Heaton, 2008; Choo et al., 2006; Detlor et al., 2006). This framework proved to be suitable in this study too and is here referred to as *approaches to information use* to avoid conceptual confusion due to

differing definitions of the term information behaviour in the work of Marchand and colleagues and information studies in general. In the study of Marchand and colleagues, these approaches were found to include six interrelated dimensions that enhance effective information use: information integrity, formality, control, transparency, sharing and proactiveness. These dimensions are defined and elaborated on in Article 3, Nordsteien and Byström (2018).

In Article 3, a conceptual model of the interrelations between newcomers, information practices and information culture was made. Information culture may be characterised as attitudes or approaches to information use and its role in different activities on an organisational level. The information culture surrounds and mutually affects the information practices, which are present at the professional or community level. The inner level consists of individual people like newcomers, who mutually interact with the other two levels (Figure 1.1).

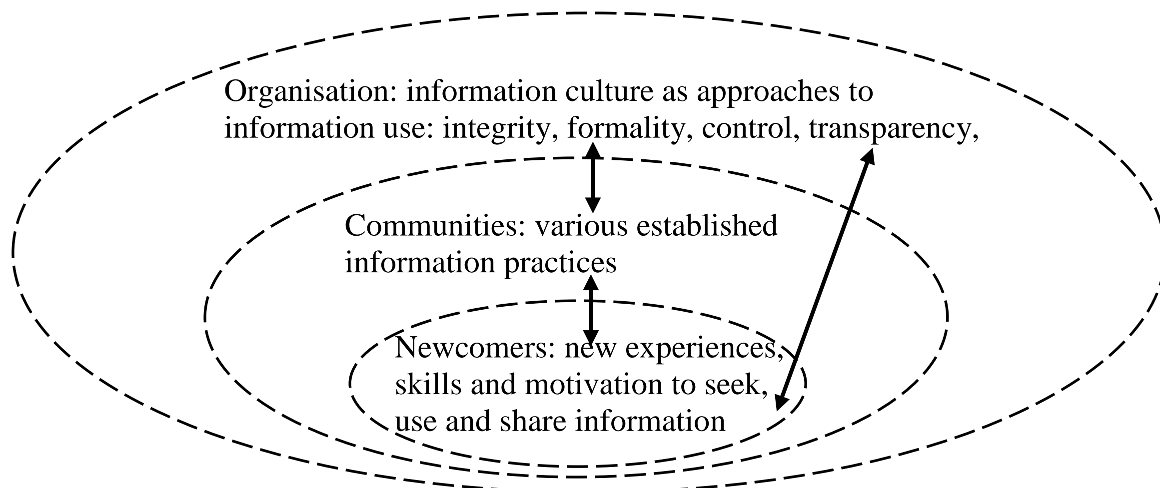

Figure 1.1: The conceptual interrelations between information culture, information practices and new organisational members (Nordsteien & Byström, 2018)

1.3 Aim and research questions

This study mainly builds on and contributes to research about workplace information practices. Although studies in information science have examined information practices in the workplace context and even in health care, there has not been much focus on newcomers in the workplace or a longitudinal examination of information practices in transition from education through the

first years in the workplace. This project sets off to provide additional insights into how information practices affect the relations between newly qualified and experienced nurses in the workplace, and how mutual learning and transformation of information practices take place.

The aims of this thesis are to explore newly qualified nurses' information experiences and approaches towards information practices and culture during their education and in the workplace, and to examine how these newcomers, information practices and culture mutually interact and develop over time. Thus, the practice dynamics are the focus in this study.

Four research questions are addressed:

1. What characterises information practices and culture in nursing education, based on analysis of the final Bachelor's thesis?

2. What characterises information practices and culture in the workplace according to newly qualified nurses' experiences?

3. How do newly qualified nurses interact with existing workplace information practices and information culture, and based on this, how do these three develop through interaction?

4. How do newly qualified nurses' information experiences and approaches towards information transform from the last year of their education through the first two years in the workplace?

There are several potential approaches to study newcomers and workplace information practices and culture. Therefore, there is a need to define the approach focus, establishing also the areas excluded. Firstly, I gained access to this case, because the hospital considered it useful to have an external partner for the evaluation of the training programme. The prerequisite was not to take nurses out of duty or interfere with the daily patient work. Therefore, I had to focus on the training programme only and mainly conduct focus groups with the training nurses, although observing the newcomers and the practices and culture on the different wards could have complemented the data material. Secondly, not being able to observe the practices restricts the possibility to study bodily information, although it is an essential type of information in nursing (cf. Bonner & Lloyd, 2011). Finally, the study is closely related to research on collaborative information practices, which is not a part of this thesis, but could be a theme for another research article.

1.4 Outline of the thesis

Chapter 2 contains a literature review of newcomers' approaches to information in general and health personnel's approaches to information specifically. Chapter 3 describes Giddens' structuration theory and collectivism as the ontological and epistemological framework in the study, respectively. Practice theories including socio-cultural perspectives on learning constitute the main theoretical framework. Chapter 4 focuses on methodology and describes the quantitative and qualitative data collection and analysis, ethical and methodological considerations. The three articles are summarised in chapter 5. Finally, the discussion in chapter 6 is organised into four parts, based on the four research questions: 1) information practices in nursing education, 2) information practices and culture in the workplace, 3) interaction between three levels of information agency, and 4) transformation of newcomers' information practices. Finally, the thesis is concluded in chapter 7.

2 Literature review

According to Case and Given (2016), research on workplace information behaviour started in the 1940s, the first decades primarily investigating information needs and information sources of scientists and engineers, and eventually expanding to social science and humanities scholars. Later, there was a shift in the research focus towards outcomes of encountering, seeking and receiving information. Other occupational groups were studied, and health personnel's information behaviour attracted much attention. This is still the case, especially physicians and nurses. In the last decade, information behaviour research has moved towards an interdisciplinary, holistic understanding, applying theory and research from various scientific fields (Case & Given, 2016). This thesis follows the interdisciplinary trend; drawing on theories and research from the fields of social sciences, organisational studies and learning theories. It builds on previous research focusing on health personnel's information practices. Thus, the initial literature review provides an overview of studies from different research fields, which have focused on newcomers' interaction with information. Newcomers from several occupations are included since they have the common challenge of being new members in their communities of practice and therefore, have to negotiate their role. Next, a selection of studies of health personnel's approaches to information are reviewed, with an emphasis on nurses. Then finally, the contribution of this thesis is discussed in the light of the reviewed studies.

2.1 Newcomers' approaches to information

Information research is considering newcomers in several different occupations: for example physicians (Hult, Byström, & Gellerstedt, 2016; Isah & Byström, 2016; Isah & Byström, 2017), sales assistants (Moring, 2009, 2011), academics (Willson, 2018), fire fighters (Lloyd, 2005, 2007a; Lloyd & Somerville, 2006), ambulance officers (Lloyd, 2007a, 2009) and nurses, teachers and librarians (Hedman et al., 2009). Common to these studies are a sociocultural stance and in which the practice is the point of departure. The workplace information practices are thus considered as situated and shaped by the context and the actual social practice. Learning is collective, informal and embedded in the work activities of different communities of practice. Two main approaches emerge from the review, one is workplace information literacy; the other

is the focus on how information practices affect power relations between newcomers and experienced employees in the workplace.

2.1.1 Workplace information literacy

Information literacy is often defined differently in the workplace context than in the educational context. Common understandings of educational information literacy are that it concerns solely textual information, which is characterised as transferable and oriented towards individual competencies in contrast to workplace information literacy that is a collaborative process in which newcomers engages with shared and agreed meanings of the collective practices in the actual community of practice (Lloyd, 2005; 2007a; Lloyd & Somerville, 2006). Workplace information literacy is complex and multimodal and newcomers have to engage with information from physical, social and textual sites of knowledge to be able to *become* a practitioner in the actual community. Educational information literacy practices based on textual information solely will only provide learning about how to *act* and forms a subjective construct of practice (Lloyd, 2005; 2007a; 2009; Lloyd & Somerville, 2006).

Lloyd emphasises that newcomers' learning processes are dependent on affordances, which is invitations or opportunities afforded by the community to get to know the social and physical sites of knowledge in the practice, e.g. the embodied and nuanced. For example, newcomers observe experienced member doing specific procedures, which enables the opportunity of the newcomers to acquire information from the embodied site of knowledge. The social site of knowledge provides experiential and affective information. Affective information is connected to culture as it involves group values and attitudes. Use of certain types of textual information may be encouraged if it is valued by the community (Lloyd, 2005; 2009; 2011). However, the transition from education to the workplace usually means developing the capacity to recognise the other forms of knowledge, which are relevant to the setting (Lloyd, 2007b, 2009).

Another highly relevant concept related to information literacy is information resilience (Lloyd, 2013). Newcomers are experiencing uncertainty and even anxiety due to being new to a context and faced with challenges they have never met before, but at the same time being surrounded by more information than ever before. Lloyd emphasises that information literacy is the catalyst for workplace learning and enables people to navigate the information landscape that results in development of information resilience. Information resilience involves the capacity to engage

with information to solve problems, adapt to change and new situations, transform workplace practices and reduce conflicts and stress related to information needs (Lloyd, 2013).

Teaching information literacy in the educational context should be made relevant also to the workplace context. This requires in-depth insight into what information that is valued and used in the specific workplace practice and by which activities it is relevant to access this information (Lloyd, 2005). Lloyd suggests that librarians should guide the students in their engagement with information rather than teaching them predefined information sources, that students should be guided throughout their study in their development of information skills, integrate the library sessions into curriculum and work collaboratively with peers and practitioners to solve information tasks that have practical application (Lloyd, 2005; 2011). The understanding of nurses' information practices as social and embodied as well as epistemic is also important to inform nurses' transition from education to clinical practice (Bonner & Lloyd, 2011). Information literacy should be taught in such a way that it gives students the ability to continue learning on an ongoing basis, regardless of different practices and a continuously changing information landscape (Hedman et al., 2009).

The challenges nursing students face in their transition from students to qualified nurses have been described in several reviews of transition programmes for newly qualified nurses (e.g. Al-Dossary, Kitsantas, & Maddox, 2014; Edwards et al., 2015). These reviews investigated residency programmes and other kinds of support such as simulation-based graduate programmes, and preceptorship. Most were 12-month programmes. The findings showed that such interventions increased the new nurses' confidence, competence, critical thinking and job satisfaction, as well as reducing stress, anxiety and turnover (Al-Dossary et al., 2014; Edwards et al., 2015). Improvements were also reported in hands-on nursing skills, clinical decision-making and leadership skills (Al-Dossary et al., 2014). The type of intervention was found to be less important, because the investment in easing the new nurses' transition was considered the essential function (Edwards et al., 2015). In this thesis, such transition programmes are shown to enhance workplace information literacy and development of information resilience. Information resilience in this context involves adapting to the new information environment, despite the reality shock of transitioning from education to practice.

2.1.2 Power dynamics in information practices

Power dynamics related to information practices consider the relationship between the different parties in the workplace in which in this case may involve newcomers, experienced colleagues and managers as well as patients. Who define what type of information that counts in the specific context? Power dynamics are strongly connected to discourses and newcomers have to engage with different discourses in the workplace: the institutional, which is formal information like rules and procedures and the collective discourse that is the agreed way of knowing through interaction with the community (Lloyd, 2007a). That means, workplace training programmes most likely introduce formalised, institutional information to newcomers, which is contested by experienced colleagues that guide the novices to the collective discourse (Lloyd, 2007a). Engaging with different types of information is enabled or constrained through the social site and ways of knowing are thus sanctioned or legitimised (Lloyd, 2011).

At the same time, there are competing occupational discourses. Bonner and Lloyd (2011) points out the tension between the medical and the nursing discourse in which the medical discourse is dominant. Sundin's (2003) main findings were that nurses dealing with professional information, challenge the power relations, both within their own profession and the broader medical profession. The older generation of nurses were trained to operate in the medical domain, while the new generation of nurses are trained to a greater extent to handle professional information. Dealing with professional information strengthens and defines the nurses' occupational identity but may cause conflict with more experienced nurses. However, professional information is of great symbolic value and can be used strategically to enhance professional interests towards other professions. Sundin and Hedman (2005) develop these findings further as they introduce the concepts of information interests and professional projects. Different professional groups in the workplace are striving to expand their knowledge domain; competition for information serves to change occupational identity and power relations between the professions. The nurses' professional projects are to develop their knowledge domain beyond the medical domain and to achieve higher professional independence.

Johannisson and Sundin (2007) claim that the two identities in nursing may be divided into a medical occupational identity operating at the workplace level, and a nursing-oriented identity at an occupational level. Johannisson and Sundin describe these coexisting identities as competing discourses that influence nurses' information practices. In the new occupational identity of nurses, producing, seeking, evaluating and using professional nursing information

is important, while the medical information is assessed as more relevant in the medical identity at the workplace level. Johannisson and Sundin cite an instance where a nurse refers to a high-ranking medical journal when discussing with a doctor, an example of how nurses can use information practices to change power relations. Thus, these discourses are seen as tools for promoting nurses' construction of a professional identity. In this way, information practices are considered purposeful instruments to accomplish goals beyond work tasks (Johannisson & Sundin, 2007).

In medicine, the power of the physicians have traditionally been incontestable, and in some countries, the hierarchies are still strong and affect the information practices (Isah & Byström, 2016; 2017). These studies found that new physicians in a developing African country use textual information sources more openly than experienced physicians because it is expected, but at the same time, they are often asked questions by their experienced colleagues to control that they have the expected competence. In contrast, some findings in a Swedish study indicate a weaker hierarchy as people are learning together; even the patients are searching and learning together with the physicians (Hult et al., 2016). This study also found that there is a shift towards EBP-integration in clinical work and that information is shared in a global community.

The interaction between information practices and the practitioner-patient relation is also a focus in the research of McKenzie. In one of her first publications, the communication barriers and information-seeking counterstrategies between pregnant women and their physician were investigated (McKenzie, 2002). McKenzie finds that the pregnant women were active, vigilant information seekers in their encounters with the physician. Their active participation made the pregnant women indispensable partners, which enabled the physicians to do their work more effectively. Consistent with Hult and colleagues (2016), information practices reduced the asymmetry in the practitioner-patient relationship.

Newcomers' contributions and renegotiation of practices are only briefly mentioned in information research. Moring (2009; 2011) experienced in her study of sales assistants that information valued in one community could be contested in another. In this case, an ambitious newcomer did not accept the information practices of his colleagues. He experienced that the colleagues gave him incorrect information and he used his spare time to read and find the right answers. However, he did not want to renegotiate the practices because of potential conflicts. Another study found that many early career academics use practical information about the university to challenge and push for change in practice, for example in administrative tasks

(Willson, 2018). Willson explains that there is often a gap between institutional official policies and actual practice. In transition from previous experiences, new academics use their colleagues as information sources to make decisions about how to use their agency to handle the work within academia.

Organisational studies do not use renegotiation as a concept; however, this research nevertheless describes a more equal relationship between newcomers and the community. Several studies emphasise that newcomers who take a proactive role to seek information acquire a better ability to perform their tasks and integrate well into the organisation having easier access to the community (e.g. Fetherston, 2017; Morrison, 1993a, 1993b; Paré & Le Maistre, 2006). Paré and Le Maistre (2006, p. 378) found that newcomers who "take chances, dare to fail, set their own goals, [and] ask hard questions" have a better experience of workplace learning than others. Additionally, challenging the existing practice stimulates and changes the community as the habitual practice will be reconsidered and may even be revised. Thus, proactive newcomers may lead to mutual transformation of both newcomers and community (Paré and Le Maistre, 2006).

2.2 Health personnel's approaches to information

Several of the information studies focusing on health personnel are concerned with information needs. An early example is the influential review of 11 studies of physicians' information needs by Gorman (1995), aiming to inform developers of information systems. Gorman presents a framework for defining the types of information the physicians use, which is still highly relevant. It includes patient data (such as patient and medical records), population statistics (such as public health data), medical knowledge (such as journals and textbooks), logistic information (such as procedure manuals) and social influences (such as asking colleagues about local practices). A main finding is that the preferred information sources are human, due to the highly complex clinical questions about optimal care of the individual patient. The colleagues provide the best answer to a specific patient care problem, because these questions often involve several clinical domains and interdependent issues of diagnosis and treatment. It is often not about simple answers found in a procedure manual (Gorman 1995).

Later studies of physicians' approaches to information support also point to the importance of human information sources. However, 20 years on, there has been substantial development in information accessibility and use of supporting information systems, though still with potential for improvement in the context of problems of a technical nature (Hult et al., 2016). Several studies have employed a more holistic approach to information sources, including awareness of physical as well as textual and social information sources. Isah and Byström (2016) explore information practices of hospital physicians in Africa, and find that these three kinds of information sources are intrinsically complimentary and embedded in the work activity itself. Textual sources include both printed and digital information, social sources are one-to-one conversations and communicative group activities like ward rounds and morning reviews, and physical sources involve bodily contact using senses.

An influential study of nurse practitioners, who primarily need information related to drug therapy and diagnosis, frequently use colleagues, medication reference manuals, textbooks as well as journal articles (Cogdill, 2003). Printed sources were preferred with regard to information about drug therapy, and asking colleagues for information related to diagnosis. Interestingly, Cogdill finds that those who have a Master's degree have more frequent information needs. He emphasises that educational and outreach programmes are needed to promote clinical research in order to make evidence-based decisions. However, human information sources are often preferred over research due to being perceived as more useful and accessible. Colleagues provide context specific, clinically relevant, time efficient information, which requires minimal critical appraisal (Thompson, Cullum, McCaughan, Sheldon, & Raynor, 2004). Thompson and colleagues find that nurses use research in continuing professional development and education, or when making local protocols or guidelines, dealing with clinical trials or when resolving conflicts between colleagues.

A review of nursing and information studies supports that other people are the most frequent source of information (Spenceley, O'Leary, Chizawsky, Ross, & Estabrooks, 2008). McKnight McKnight (2004) specifies that nurses tend to seek information from colleagues from different professions as well as patients and their caregivers. McKnight (2006) finds that the nurses' information practices are intense and patient-specific. MacIntosh-Murray and Choo (2005) agree with that and point out that the nurses prefer efficient and oral patient related information. General information meetings, information through e-mail and research information are not prioritised since accessing these resources takes time from patient care. This may also be an

exercise of power; a passive resistance against certain information sources. Another possible explanation is that the nurses may not be aware of their information needs, because they are "coping from shift to shift" with the daily routines and tasks. Nurses may also lack information skills and competency in critical thinking (MacIntosh-Murray & Choo, 2005).

In addition to oral information from other people, the nurses seek information from many electronic patient systems and through sensory observations. They also search social and logistical information, but very rarely information not connected to their patient or research-based information, as McKnight (2006) calls knowledge-based information. Most nurses regard research as important for their practice, but some think that it is ethically wrong to take time from the patients to read (McKnight, 2006). However, Hedman and colleagues (2009) claim that research has no natural place in everyday nursing practice. The information practices that apply here are related to administrative tasks, such as documentation and rapid reference enquiry textbooks, procedure handbooks and Internet use for practical information about diseases, diagnoses and procedures. Dealing with research is not as necessary in clinical work, the work tasks' character is different and also the traditions and expectations of colleagues (Hedman et al., 2009).

Spenceley and colleagues' (2008) list some more contextual factors that influence nurses' information practices: the availability of sources, administrative and research support, the culture (climate for learning and involvement of nurses and their leaders in design of information systems and system implementation), training, expectations in society, the urgency of information need, time pressure and priority of tasks. Time constraints as a barrier to acquire and read textual information are also found by McKnight (2004). Another conclusion of Spenceley and colleagues is that healthcare and the nursing role are changing, which leads to changing information needs and a demand for new knowledge and strategies to support nurses' use of information. They state, "The demand for access to more and better information has been fuelled by the EBP healthcare movement, and all health professions have renewed their emphasis on narrowing the gap between research and practice" (Spenceley et al., 2008, s. 955). Based on this EBP healthcare movement, there have been discussions about what counts as knowledge in nursing. Bonner and Lloyd (2011) found in their study of renal nurses that nurses have a strong relationship to embodied as well as social ways of knowing, the "how" of the practice. However, in order to provide efficient and holistic care, to continue learning and improve practices, those have to be connected to evidence-based information, the "why" of

practice, which is scientifically based information corresponding with the medical and evidence-based discourse (Bonner & Lloyd, 2011).

In workplace information research relating to health personnel, nurses and physicians working in interdisciplinary teams has been highlighted as core to collaborative information behaviour (CIB) (e.g. Reddy & Jansen, 2008) and collaborative information seeking (CIS) (e.g. Hertzum & Reddy, 2015). Reddy and Jansen (2008) examine CIB in an emergency ward and an intensive care unit. They identify three major characteristics of CIB: 1) communication that involves sharing and putting together pieces of information from multiple sources to meet information needs, 2) the complexity of the information needs requiring several team members to draw on their complementary expertise, and 3) information systems, such as electronic patient records and Web-based sources are being used to support other types of information sources. Emergency wards are also the research site for Hertzum and Reddy (2015). Their aim is to explore how specific procedures shape CIS. They identify the use of a triage procedure to prioritise the patients according to urgency and a timeout procedure in form of collaborative reflection using an interactive whiteboard. The triage procedure specifies what pieces of information to look for, how to interpret the information and it provides common ground for comparing across different patients. In this way, the task is made efficient. The reflection timeouts provide learning and sharing opportunities for new physicians to be able to discuss their patients with more experienced physicians.

In summary, several studies investigate workplace information practices. The European Network for Work Information (ENWI) developed a conceptual map of this research (Widen, Steinerová, & Voisey, 2014). The map consists of four main categories that should be approached holistically: 1) Information use and processes including work tasks, information activities and practices, 2) Context including culture, climate, community, tools and situational factors, 3) Components such as, the expertise of actors, organisation, systems, roles and sources, and 4) Information content: quality, format, types (e.g. formal/informal), domain specific content etc. Consistent with the focus on activities in current information research, information use in context is the core of research into workplace information practices (Widén et al., 2014).

2.3 Contribution of this thesis

Although studies in information science have examined information practices in the workplace context and even in healthcare, there has not been much focus on the interplay between information practices and newcomers' transition from education to the workplaces. At the best, the focus has been on how newcomers align to the community. This study emphasises a mutual relationship between individuals and information practices in the workplace. Another focus is on how information practices may travel over time. There are few longitudinal studies of information practices (Greyson, 2016). This study provides additional insights into the practice dynamics: how information practices affect the relations between newcomers and experienced workers in the workplace, how practices may change and how the information experiences of newcomers change over time. Finally, newcomers and information practices are connected to information culture, which also is an under-focused area.

3 Theoretical perspective

This chapter describes the meta-theoretical foundation for the thesis, which is based on social constructivism. The ontological framework, which encompasses the relation between human agency and social structures is outlined, and argumentation for choosing collectivism as an epistemological point of departure. Through this process, the focus on the interplay between people, practices and culture in a professional community is brought to the fore. For the same reason, practice theories are chosen as a theoretical framework. In this chapter, practice theories are connected to the social sciences, social learning theories and information science (this is initially outlined in the conceptualisation of ‘practice’ in 1.2.3).

3.1 Metaviews

Ontology and epistemology are two important intertwined concepts underpinning all research. Furner (2010) describes ontology as “concerned to identify and understand the fundamental categories or kinds of things that exist in the world” (p. 182). Ontology can be seen as theories about how humans are experiencing the world and giving it meaning. Epistemology is the theory of knowledge: the study of the origin, nature and limits of human knowledge. Furner emphasises the relationship between information and knowledge. He says that some of the philosophical questions in information studies are epistemological questions “motivated by a desire to understand the ways in which information and other information-related phenomena are involved in the processes by which belief can become knowledge” (Furner, 2010, p. 188). The view of the relation between information and knowledge is clarified in section 1.2.1 in the thesis.

A fundamental backdrop for this thesis is social constructivism, which is a position where the reality is constructed by mental processes influenced by social conventions, history and interaction with significantly others (Gergen, 2015). Social constructivism includes both ontological and epistemological positions. One ontological dimension concerns social sciences and questions about the society and its’ basic elements like the relation between social structures and human agency. This project is mainly inspired by Giddens’ structuration theory (1984), which is an ontological framework for social interaction that promotes the idea of a

dynamic interplay between structure and agency, more specifically an equal emphasis between human agency and social structure as a mutually repeating, inseparable duality. Giddens' social structure includes 'rules' (informal and tacit norms) and 'resources' (material equipment and organisational capacities). These structures shape human activity and agency, but can be changed when humans ignore them, replace them, or reproduce them differently in their own activities. The individuals are competent and able to use their knowledge to act and make a difference. This requires an in-depth and intuitive knowledge about the structures, which exist only because they are used and reproduced by the agents. Giddens claims that humans have three levels of action. The upper and most reflective level is 'reflexive monitoring' of what we do, which relates to 'know that' - knowledge: the explicit and conceptual knowledge about the social and physical world. However, Giddens emphasises that human routine actions are based on the middle level; 'practical consciousness' that is our implicit, bodily skills and tacit knowledge or 'know how' - knowledge. The line between the two upper levels is permeable, since competent actors are able to use 'discursive consciousness' or explicit rationalisation to explain their intentions for action. The third, lower level is the unconscious 'motivation of action' which represent our general 'life projects' and the underlying reason for action (Giddens, 1984). Giddens' structuration theory provides some ideas about how to explain the dynamic relationship between people and practices, and how individuals like newcomers in a community may influence and change existing practices.

Giddens does not provide an epistemological theory, but an applicable social constructivist framework is collectivism. Talja, Tuominen, and Savolainen (2005, p. 88) describe this metatheory as "oriented toward a deeper understanding of the practices of professional groups and scientific domains and the tacit knowledge underlying these practices". Information processes are embedded in social, organisational and professional contexts. Collectivism, as a metatheory, is useful for studies of information practices in specific domains like nursing:

> Collectivism takes professions and knowledge domains as its research object and sees the information and communication practices and terminologies of professions and domains as the primary context for information behaviour and knowledge organisation. (Talja et al., 2005, p. 92)

Talja and colleagues compare collectivism to another metatheoretical position, 'cognitive constructivism'. In this view, the individuals are the focus, their information needs and how they seek information. This is the traditional foundation for user studies, user-oriented

information retrieval research and information literacy studies. The first article in this thesis takes this point of departure, however, in the forthcoming chapters it will be analysed from a practice lens to illuminate the deeper understanding underlying the emerging educational information practices. Based on this focus and my concern for professional practice, collectivism seems to be a fitting metaview for my overall project. Other related information studies, which use collectivism as the metatheoretical foundation are for example Given and Kelly (2016), Känsäkoski and Huotari (2016) and Prigoda and McKenzie (2007). Prigoda and McKenzie (2007) emphasise that collectivistic studies "aim at understanding the ways that discourse communities collectively construct information needs, seeking, sources, and uses. The unit of analysis in collectivism is therefore the group rather than the individual" (p. 91). Given and Kelly (2016) elaborate on this point and promote that "using a collectivist approach allows researchers to explore how communities generate, locate and share knowledge at the group level" (p. 2). Känsäkoski and Huotari (2016) underline that "knowledge formation of an individual derives from social interactions and cultural meanings" (p. 324).

3.2 Practice theories in social sciences

This research focuses on practice dynamics, thus, practice-oriented theories are a natural choice of theoretical framework. Such theories also connect strongly with Giddens' ontology and collectivism as the epistemology. According to Reckwitz (2002), practice theories are a subset of social theories. Social theories do not claim to be true, but provide a social-theoretical vocabulary as a heuristic or sensitising framework for seeing and analysing phenomena in empirical research. They are regarded as shaping and changing our self-understanding. Schatzki (2001) points out that practice theorists deal with "…human activity; the nature of subjectivity, embodiment, rationality, meaning, and normativity; the character of language, science, and power, and the organization, reproduction, and transformation of social life" (Schatzki, 2001, p. 10). Schatzki considers practices as the starting point of understanding all human activities, that is, everything that people say and do are determined by practices.

Collective activities and routines are the main concern of this research and practice theories also encompass power relations, unusual incidents and changes, which are of interest here. Practices "…comprise regular, occasional, rare, and novel doings/sayings, tasks, and projects" (Schatzki, 2002, p. 74). 'Doings', 'sayings', understandings, rules and 'teleoaffective

structures' (such as projects, emotions and uses of things that are accepted or prescribed for participants in the practice) frequently change by processes Schatzki names 'reorganisation' and 'recomposition'. Changes can happen in response to different occurrences and can involve borrowing elements or taking inspiration from other practices. Changes may also be due to things, tools and other objects, for example computers. "The doings and sayings […] continually evolve, because of changing circumstances, accumulating experience, bodily peculiarities and shifts in the orders and practices that the actions engage or are a part of" (Schatzki, 2002, p. 242).

Shove and colleagues (2012) are other practice theorists, who are occupied with practice dynamics. They claim that practices change and travel between different contexts due to changes in 'materials', 'competencies' and 'meanings' from which the practices are performed. 'Materials' include objects, tools, technology, bodies and other physical entities. 'Competencies' represent skills, know-how, understandings and techniques, and 'meanings' include mental activities like emotions, motivation, beliefs, purposes and ideas. Practices are defined by interdependent connections between these elements, and people actively combine them in certain ways and thus reproduce a practice. Practices may change when connections between these elements are broken or new connections are made (Shove et al., 2012). The example of nursing practices underlines that as a consequence of new technology (materials), providing easier access to research information, which in turn requires new skills (competencies), these elements may connect to a motivation (meanings) to improve patient care by use of the newest research information. In this case, there are three new elements that make connections with each other, and may lead to a new kind of nursing practice emerging. When regarding the potential for change, it is also important to be aware of the power dynamics in the workplace. Power is distributed to varying degrees between the members of different groups. In this research, it is interesting to look at both power distribution and dynamics between different professions and between newly qualified and experienced nurses.

Thus, specific forms of knowledge are important in practice theories, including 'know-that' facts, but also tacit, collective and shared knowledge in the form of 'know-how' and ways of understanding. Gherardi (2006, p. 97) claims that: "Learning to become a competent member within a culture of practice is a process by which novices appropriate – within a culture of unequal power relations – the 'seeing', 'doing' and 'saying' that sustain this practice" (p. 97). Gherardi emphasises that learning happens when the community is highlighting what is

important through conversations during practice and conversations about practice, as well as by novices watching others doing meaningful activities. The community is supporting the enactment of the new identities of newcomers. However, in some of these theories, the newcomers seem to be rather passively socialised into organisations, and it is highly relevant in this thesis to examine frameworks that include the agency of individuals as well, in accordance with Giddens' ontology.

3.3 Individual agency in practice-oriented theories

Wenger-Trayner and Wenger-Trayner (2015) emphasise that competence is a social phenomenon, since the actual community of practice has to recognise it (cf. conceptualisation of 'knowledge' in section 1.2.1). Competence can shape the individuals' experiences, but also be shaped by it in a dynamic interplay (see my illustration in Figure 3.1). This means that members of a community bring their personal experiences to a practice, which may challenge and change the socially defined competence of the community, that is, the existing definition of competence is renegotiated. However, most commonly the community transforms the experiences of individuals to align with the defined competence.

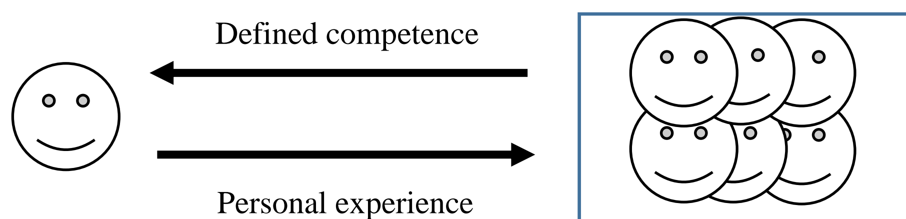

Figure 3.1: The dynamic interplay between newcomers and community of practice

Thus, inconsistencies between experience and competence are constantly renegotiated, and learning to become a practitioner is best understood as:

> [...] developing a meaningful identity of both competence and knowledgeability in a dynamic and varied landscape of relevant practices. [...] Practitioners need to negotiate their role, optimize their contribution, know where relevant sources of knowledge are, and be practiced at bringing various sources of knowledge to bear on unforeseen and ambiguous situations. (Wenger-Trayner & Wenger-Trayner, 2015, pp. 23-24)

Social structure versus individual agency in workplace learning has also been a focus among pedagogical researchers (Billett, 2008, 2014; Fuller, Hodkinson, Hodkinson, & Unwin, 2005; Hodkinson et al., 2004). Billett (2008) and Hodkinson and colleagues (2004) emphasise that learning through work includes workplace affordances, their invitational qualities and how individuals choose to engage with these. Individuals bring their prior knowledge, experiences and skills, which they adapt and develop to their new workplace (Hodkinson et al., 2004). Fuller and colleagues (2005) find that novices in some cases are even considered the experts (having the most up-to-date knowledge) and are passing on this knowledge and skills to their experienced colleagues. These contributions, much like Giddens (1984), emphasise that social and individual agency are relational and interdependent, and that individuals construct knowledge and bring about both individual and social change when employing their capacities, interests and values in work. Billett (2008) urges looking beyond social structures and the situated nature of learning to "include participants' interests, identities and subjectivities and their active role in the workplace's construal, construction and remaking" (s. 55).

3.4 **Practice theories in information studies**

Lloyd (2010b, 2011) has connected the practice theoretical framework to information studies. She uses the concept information landscape to describe the inter-subjectively created, communicative spaces of shared practices, where ways of doing and saying are negotiated and agreed, and where identities and relationships of the members are formed. Information is shared, enabled, valued, constrained and sanctioned in the information landscape (e.g. a workplace). Newcomers have to develop practices, skills and knowledge to access the intersubjective information landscape. They need a kind of map provided by education or preparatory training and guidance by the experienced members within the community. Experienced members, in the workplace context, enact power through discourses and introduce newcomers to the legitimised information and knowledge sites in the domain. While epistemic (objective) knowledge is valued in the educational context, social (tacit) and corporeal (bodily learning) sites of knowledge are often the most valued in practical workplaces.

Lloyd (2010b) uses the term 'information modality' to describe sites of knowledge within a context that includes the epistemic, social and corporeal modalities. 'Epistemic modalities' are the factual and disciplinary know-why and know-that information; information that is expressed

through textbooks, standards, guidelines and procedural documents for practice. The 'social modalities' are knowledge acquired through social interaction and reflection, tacit shared understandings that may contest epistemic information. Experiential information, values and beliefs are the focus of social modalities. This modality is about situated knowledge and institutional learning. 'The corporeal modality' represents the embodied know-how or practical tacit knowledge acquired through sensory input, demonstration and observation of practice. 'Information coupling' is the process where epistemic, social and corporeal sites of knowledge are drawn together. It is also a process through which the individual will become a practitioner and a full member of the community of practice.

In summary; Giddens' structuration theory, which promotes the dynamic interplay and equal emphasis between social structures and human agency, and Talja and colleagues' collectivism, which is focused on the deeper understanding of the practices of professional groups, will guide the analysis in this thesis. Various sub-divisions of practice theory; including concepts within socio-cultural theory, are also applicable to analyse and understand the empirical material. Thus, the emphasis is on examining collective information practices and information culture, which are considered relatively stable phenomena. However, based on the belief that it is too limiting to focus on collective action only, and that the individuals' motivations, values and ability to influence practice cannot be ignored, a multi-level focus has been taken. This includes a focus on the individual level, the group level, and the organisational level, which aims to generate a holistic approach to practices.

4 Methodology

In this chapter, the overall methodology is described and discussed. The three articles in the thesis are based on different parts of the data, which was acquired at different stages of the project and involved different participants and contexts (overview in Table 4.1). However, all three articles concern information practices and culture in nursing. This chapter describes justifications for selecting contexts, the design of the two different studies, ethical considerations, analytical approaches, study quality and finally methodological limitations. Some reflexive and ethical issues are also discussed throughout the chapter.

Table 4.1: Overview of the articles' context, stage, participants, data collection and analysis

Article/RQ	Context/ Stage	Participants	Data collection
Article 1: How do the research skills of undergraduate nursing students evolve as a result of a collaborative library-faculty teaching intervention?	Undergraduate nursing education/ Last three months before graduation and starting to work as nurses	A total of 247 nursing students who graduated between 2013 and 2015 participated	A total of 194 Bachelor's theses were quantitatively and qualitatively analysed (nearly half the students wrote in pairs)
Article 2: How do newly qualified nurses handle inconsistencies between different information modalities in the workplace?	Working as nurses in the hospital/ Based on data collected in the first and tenth month in the hospital	Nurses in the training programme: 12 who started in 2014 6 who started in 2015 Nurses not in training programme: 7 who started in 2014	5 focus groups and 4 interviews (participant observation and meetings were used for validation of data) Them. analysis
Article 3: How do newcomers experience and respond to existing approaches to information use in an organisation? How do newcomers and information practices develop through interaction?	Working as nurses in the hospital/ Based on data collected in three stages: in the first, tenth and twentieth month in the hospital	Nurses in the training programme: 12 who started in 2014 6 who started in 2015	9 focus group discussions in three series, participant observation and different meetings. Thematic analysis

4.1 Study design

4.1.1 Background

Having had fourteen years' experience with personnel development and management in healthcare in a hospital and two years teaching and supervising nursing students in a university library, it was a natural choice to study information practices connected to learning and professional development in these contexts. In both settings, I have been involved with EBP, how to facilitate research use in education and clinical practice and how to transfer these research skills between these contexts. In the hospital in the early 2000s, only physicians talked about research. However, there was a national initiative that started around 2010, mainly among nurses, which aimed to establish and implement EBP procedures in clinical practices. At that time, in nursing education both at a local and national level, students had some training in how to search databases, however, few other aspects of EBP were taught (Nordsteien, Horntvedt, & Holmen, 2013). In response to this perceived gap, a library-faculty intervention was implemented to increase awareness of EBP and to improve the students' research skills in 2012. This included formulation of clinical questions, literature searching, critical appraisal and research application. It was agreed to evaluate the results after three years, which is the basis of Article 1.

4.1.2 The educational study

The aim of Article 1 was to examine students' research skills during a collaborative library-faculty teaching intervention in one single three-year undergraduate nurse education programme in Norway. The textual information sources the students use, how they appraise the information and how and why they use the specific information were investigated. The quantitative data material consists of 194 Bachelor's theses collected from 247 students, who graduated between 2013 and 2015. In total, 58 theses were written in pairs and 131 individually. The students, who graduated in 2013, were exposed to the new teaching intervention only during their final year, while the students who graduated in 2014 and 2015 were exposed to the intervention for two and three years respectively during their programme. The quantitative data contributes to knowledge about the extent to which students are aware of the principles within EBP and what skills they possess in this regard. Additionally, the correlation between grades and critical appraisal skills is assessed along with the thesis criteria. This qualitative analysis

indicates something about what kinds of information and information skills are valued in this specific nurse education programme.

The supplementary qualitative data consists of different justifications of the information related choices the students made. Article 1 provides illustrative examples of the students' ways of reasoning. Thus, the qualitative data collection and analysis are more consistent with the overall social constructivist foundation of the project, since capturing the students' meaning making processes relates to seeking, appraising and applying scholarly information. Thus, it provides a certain insight into the information culture and practices in nursing education. Since the theses analysed are part of the final exam and the most comprehensive assignment in the nursing programme, they are an important information source. Article 1 also reinforces the longitudinal aspect of the thesis since eighteen of the twenty-five new nurses in the later workplace study graduated in 2014 and 2015. This means that many of the participants in Articles 2 and 3 probably participated in the Bachelor's thesis study in the nurse education programme.

Article 1 differs in many ways from the other articles. The context is nursing education, it is published in a nurse education journal and the planned audience was nurses and nurse educators. The article is written in a natural science tradition; there is no explicit theoretical base and the main data collection method and analysis are quantitative. However, the quantitative data was supplemented with qualitative data, which gives additional depth and value to the study (Grbich, 2013).

4.1.3 The workplace study

The workplace study was conducted between 2014 and 2017 and a timeline of the focus groups and interviews are provided below in Figure 4.1. Twelve nurses were recruited to the programme in 2014 and six more nurses in 2015; in total fifteen women and three men aged between 24 and 48. Additionally, seven non-training nurses (women only and about the same age range as the other group) were included in a control group in 2014. The first series included three focus group discussions with four to six training nurses in each group and three interviews with two or three non-training new nurses. These were conducted when most of the newcomers had only been working for a few weeks. The second series included three focus group discussions and one interview and were conducted approximately ten months later. The third series took place at the end of the second year and included three focus group discussions with only training nurses. It was planned that each group would have six participants, but due to sick

leave and maternity leave, the number of participants in the focus groups varied from one series to another. A semi-structured interview guide was e-mailed to all the participants one week before each focus group or interview (Appendix 5).

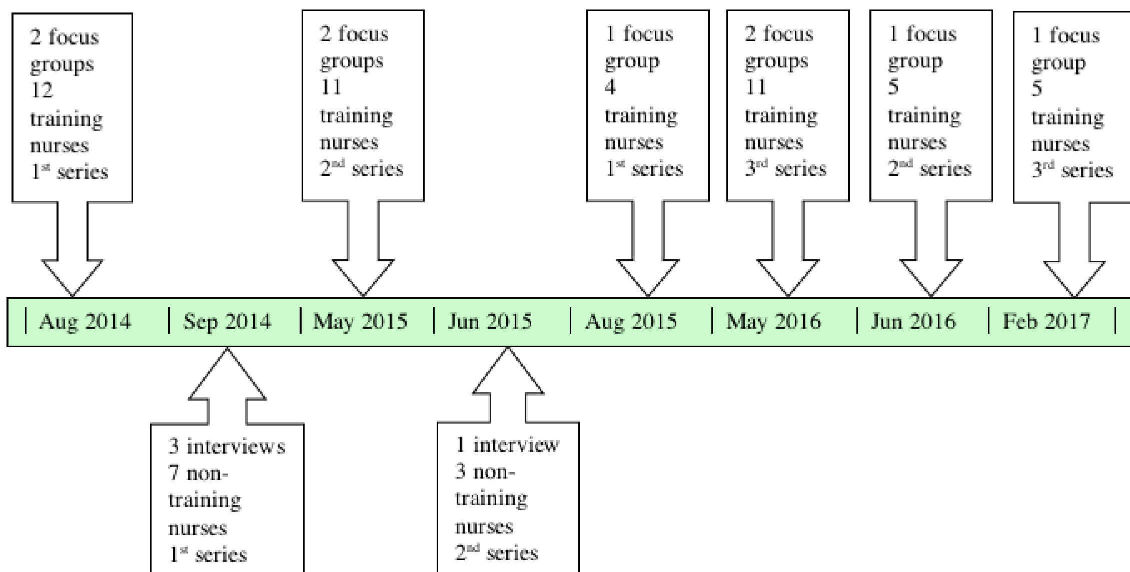

Figure 4.1: Timeline of the series of focus groups and interviews and overview of participants

Getting access to hospitals and healthcare generally to do sociological research can be difficult (Chambliss, 1996) and it is often necessary to identify gatekeepers to gain access (Fangen, 2010). The gatekeepers in this case were graduating nursing students. I asked them where they were supposed to start to work. Several of them told me that they were accepted in a two-year training programme in a specific hospital and even put me in contact with the programme project management, who was planning to do an evaluation of the training programme. I had no previous relationship or conflicting linkages with this hospital. Despite the fact that some of the participants knew me as their former librarian and were my gatekeepers to this study field, I did not know any of them personally. However, several of them knew my face, because I had been teaching and supervising them for three years.

The project management at the hospital saw it as a beneficial opportunity to have an external partner to evaluate the training programme, and I was granted access on the basis that I could contribute in this field and that my presence would not interfere with the clinical patient work in the hospital. This gave me access to observe the entire training programme, evaluation meetings in the hospital, and to talk with the participants on a monthly basis for two years. However, it closed the possibility of observing the participants doing real patient work. Therefore, I was not able to study embodied information practices in the natural setting, which

is important to get a holistic view of information practices. Nevertheless, I was then able to avoid some ethical problems. One of them being that observing newcomers with their patients may be stressful to the nurses and cause errors. Moreover, it is also stressful to very ill hospitalised patients to be exposed to strangers coming into their room, possibly feeling that they have to allow it. An important ethical question is whether observation of clinical work is necessary to be able to answer the research questions, and how the results might benefit the recipient patients.

In this case, I felt fortunate to get the access I did. On one side, I could possibly contribute to the evaluation, which was very beneficial to the hospital and society at large. On the other side, this was a bit outside my scope and it required additional efforts. Among other things, it forced me to write evaluation reports and make presentations of relevant data for evaluation meetings with the hospital management. The study also moved closer to the characteristics of commissioned research and thus I had to be conscious about some ethical dilemmas to ensure the research remained open and independent according to ethical guidelines (The National Committee for Research Ethics in the Social Sciences and the Humanities (NESH), 2016). For example, there were some attempts to try to accelerate the study to get more rapid results. However, I declined on the grounds of the need for thoroughness, but I integrated one suggestion to include a control group in the study. This was to be a group of newcomers, who were not participating in the training programme. I felt this could bring in a new dimension for comparison in the data material. I also agreed to include the next year training nurses, which provided me with even more data and a possibility to compare two groups that were more similar to validate the findings.

Thus, Article 2 included eighteen newly qualified training nurses, who started in 2014 and 2015 and seven newly qualified non-training nurses, who started in 2014. The aim of the study was to focus on information challenges of newly qualified nurses and the potential of training programmes for newcomers in the workplace. The plan was to conduct observation, focus groups and various other activities. It proved to be difficult to gather more than two or three of the non-training nurses at the same time and I consider those encounters to be interviews rather than focus groups, since there was not as much interaction between the participants as with the focus groups. The nurses not participating in the programme worked different shifts, and they were not able to leave their patients during their shifts to do interviews and had to use their free time to participate in the interviews. This made it difficult to complete three sets of interviews

with them and for this reason, the results based on their interviews were not included in Article 3. The aim of Article 3 was to investigate the dynamics between newcomers, communities' information practices and organisational information culture; hence, comparison of newcomer groups was not an area of focus.

Nevertheless, the focus groups as well as the interviews were engaging and the newcomers obviously considered me to be on their side and seemed to talk freely about their situation at the hospital. Some of them actually described the sessions as "group therapy", being able to share experiences with others in the same situation and helping each other to sort out problems. The possibility to share experiences was also the reason for choosing focus groups as the main data collection method in this project. The method also fits well with social constructivism, because the main idea is to construct shared meaning in interaction with other people. Focus groups also work with a naturalistic ethnographically inspired study, since discussing with other people is a natural form of interaction (Finch, Lewis, & Turley, 2014). Thus, the participants quickly seemed to forget the research situation and shared experiences and ideas freely, they discussed and responded to the issues in question amongst themselves without much facilitation. The nurses explained that they are used to discussing issues from the reflection groups during their education. The following description is illustrative of how the focus groups in the study evolved and even came to be considered as a part of the workplace learning in itself:

> Participants ask questions of each other, seek clarification, comment on what they have heard and prompt each other to reveal more. As the discussion progresses, individual response becomes sharpened and refined, and moves to a deeper and more considered level. (Finch et al., 2014, p. 212)

There seemed to be an equal relationship between the participants; however, many of the nurses were more talkative than others, although they all contributed. There were few disagreements. These were mainly based on the different experiences from the different wards. The participants were supportive when listening to each other's experiences and the reported behaviour on each ward. They related to experiences of other, for example, when opposing colleagues' unwillingness to adapt according to new procedures.

The observation part of the study involved participation in all the monthly exercises and lectures in the programme (20 sessions of 6.5 hours each), including a monthly half an hour informal

morning talk about how things were going. I also participated in evaluation meetings with the hospital ward management (two meetings) and the simulation centre (one meeting), as well as three midway follow-up conversations between the project manager and individual nurses in the training programme. I was also granted access to a Facebook-group with the twelve training nurses, who started in 2014. I was excited about what interaction they would have there, however, the group turned out to be not active, and the only information shared there was practical information like where and when to meet for the training sessions and lectures. Additionally, I shadowed one of the nurses at a shift on her ward. This was outside the agreement, I managed however to make an exception due to making an appointment directly with the head of the ward. I chose to keep out of the patient rooms and the direct clinical work. Nevertheless, I was able to observe interactions between the nurses, the physicians and other health personnel. It was also of great value to observe the daily routines and how the nurses communicate on computers and across the hospital departments, with relatives and the community health services. The articles are mainly based on the analysis of the focus group discussions (and interviews in Article 2). However, the observational data has been of great importance to validate findings in the focus group discussions and interviews. Moreover, the observations have been valuable to capture what is going on in the workplace and in the training programme. In this way, I was able to introduce relevant themes to discuss in the focus groups and to follow up on different issues that came up.

4.2 **Ethical considerations**

Ethical considerations in the education study involved mainly anonymity and informed consent. The management of the nurse education programme supported both the teaching intervention and the follow-up evaluation. The students were informed about the study in plenary in the introduction week of thesis writing and told that participation was voluntary. Anonymity was ensured, since the theses only contained a candidate number and the written consents were obtained by the exam office when the students submitted their thesis (Appendix 2). Data about grades was the most sensitive part of the material.

In the workplace study, some ethical issues are already described as they show up during all the steps in a qualitative and interpretative study. One of the most important responsibilities of the researcher is to protect the confidentiality and anonymity of the participants (NESH, 2016).

Newcomers may be considered as a more vulnerable group than other employees, because they have to work hard to be regarded as a full member and to improve their position in the group. Names of the participants were replaced and assigned codes from N1 to N25 and names of the hospital and wards were not transcribed. Additionally, I have tried to avoid using sensitive recognisable examples when presenting the findings. Both external and internal anonymity have to be protected. An information letter about the project was sent to all participants and the hospital management a week ahead of the first meeting, and written consent was obtained from all parties (Appendix 3 and 4). The participants were ensured that they could withdraw their consent at any time. However, I was aware of the potential social pressure to participate in order to feel a full 'member' of the group. For this reason, I checked several times what they felt about participating. Some of them emphasised the previously mentioned therapeutic effect of the group discussions, while others just wanted to contribute to the research, because they considered it important especially with the focus on newcomers. Some also commented that it would be "exciting to read about themselves". However, it is important to be aware of the difficulty of withdrawing consent, especially when you are expected to contribute to the evaluation of the programme as a part of your job, and additionally having dedicated time set aside in the programme to participate.

Another ethical issue about informed consent is that it is impossible to predict exactly what data will be collected and how data will be interpreted in observation studies. Thus, it is not possible to inform the participants or the workplace organisation about all potential negative consequences connected to participation (cf. Atkinson, 2009). Negative findings are always a risk and may not be withheld or selectively reported by the researcher (NESH, 2016). Additionally, I experienced that it was very difficult to explain information research to people outside the information research community, because other terminology is used and often other methods for data collection are preferred. In this case, the training programme organisers would have liked to quantitatively measure the effect of the programme and do a cost benefit analysis. That was not my plan and they were fortunately also interested in the newcomers' experiences and agreed to let me into the programme on those focus premises. The study was registered and approved by the Norwegian Social Science Data Services (Appendix 1), which is the 'Official Data Protection for Research', representing most public institutions in Norway. There was no need to report the study to The Regional Committees for Medical and Health Research Ethics (REK) as no patient data was collected.

4.3 Analytical approaches

4.3.1 Quantitative analysis of the educational study

SPSS version 24.0 was used to conduct the statistical analysis. It was necessary to make a codebook and decide which variables to include. We (the article authors) wanted to get a complete picture of what information and information sources were used and started by scanning the methods sections and search records used in the theses. All types of textual information and sources were included in the codebook. Additionally, we wanted to register how critical appraisal had been conducted, what EBP-tools were mentioned, the number of databases and articles that were used and the related grades. A translated excerpt of the codebook is provided in Table 4.2. Two of the authors coded half of the theses in each year for three years. It was important to make descriptions in the codebook of what to include and exclude in order to code consistently. Every tenth thesis was exchanged to check for intercoder reliability. This proved to be 0.84. In three cases there was some disagreement relating to what to code where, all the codebooks were readjusted to what was agreed. The information we were looking for is described in the methods sections, but we additionally checked the search records, reference lists and used the search function in Word to double-check our results. The punching of codes in SPSS was also double-checked, and the third author, a statistician, was studying the data to detect possible errors. Simple descriptive statistics were made, as we initially wanted to establish what percentage of the students from our sample used the various information types and sources and how this developed between 2013 and 2015. Next, we made cross tables to find possible correlations between variables, especially between grades and any other variable to be able to deduce something about what counts towards getting a good grade. The Pearson chi-square test was used for this statistical analysis.

Table 4.2: Excerpt of codebook

Variable	Information type/ source	Description	Yes	No
1	Point-of-care-tools	UpToDate, BestPractice, manuals, drug databases	1	0
2	Guidelines	National guidelines and procedures	1	0
3	Research syntheses	Reviews, syntheses	1	0
4	Primary research article	Original research	1	0
5	Governmental documents	White papers, Official Norwegian Reports	1	0
6	Legislation	Acts like Patient`s Rights Act	1	0
7	Occupational ethical guidelines	ICN code of ethics for nurses	1	0
8	Non-research articles	Professional journals	1	0
9	Webpages	Governmental or professional organisations	1	0
10	Webpages	Other private	1	0
11	Google	Google, Google Scholar	1	0
12	PubMed/Medline	(All used databases are listed)	1	0

4.3.2 Qualitative analysis of the education study

The Bachelor's theses examined included approximately 6000 text pages. We wanted to find some examples of how the students justify their selection of information to supplement our quantitative data and decided to use NVivo. To make it simple and feasible, 25% of the theses from each submission year were randomly selected, that totalled 49 theses. A second reading was conducted, and the student descriptive rationales were coded into three main categories of interest (cf. Bazeley & Jackson, 2013): use of information sources, types of literature and EBP-tools used.

4.3.3 Qualitative analysis of the workplace study

Articles 2 and 3, which represent the workplace studies, are based on qualitative methods only. Article 2 presents the early findings from the newcomers' first year in the hospital, and the data material consists of two series focus groups and interviews with the nurses, who started in 2014 and one focus group with training nurses, who started in 2015. In total, five focus groups and four interviews that lasted about one hour each (the time that was allocated in the programme). These were all digitally recorded and transcribed verbatim in Norwegian, resulting in 170 pages with 1,0 spacing (each transcription was about 20 pages). The transcriptions were imported into NVivo 10, which was used to guide the analysis.

The first series of qualitative data collection involved questions concerning how the nurses use different information sources to cope with the theory - practice gap and the transition between education and workplace (Appendix 5). Inspired by previous research and theories regarding information practices of health care personnel, I started out with some concept-driven codes (cf. Gibbs, 2007): epistemic, social, bodily information and information coupling (Lloyd, 2010b), which were applied during the first reading of transcriptions. Moreover, open codes like identity, experience, change and learning were named throughout this first reading and applied during a second reading. Code descriptions were made for each code in NVivo to improve the consistency of applying codes (Appendix 6), and notes were written about thoughts of relationships between the codes and possible patterns in the data. A pattern of the challenging behaviour of the training-nurses was very evident. This came out in the discussions, the transcription process and the readings of transcripts. This impression of their behaviour was reinforced and confirmed at several monthly meetings with the training-nurses, especially during the half hour morning meetings, where they shared experiences. Thus, this theme was further elaborated in the second focus group series. Building on this, codes like trust, distrust, opposing, questioning, substantiating and aligning were added. At this stage, I had about 40 different codes, and I tried to merge small codes into broader and sometimes more analytical codes and to sort them into categories in a hierarchy. The structured coding system of Bazeley (2013, p. 182) was used as an inspiration for ordering and describing categories. After reorganising on the basis of feedback from research colleagues and reviewing the coding to double check the consistency, the codebook in Appendix 6 was established. An excerpt from NVivo is shown in Table 4.3 (it includes the references from the first five focus groups only):

Table 4.3: Excerpt of codes and categories in NVivo

Nodes

Name	Referenc	Created On	Created By
Information strategies	0	11.05.2016	AN
Bodily information	34	12.05.2016	AN
Epistemic (theory and research)	38	12.05.2016	AN
Epistemic (procedures)	43	12.05.2016	AN
Social information	31	12.05.2016	AN
Outcome	0	11.05.2016	AN
Compliance	4	12.05.2016	AN
Facilitators for learning	16	13.05.2016	AN
Barriers for learning	16	13.05.2016	AN
Challenging	28	12.05.2016	AN
Transition of practices	27	12.05.2016	AN
Personal qualities	0	11.05.2016	AN
Integrity	19	12.05.2016	AN
Motivation of learning	33	12.05.2016	AN
Change agent	32	12.05.2016	AN
Identity	11	12.05.2016	AN
Organisational culture	0	11.05.2016	AN
Support	14	12.05.2016	AN
Interprofessional relations	28	15.05.2016	AN
Management	43	12.05.2016	AN
Sanctions	17	12.05.2016	AN
Trust	25	12.05.2016	AN

The most prominent categories were information needs, information strategies, information outcomes, personal qualities and organisational culture. I tried to arrange the relationship between the categories in a model (Figure 4.2). The code that got the highest number of references (61) was 'Information needs' (not shown in the excerpt). Thus, the nurses often talked about information needs. The information strategies they used to solve these needs were divided into two kinds of epistemic information: theories and research (external information) and procedures (internal information) in addition to social and bodily information. As shown, references to epistemic information largely dominated. There was constant discussion about what information to trust and what not to trust, this tended towards trusting epistemic information and distrusting oral information from colleagues or observation of the practice of colleagues. The outcome of distrusting information was challenging (questioning, substantiating or opposing) the practices and trying to negotiate a change of the actual practice. In direct contrast to this, there was trust, compliance and preservation of an existing practice.

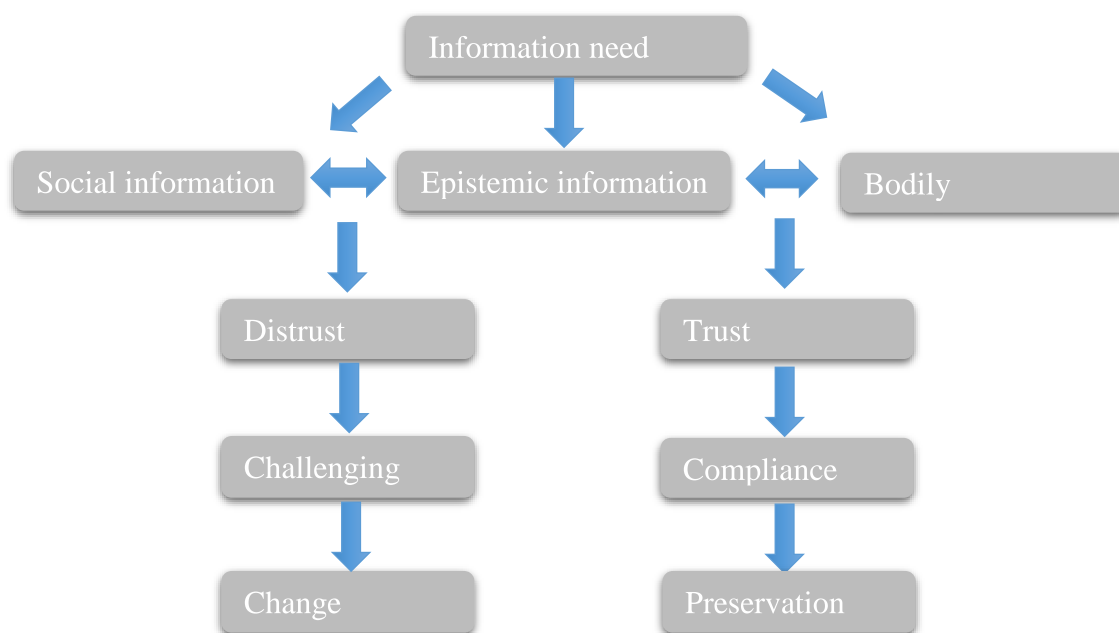

Figure 4.2: Relationship between the categories in first part of the study

Thus, the main overall theme that appeared through this process was the handling of conflicting information from different information modalities. To take the analysis a step further to the second level, it was recommended to develop a matrix (Miles, Huberman, & Saldaña, 2014). The matrix in Appendix 7 displays typical statements or a condensed meaning of statements, and this makes it possible to compare the qualitative data across the focus group and interview series and the two different groups of nurses. The matrix indicates that training-nurses sometimes distrust social information and criticise practices to a greater extent than the non-training-nurses, and this leads to opposite situations in terms of complying with practice. In Article 2, three sub-themes were defined: reliance on information (including the initial codes trust and distrust), challenging practice (including the initial codes questioning, opposing and substantiating) and complying with practice (including the initial codes aligning and complying).

In Article 2, the findings were presented and discussed in a format inspired by the interpretative framework of Brinkmann and Kvale (2015) shown in table 4.4. This consists of three interpretative levels of increasing abstraction: self-understanding was used to represent the condensed meaning of the participants' statements; a critical common-sense understanding was taken to mean critically interpreting the content of statements or what statements may tell about

the participants; a theoretical understanding was seen as connecting statements to theory. The example from Article 2 is given below to demonstrate how information was used.

Table 4.4: Interpretative framework

Self-understanding	Critical common-sense understanding	Theoretical understanding
The new nurses related that they were impressed with the way their skilled colleagues handled critical situations very quickly: “their hands just seem to know what to do and what will work”	Complying with practice. Experienced nurses as role models in critical situations	Social structure: Competence of community. Deep intuitive understanding. Corporeal information modality
Member validation	Audience validation	Peer validation

According to the framework in Table 4.4, validation of the study should be done by discussing each of the three different understandings with participants (member validation), general public (audience validation) or the research community (peer validation). Member validation of the main findings of this study was conducted through a meeting with the participants. The training-nurses confirmed what information they rely on and in what situations they respectively challenge or comply with practice. Audience validation was conducted through evaluation meetings with the training-nurses’ managers and trainers, who were enthusiastic about the new epistemic impulses the training-nurses brought to their wards and their positive impetus to substantiate practice. Peer validation was conducted by presenting and discussing the findings with both nursing and information science researchers.

When the time came to conduct the last series of focus groups and write Article 3, the coding in Appendix 6 and Table 4.3 was revisited. Codes connected to organisational culture were another pattern included in this material, which I wanted to bring out and examine. While Article 2 was focusing on the relationship between the newcomers and the professional community, a focus on organisational culture connected to information issues seemed to be a natural further step. Thus, the third series of focus groups raised questions about these cultural aspects in relation to information practices. Additionally, I wanted to highlight the longitudinal

aspect of the study, since I was going to conduct a series of three focus groups with the training nurses. Therefore, questions related to the nurses' professional development were included. As previously mentioned, having only one or two interview series with the non-training nurses, they were not included at all in Article 3.

I searched the literature for a relevant analytical framework, which could connect information practices to organisational culture and I discovered the concept 'information culture'. There were several frameworks of different aspects of information culture (Choo, 2013; Curry & Moore, 2003; Hansen & Widén, 2016). However, as I felt most connected to issues around values and attitudes, a framework developed by Marchand and colleagues (2001) bringing together "information behaviors and values capability". This framework consists of information integrity, formality, control, transparency, sharing and proactiveness. These areas connected to several of my codes: integrity, epistemic information, management, inter-professional relations, support, social information, change and transitions of practices. On the basis of this framework the material was recategorised into the six categories of Marchand and colleagues and was used to guide the presentation of the findings in Article 3.

Table 4.5: Coding information culture in Article 3

Nodes

Name	Files	References	Created On	Created By
Control	2	18	11.03.2017 10.34	AN
Formality	9	96	02.02.2017 14.27	AN
Integrity	8	41	02.02.2017 14.31	AN
Proactiveness	9	68	02.02.2017 14.29	AN
Sharing	9	104	02.02.2017 14.30	AN
Transparency	5	25	02.02.2017 14.32	AN

According to the numbers of references assigned to each of the codes, 'information sharing', which in this framework means to collaboratively provide others with information, was the most dominant theme in the focus groups. 'Information formality', the use and trust of institutionalised information over informal information, was a close second. 'Information proactiveness', which is about absorbing new information and putting it into action, was third and fourth was 'information integrity', principled and trustful use of information. Thus, the overall dominant codes here seemed to be consistent with the findings in Article 2. There was even a statement made in the material used in Article 2, which pointed to a relation between all four main themes identified in Article 3: "The training-nurses share the newest epistemic information with their colleagues in everyday situations […]".

4.4 Methodological considerations

Several issues of research quality have already been discussed. However, to review the study more systematically, certain quality standards are important to consider throughout the entire research process. These standards may be referred to as objectivity, reliability, internal validity, external validity and utilisation (Miles et al., 2014), some aspects of which overlap.

Objectivity is dependent on the role and perspectives of the researcher, for this reason, it is important to be explicit about possible researcher biases (Miles et al., 2014). My background in health care management and academic librarianship leading to my keen interest in the promotion of EBP has previously been described and could potentially influence the findings in both the education and workplace studies. Most importantly, I had to be aware of the possibility of over-interpreting findings or interpreting findings in a desired way. For this reason, it has been important to discuss the findings with the participants, people working in similar practices and in research groups. Additionally, the preconceptions for the studies have been tested and challenged by the reading relevant research and related theories. Participating in four doctoral workshops at different international information conferences and other PhD courses and workshops during the PhD work has been very valuable. It was stimulating and challenging to be able to discuss my work in international forums. I experienced that being challenged by co-authors, who often have different views is also useful. It was a strength in Article 1 to have a sociologist and statistician among the authors, who were not familiar with EBP and asked critical questions that were discussed during the entire research process. In these ways, you become more open to different views and arguments and the risk of researcher biases decreases.

Reliability is closely connected to objectivity and considers the consistency and stability of the study across researchers and methods (Miles et al., 2014). Firstly, I have experienced that detailed descriptions of codes used in the quantitative codebook as well as qualitative codes in NVivo are essential for the consistency of coding. The intercoder reliability was high in the quantitative part of the study, but cross-checking work could have been saved by making the descriptions more precise. Regarding the qualitative data, doing the transcribing myself, checking transcriptions for mistakes, checking codes and doing recoding when necessary, improved the reliability of the data.

Internal validity is about the authenticity and the credibility of the findings (Miles et al., 2014). A number of factors in this study contributed to the validity. Firstly, knowing both contexts of the study from inside including the conceptual language may reduce the risk for misunderstandings and asking precise questions. Secondly, selection of study design proved to be important in different ways. The longitudinal design made it possible to follow up on focus group discussions and observations over two years. I was able to talk to the participants and their trainers and managers about possible interpretations.

Triangulation of methods was another important process; following up themes that emerged in the observations in focus group discussions and vice versa. In Article 1, the qualitative data deepened and supported the quantitative findings. Moreover, having two groups of training-nurses in two different years, asking the same questions and having similar findings, made the findings more credible. Thirdly, being transparent and thorough in describing all parts of the methodology and analysis was important. Thus, several quotes are provided in the articles to allow the reader to follow the interpretations and how conclusions are drawn from data. Finally, the findings seem to be reasonable in the light of established theories presented previously.

External validity is based on the generalisability and transferability of findings to other contexts (Miles et al., 2014). All three articles are based on specific interventions. The teaching intervention and the findings in Article 1 should be transferable to other areas of education if the teaching is adapted to the actual context. The workplace training programme seems to make a difference to how the newcomers deal with information and could have similar results if implemented in other workplace contexts and professions with the same preconditions. In this case, several nurses applied to participate in the programme and about 25 percent were accepted. Thus, the participants were selected on the basis of certain criteria and regarded as highly skilled in theory as well as practice. However, I discussed the results with ward managers in other hospitals, who said that they also experience newcomers challenging the existing practices with their new knowledge, even without the support of a training-programme. Nevertheless, some of the findings are unlikely to be found in occupations that are more hierarchical and especially not in workplaces in countries not having the same relatively equal relations within and between professions. As discussed in other parts of this thesis, some of the findings may be generalised at a theoretical level, but in practice context is important.

Utilisation is about the value and usability of the study to different actors (Miles et al., 2014). The first part of the study has attracted the interest of several nurse educators as well as medical

librarians nationally and internationally. Generally, methods for teaching EBP engage a broad audience. The findings in the workplace study have primarily been significant for the actual hospital and the professional nursing practices there, however, the hospital has also promoted the findings at national health conferences and similar training programmes have emerged. For the first two years, the training programme was a pilot project. However, based on the findings of this research, the hospital decided to enrol twelve new nurses every year and additionally to offer a one-year mandatory competency programme to all new nurses. In a press release about the programme, the hospital maintains that they intend to increase the new nurses' mastery and safety in their professional role, improve the quality of the work, reduce turnover and increase the reputation of the hospital. The study also had positive effects for the participants, as previously described, being able to discuss their experiences and learning processes in focus groups.

5 Findings

In this chapter, the articles' place in the thesis and their publication status are described, in addition to the main findings and discussions in each of the articles (Overview in Table 5.1). The articles' theoretical and methodological frameworks are described in the respective chapters in this thesis introduction. The articles are all part of the longitudinal study and chronologically presented. The articles demonstrate the nurses' transition from students to novices to competent nurses.

Article 1 was published in 2017 in Nurse Education Today, which was in the top ten cited nursing journals with a journal impact factor at 2.533 at that time. The journal is from Elsevier and is indexed in the most important health databases. The intended audience was nurses and nurse educators. The publication strategy was to disseminate information research in a different research area and to a broad audience.

Article 2 was a conference paper accepted for Conceptions of Library and Information Science (CoLIS) 2016, which in 2017 was published in the Conference Proceedings of Information Research. The acceptance rate at CoLIS was 55% that year. In the PhD programme in Library and Information Science, it is expected that candidates should present the research in an international conference. CoLIS was chosen, because of the possibility it offers to disseminate the research to a broad audience within LIS.

Article 3 was published in Journal of Documentation in 2018. The publication strategy in this case was to choose one of the most highly recognised journals within Information Science, being indexed in several important databases and having a broad audience. The journal is on level 2 on the Nordic List, which means that it is considered as a leading journal and to be among the 20% best journals in its research field. PhD students in Norway are encouraged to try to reach a level 2 publication during the programme.

Table 5.1: Overview of the three articles in the thesis

Title (journal)	Research question	Empirical data	Main findings
Use of research in undergraduate nursing students' theses: A mixed methods study **(Nurse Education Today)**	How do the research skills of undergraduate nursing students evolve as a result of a collaborative library-faculty teaching intervention?	A total of 194 Bachelor's theses were quantitatively and qualitatively analysed	The article demonstrates what kinds of information are valued in a Bachelor's thesis. A collaborative library-faculty teaching intervention has been successful in the promotion of nursing student research skills according to the EBP principles. Writing a thesis in the undergraduate nursing programme is important to develop and practice research skills.
Handling inconsistencies between information modalities - workplace learning of newly qualified nurses **(Information Research)**	How do newly qualified nurses handle inconsistencies between different information modalities in the workplace?	Focus group interviews during first year at the workplace	New nurses want to use reliable up-to-date epistemic information. This information is shared with their co-workers, who in turn share experiential information about how to handle atypical or critical situations. This exchange of information allows mutual learning between experienced and new members in practice. New nurses are both tutors and learners. Transition of practices is enabled when the new nurses are supplementing or countering them.
Newcomers' information practices and information culture: a qualitative case study in a health care context **(Journal of Documentation)**	How do newcomers experience and respond to existing approaches to information use in an organisation? How do newcomers and information practices develop through interaction?	Focus group interviews during the two first years at the workplace Observation	This article demonstrates how new nurses interact with colleagues' information practices and information culture viewed as organisationally supported approaches to information use. The article identifies the dynamics between three agencies; individual agency (newcomers), social agency (existing information practices) and organisational agency (information culture).

5.1 **Article 1**

Nordsteien, A., Horntvedt, M.-E. T., & Syse, J. (2017). Use of research in undergraduate nursing students' theses: a mixed methods study. *Nurse Education Today, 56*, 23-28. https://doi.org/10.1016/j.nedt.2017.06.001

The aim of this article was to evaluate how a collaborative library-faculty teaching intervention affected nursing students' research skills when writing their theses. In this article, research skills were operationalised as being able to ask clinical questions, do literature searches and appraise the literature critically based on the EBP framework. Experiential and patient-related information are supposed to be of equal significance as research-based information, however, use of research are considered as the main barrier to implement EBP, which is regarded as an indispensable part of nursing practice today. The main characteristics of the teaching intervention were collaborative teaching by librarians and nurse educators, a systematic integration of the teaching in the curriculum, repeated sessions and supervision throughout the three-year education, teaching content connected to assignments involving realistic patient cases, teaching information sources used in clinical practice as well as traditional research databases and finally workshop-based searching in groups.

The collaborative library-faculty teaching intervention proved to be successful in the promotion of nursing students' research skills according to the EBP principles. Still, the students proved to use a great variety of information sources, in which legislation and ethical guidelines were as important as research articles. There were also some examples of use of social or experiential information by searching Google and YouTube for subject experts and in several cases including patient-related information by introducing patient stories and clinical problems. Thus, the students seemed to be aware of the three different aspects of EBP. The article demonstrates what kinds of information and skills that are valued in this Bachelor's thesis and points forward to the workplace study by asking what will happen with these skills when working as a nurse in the workplace. Some of the students who participated in this first study also participated in the workplace study, and were thus followed through three years in total.

5.2 **Article 2**

Nordsteien, A. (2017). Handling inconsistencies between information modalities: workplace learning of newly qualified nurses. *Information Research, 22*(1), CoLIS paper 1652. Retrieved from http://InformationR.net/ir/22-1/colis/colis1652.html

The aim of this article was to empirically examine information challenges of newly qualified nurses in transition between nursing education and the workplace and hence the potential of training programmes for newcomers in the workplace. A group of twelve new nurses participating in a workplace training programme was compared with a group of seven new nurses not participating in the programme to reveal possible differences in information-related activities. Three sub-themes emerged: reliance on information, challenging practice and complying with practice. The article also includes findings on how, when and why the new nurses handle contradictory information.

Research-based procedures are considered the most legitimate information source. The training nurses also base their performance on epistemic information from the training programme as well as their education. Owing to time constraints and expectations, colleagues are often consulted by both groups of new nurses. However, the training nurses experience that colleagues are often not up-to-date and double-check against textual sources, while the non-training nurses most likely choose to trust their experienced colleagues. Challenging practice is seen in the actions of the training nurses, who challenge, question and substantiate existing practices by acting according to what they have learnt and trying to make colleagues change their habitual practices if required. Training nurses explained that they want to live up to their own professional standards. The non-training nurses also question practice, but do not want to confront their experienced colleagues in the same way. Complying with practice involves both groups of nurses complying with ward routines and their colleagues' practices of handling critical situations. Both groups of new nurses acknowledge that they have to be exposed to several critical situations to be able to act in such an automatic manner. In such situations, there is no time to read textual information. However, the training nurses express less concern about such situations, because they have been exposed to different simulation situations during their training programme. In the programme, they also become familiar with new tools used in the hospital and promote them amongst their experienced colleagues.

5.3 **Article 3**

Nordsteien, A., & Byström, K. (2018). Transitions in workplace information practices and culture: the influence of newcomers on information use in healthcare. *Journal of Documentation, 74*(4), 827-843. https://doi.org/10.1108/JD-07-2017-0116

The aim of this article was to empirically investigate the practice dynamics between newcomers, communities' information practices and organisational information culture. In this case, newcomers represent individual agency bringing new knowledge, experiences and skills to the workplace. Information practices, represent the social agency, involving information related activities and skills among informal professional communities and may be considered as manifestations of values, rules and norms that are core aspects of information culture, the organisational agency. These core aspects are referred to as *approaches to information use* in this article, and six approaches are defined: information integrity, formality, control, transparency, sharing and proactiveness. All dimensions are dependent on the previous one, starting with integrity.

Information integrity, which involves seeking, sharing and using accurate information in a trusting and principled manner, was a dominant cultural trait in the hospital. However, colleagues did not always practice as they expounded, and the new nurses tried to preserve and enforce integrity in ward information practices. Information formality is the preference of institutionalised information over informal sources. The procedure manual was considered the most reliable or "correct" information source, among handbooks and guidelines. The training nurses reassured themselves with the procedures, because they did not always trust what colleagues told them. They also tried to encourage their colleagues consult the correct sources. Information control is about managing people's performance and information transparency involves openness in error reporting. These dimensions were often missing, and the new nurses wanted to change this culture and create space for a more open work environment. However, the workplace culture was characterised by continuous and mutual information sharing between different occupational groups; the professional hierarchies are changing. Research findings were often shared between the groups as well as with the patient concerned. Information proactiveness involves the process of finding and using new information in response to changes. The new nurses were concerned about how to motivate colleagues to use new procedures and tools and to create an environment for mutual learning.

6 Discussion

In this chapter, the findings of the three articles will be discussed jointly in the light of previous research and conceptual and theoretical frameworks. The aims of the thesis were to explore newly qualified nurses' information experiences and approaches towards information practices and culture during their education and in the workplace, and to examine how these newcomers, information practices and culture mutually interact and develop over time. The discussion is organised in accordance with the four research questions in the thesis. Finally, some limitations of the study will be discussed.

6.1 Information practices in nursing education

The first research question considers the characteristics of information practices and culture in nursing education, based on analysis of the final Bachelor's thesis. Insight into information practices and culture in nursing education provides an impression of what types of information are valued in the educational programme and the newcomers' potential skills, preconceptions and attitudes towards information at the time of being introduced to the workplace. The newcomers are carriers of educational information practices (cf. Reckwitz, 2002).

As was found in Article 1, which focuses on the educational context, EBP pervades the Bachelor's thesis requirements as well as the requirements of another large project during the clinical placement in the last year. This has been described in chapter 1.1. In the clinical project, the students learn to find, appraise and apply scientific information and to integrate it with contextual information, clinical expertise and observations of patients (cf. DiCenso et al., 2005), as is the requirement of EBP. This project is an example of how not only theoretical information is appreciated in the educational programme, but also emphasises the need to use information sources from the workplace. In writing the Bachelor's thesis, the different elements of EBP are not easily reflected, since the project requires the students to include a literature review, the theory and scientific information are brought to the foreground. However, there are several examples of theses that refer to patient cases in a specific context, which relates to information regarding the clinical context, the patient's clinical state and patient preferences. Legislation, policy documents and ethical guidelines are included in most theses, which demonstrate an

awareness of the context and the patient's rights. Some theses even search for expert information. EBP is often used by the students as a rationale for the selection of information sources. All these points indicate that EBP thinking has a strong influence on educational information culture and practices.

EBP is thus not only concerned with scientific information, as implied by several sceptics (such as Timmermans & Berg, 2003). The strength of EBP is precisely that it draws on different kinds of information, which are supposed to have equal importance (cf. DiCenso et al., 2005). However, one of the barriers to EBP is the ability of healthcare personnel to find, evaluate and use research (DiCenso et al., 2005; Straus et al., 2011). For this reason, the library sector has been given the task of teaching these skills in health education and in hospitals. In hospitals, a librarian participates in the interdisciplinary team and conducts the systematic literature searches in accordance with guidelines for EBP. Much effort has been made to upgrade the scientific information dimension of EBP, perhaps at the expense, in some instances, of less focus on other dimensions.

To some extent, the dimensions of EBP seem to coincide with the information modalities or sites of knowing of Lloyd (2010b). The epistemic site of knowing includes research evidence, the social site of knowing includes clinical expertise and the physical site of knowing relates to the patient's clinical state, listening to the patient's desires and using clinical skills to acquire relevant physical information. However, Lloyd's sites of knowing are broader than the dimensions of EBP. EBP defines more strictly, what information to use, what clinical expertise to consult and how to make decisions based on the information. Clinical expertise in EBP involves people in an interdisciplinary team, who have the professional responsibility for the actual diagnosis or problem. Thus, this expertise often combines the formal education and work role, which does not necessarily coincide with the understanding of expertise in the introduction chapter.

The first focus group discussions, when the trainee nurses start in the workplace, indicate something about the information culture in education. The newcomers' information practices and attitudes to information are manifestations of educational information culture (cf. Choo et al., 2008). Several quotations in Articles 2 and 3 demonstrate that the newly qualified nurses have strong beliefs about who they want to be as professionals. They express that they want to be skilled professionals, having the most up-to-date theoretical information and doing what is "justifiable and right" according to that information. They emphasise that they themselves have

the responsibility to acquire the needed information, and that it is not satisfactory to rely on information from colleagues alone. This may be expressions of ethical and critical attitudes to information from the educational training. Finding the best and most up-to-date information and critically appraising it constitute some of the focus of EBP teaching in nurse education, and these attitudes seem to be transferred to the workplace context, even when facing some resistance from colleagues in the workplace.

6.2 Information practices and culture in the workplace

The second research question considers what characterises information practices and culture in the workplace according to the experiences of newly qualified nurses. This question is important to provide insight into how different types of information are valued in the workplace, how to support the information needs of newcomers and how to manage and develop the organisation.

Firstly, the experiences of the newly qualified nurses are affected by educational information practices, and their transition between education and workplace is often said to involve a practice theory gap. The educational programme is criticised as being mainly focused on textual information and social and physical information are considered as more prominent in the workplace context (e.g. Lloyd, 2009). As previously indicated, this division has become increasingly blurred as teaching practices have diffused across the contexts. Workplace training programmes for newly qualified nurses with lectures and simulation exercises constitute an important example for bridging this practice/theory divide (cf. Edwards et al., 2015; Al-Dossary et al., 2014). Additionally, the new nurses related that the wards were having lunch meetings to promote professional development, and all nurses were regularly allotted days for professional development as well as mandatory e-learning courses. However, the workplace is complex and several different information practices seem to co-exist, which makes the transition between the contexts more difficult. The newcomers have to learn how to navigate in the new contexts.

A workplace is a landscape of different communities of practice (cf. Wenger-Trayner & Wenger-Trayner, 2015), and several communities emerge across the data material. First of all, the training nurses themselves appear to be a community of practice even if they are not working closely together. The ‘mutual engagement’ consists of interacting and learning together in the

training programme. They exchange information about their experiences from their wards, discuss the meaning of different situations and how to deal with them. They support each other's identity formation, and their conceptions of who they want to be as professionals are strengthened. A 'joint enterprise' involves taking common responsibility to promote new tools, new procedures and up-to-date scientific information providing the best patient care possible. The training nurses have a 'shared repertoire' in the form of having learnt the same tools, procedures and how to perform in various situations through the training programme, as well as drawing on common information practices from their education. Being their own community of practice makes them a strong actor in the practice landscape, and they notice that they are acknowledged and even being listened to for being up-to-date on the newest information and having information skills. Having the support of a group, makes it easier to oppose and substantiate existing practices. The non-training nurses are not part of such a group, but have to seek membership in a community on their ward, in which they become socialised.

There are also several communities on the wards. Two main nursing communities emerge through the training nurses' stories and relate to the two nursing discourses of Johannisson and Sundin (2009) and Bonner and Lloyd (2011), where they refer to the newer nursing discourse versus the traditional medical discourse. Nurses who are preoccupied with professional and scientific information represent the newer nursing discourse. In the hospital, several experienced nurses promoted EBP, and the training nurses experienced that searching, using and sharing scientific information were relatively common among nurses. They often overheard their colleagues referring to research to other nurses as well as to patients. These were clearly role models for the training nurses. The medical discourse involves nurses who are preoccupied with medical information used in daily patient care. Social and bodily information are more important in this discourse. The training nurses experienced that some nurses were negative to new procedures and changes in general and that they did not act according to the procedures, were not up-to-date and were giving incorrect answers to questions. It is unclear what community of practice these experienced nurses belong.

The hospital management may be considered as another community of practice. They have the responsibility for all procedures and other internal information being up-to-date. They expect all employees to keep themselves abreast of new information through the dissemination of newsletters, e-mails, Intranet news and e-learning courses. Some of the new nurses received several guidelines to read before starting to work on the ward. The management urges adverse

deviation from procedures to be reported as errors. However, the new nurses complain that they see no feedback and action after reporting. They also miss some visibility and encouragement from the management generally. It is evident that this affects the information practices; with fewer errors being reported. It may also cause nurses to lose some of the inspiration to make improvements and learning opportunities. According to Marchand and colleagues (2001), this missing element in the information culture elements may result in a less proactive organisation, which affects the ability for innovation and change.

Nevertheless, epistemic and especially scientific knowledge seem to have more impact and acceptance than reflected in some of the previous studies of nurses' information practices. This finding confirms the findings of Spenceley and colleagues (2008), who explain that EBP contributes to narrowing the gap between research and practice.

6.3 Interaction between three levels of information agency

The third research question considers how newly qualified nurses interact with existing workplace information practices and information culture, and based on this, how these three develop through interaction. As illustrated in Figure 1.1, information culture operates at the organisational level, however, this does not mean that the entire organisation consist of one culture. Information culture may differ on the organisational sub-level (e.g. departments or even organisationally organised teams). Information culture surrounds and mutually affects the information practices at the community level. Individuals operate at the inner level, mutually interacting with the other two levels.

The training nurses clearly take a proactive role and ask challenging questions of practice. The main issue for them is to promote an open culture and practices that are based on the newest information in order to provide patients with the best possible care. In this regard, they take on the role of tutor and emphasise both information seeking skills acquired from their education and the role of the workplace training programme in providing new information. Sharing new information with colleagues, they sometimes succeed in revising and adapting habitual practice. This manner of challenging and improving can mutually transform both newcomers and community as was highlighted by Paré and Le Maistre (2006). Firstly, this may be understood as renegotiation of practice according to Figure 3.1., where the newcomers bring their personal

experiences and various sources of knowledge (Wenger-Trayner & Wenger-Trayner, 2015; Hogkinson et al., 2004). Individuals choose how to engage with workplace learning affordances (Billett, 2008; Hodkinson et al., 2004) and apply their capacities, interests and values to bring about mutual change (Giddens, 1984).

Secondly, the relation between newcomers and community may also be understood in terms of Giddens' (1984) three levels of action. Promoting the most up-to-date 'know that' knowledge, involves the upper reflective level, in which information with the middle level is exchanged. In this way, the routinised practical consciousness or the bodily, tacit, 'know how' knowledge is reshaped. The lower level is the unconscious motivation for action. This gives rise to further related questions - Do the new nurses deal with research information to provide the best possible care as claimed, or do they want to promote professional interests and enhance their occupational status as found by Sundin (cf. Johannisson & Sundin, 2009; Sundin, 2003; Sundin & Hedman, 2005)? There are probably various motivations among both new and experienced nurses, and there may be several simultaneous motivations. Some alternative motivations that were implicit in the present data material included the possibility to enrol in a Master's programme and eventually attain a position within professional development or management. In this way, the newcomers' information practices may be opening new personal doors.

Thirdly, it is important to understand how practices change and may travel between different contexts such as education and the workplace. Schatzki (2002) emphasises that changes can happen by borrowing elements from other practices. One concrete example is simulation training, which is an element adopted from education. This example also proves that workplace learning is being taken more seriously than before and is not inferior to educational learning (cf. Billett, 2004). Inspired by Schatzki (2001; 2002), Shove and colleagues (2012), developed a theory about practice dynamics, which claims that practices change due to changes in 'materials', 'competencies' and 'meanings'. Most importantly in this study, the newcomers are seen to bring new 'competencies' in the form of research skills and new 'meanings' in the form of integrity of application. They are eager to share formal, scientific information. The information culture in the workplace is key to how this newcomer approach is received. The new nurses specified different strategies to change the information culture, for example, searching for information together with colleagues or targeting the most responsive colleagues first. Newcomers take a proactive approach to information, which is negotiated within existing

practices and culture. The newcomers feel that their epistemic competencies are valued and that they can contribute to the practice and exchange information in a two way process.

Thus in this context it is clear that the training-nurses are not passively transitioned into the existing practices. The training nurses and the community of practice negotiate and exchange different types of information, which stimulate mutual learning in a dynamic practice and allows information sharing to be fluid and less hierarchical. The workplace is characterised by mutual information sharing and learning, even between the professions. The newcomers experienced that hierarchy is disappearing both within the nursing profession and in relation to other medical professions, like physicians. Physicians have traditionally exercised power over nurses and experienced nurses over new nurses. New members in a community are typically described as appropriating practices "in a culture of unequal power relations" (Gherardi, 2006, p. 97) and being legitimate peripheral participants, who learn and reproduce practice (Lave & Wenger, 1991). The training nurses in this study tell a different story. According to Johannisson and Sundin (2007), dealing with research information may change power relations. The present study supports this claim. In today's society, being able to identify and use the best and most up-to-date information may be considered a new form of 'capital' (cf. Bourdieu, 1977).

6.4 **Transformation of newcomers' information practices**

The last research question considers how newly qualified nurses' information experiences and approaches towards information transform from the last year of their education through the first two years in the workplace. This is the longitudinal part of the study and characterises the typical attitudes of the newcomers at each stage; from Bachelor's thesis writing throughout the three series of the interviews conducted.

In the last educational year, the study participants were conscious about EBP and were able to use a great variety of information sources to respond to a question. They demonstrated confidence in searching, appraising and using scientific information as well as expert and patient information. They were well trained to select relevant and up-to-date information of good quality. In the first series of discussions, the training nurses were concerned about being skilled professionals, demonstrating integrity and doing things right according to formal information sources. They attempted to promote up-to-date professional and scientific

information to their colleagues, but found the situation frustrating not having the confidence to speak out about potentially harmful situations. Although dealing with formal and even scientific information was encouraged in the hospital, they identified several co-existing practices on the wards. In the second series of discussions, they expressed their bridge-building role on the wards; attempting to implement and teach new procedures and share relevant information. Thus, in many situations, the training nurses took on the role of tutor. In the third series of discussions, they explained that they shared with and taught their colleagues what information resources to seek across the hospital. These were social and textual information sources they had been introduced to in the workplace training programme, as well as in the educational programme. They were now able to justify their decisions more easily, due to greater confidence and a clearly defined professional identity. The dominant attitude was 'Bring it on!', because they knew all the information resources in the hospital and had learnt to apply these in practice in the different wards they had worked on.

The EBP content of the nurse training education has enhanced the nurses' research skills (cf. Article 1). The new generation of nurses seem to be comfortable navigating the digital information landscape. They know where to find reliable information and how to use it, which has become a critical skill in health care. However, even though all the new nurses had the same educational training, the nurses not engaged in the support training programme, did not demonstrate the same confidence to oppose and substantiate information of their colleagues. Thus, participation in the workplace training programme seems to be the main difference between the two groups, but also they were chosen to the training programme, because they already were high-performing during their education. The training programme facilitates new employees' transition between education and the workplace and their confidence and ability to adapt to new information. The training nurses seem to generate information resilience, which is the capacity to adapt to changes and transform workplace practices (cf. Lloyd, 2013). Participation in the training programme is connected to boundary crossing and development of knowledgeability (cf. Wenger-Trayner and Wenger-Trayner, 2015); since the training nurses work on three different wards and additionally get to know several other services and resources in the hospital. The ability to seek expertise across the hospital was demonstrated by the training nurses' boundary crossing, enabling a further enhancement of their knowledgeability.

The training programme may influence the training nurses' information practices in several ways. Firstly, the training nurses know they have support in their community of training nurses.

This makes it easier to promote new information on the wards, to share information and experiences about situations and how to act in challenging circumstances. Time was allocated every month to share and reflect upon these experiences. Secondly, the training programme provided the newest information about tools, procedures and resources in the hospital. Experienced nurses had not been given the same information or training and were thus more reluctant to adopt what was new. Thirdly, the programme helped to connect different types of information: the training nurses were supposed to read procedures and other textual information to prepare for the monthly sessions. In the sessions, they were having conversation-based teaching and demonstrations with experts from the hospital. These experts referred to research and other textual sources. The support training also included simulation exercises intended to practice what they had read about and were taught. At the end of these simulation exercises trainee nurses were given time to reflect on and query actions with the experts.

The approach to learning in the training programme is an exemplary way of developing expertise according to Ericsson and colleagues (2007). They emphasise the significance of simulation training with immediate feedback. Some of the characteristics of nursing expertise framed by Hutchinson and colleagues (2016) may also be recognised: using a variety of information sources, critical reflection, teaching and influencing others and being a catalyst for change. However, there are characteristics the new nurses lack, such as rapid, intuitive decision-making and action. This underpins an important point; that novices may be considered experts in the context of being up-to-date (Fuller et al., 2005), while experienced members of a community are considered the tacit experts, possessing collective and shared ways of knowing in the community (as described by Gherardi, 2006). By mutual learning, the parties can thus complement each other. Complementary expertise is an important aspect in collaborative information behaviour (e.g. Reddy & Jansen, 2008). Benner (1984) claims that development of expertise implies moving away from reliance on theory and procedures to a tacit, intuitive understanding of situations. However, the findings in this study indicate that up-to-date and reliable theoretical information is an indispensable information source for both new and experienced nurses, as well as management, other health personnel and not the least patients (cf. Hult et al. (2016) about searching information together with the patient). The value of up-to-date and reliable document sources to supplement expertise seeking was also one of the findings in the review of Hertzum (2014). Healthcare is constantly developing with regard to new diagnostic tools and treatment methods. Hence, being up-to-date is key.

6.5 Limitations of the study

This thesis consists of two fundamentally different studies conducted in two different contexts. The common link is the participants, who first are exposed to a library teaching intervention in the educational context and then a workplace training programme. Information practices in these contexts are normally not comparable, however, in this thesis it is argued that EBP is a common ground to information in both contexts and teaching and information practices related to EBP are diffusing across the contexts. In this regard, it is relevant to explore how information practices travel between contexts. In general, the study in the educational context provides a relatively limited view of information practices and culture in nurse education, because only the product of Bachelor's thesis writing is explored. The teaching intervention in this specific nursing education is unique. It is instilled in these nursing students over the course of three years that research information is essential to nursing practice. They are given extensive training in research skills throughout their nursing education. Nursing students in other nurse education programmes thus not have the same attitudes, motivation and skills regarding information. The findings in the educational study may thus not be generalisable.

In the workplace study, the participants are specially selected to join a workplace training programme, which is an elite initiative. The selection process and participation is likely to affect both their self-esteem and how they are regarded by others, which probably influence their proactiveness to information practices. Information practices of new nurses not participating in the programme were compared to those of the training nurses, but an imbalance in the number of participants of the two groups of nurses makes it difficult to compare the groups. Additionally, the workplace training programme offers two years with lectures and simulation training, which is more than other transition programmes. Thus, both interventions are at the forefront of the development of nurse training and practice.

Additionally, information practices and culture differs between the wards and over time. This study provides a relatively limited view of information practices and culture in one organisation. Only one aspect of information culture is examined: that of approaches to information use. These approaches are experienced by new nurses on a few different wards in only one hospital. Even if the interview material about new nurses' experiences is supplemented

by observations, these were mainly made within the training programme and not during the daily practice on different wards, and other perspectives are missing.

Another specificity point is that these studies are conducted in a country with relatively equal relations within and between medical professional groups. Newcomers' influence on information practices and culture would possibly not happen so easily in cultures with strong hierarchies.

7 Conclusion

This thesis explores how nurses experience information and approach information practices and information culture, during the last months of their nursing education and through their first two years in the workplace. The interaction between newcomers, information practices and culture is a central focus of the thesis. Information practices and culture in education were investigated in the context of the requirements and practices for writing the Bachelor's thesis. Observation and focus group discussions in a hospital training programme provided insight into the workplace information practices and culture. Together, the three articles in the thesis consider the ways in which information practices and culture mutually influence the transition from being nursing students to competent nurses. General findings show that a great variety of information sources is used in education as well as in the workplace. This is consistent with EBP thinking, which seems to have a persistent influence on the participants' approaches to information over the three years of the study. The known practice/theory divide between education and workplace has become increasingly blurred as teaching practices have been diffused across the contexts. In this case studied, this was especially due to a supportive workplace training programme. Such programmes are seen to facilitate and support new employees' transition towards information resilience at work. In this study, this enabled mutual learning in dynamic work practices, since the novices exchanged up-to-date information and ways of finding reliable information with colleagues' tacit and collective ways of knowing.

The thesis has a number of potential contributions. Firstly, during decades of research on workplace information behaviour, the focus on information systems and sources has moved towards a focus on individual information users and most recently towards practices and information within social interactions. This thesis maintains the latest focus; however, at the same time it acknowledges the individuals' values, skills and motivations. A mutual relationship between individuals and communities is emphasised. Secondly, the thesis provides an insight into how information practices may travel over time and place. There are few longitudinal studies of information practices and it is even rarer that the same people's information practices are being considered in two different contexts. Thirdly, there seems to be a shift in healthcare to use a greater variety of information sources influenced by EBP. Different occupations and communities are collaborating to create common procedures and guidelines, and even the patients are searching for information themselves and discussing issues together

with the professionals. The thesis indicates that this contributes to a change in the traditional hierarchies between the parties. The professionals operate more frequently on the interface of different communities in the practice landscape. This emphasises the flexible edge of information practices, traditionally considered as relatively standard and stable.

Some precautions have to be taken about generalising from the specific contexts studied in this thesis. The study is conducted in a country with relatively equal relations within and between medical professional groups, and with regard to the relationship between patients and health personnel. The country is also at the forefront in implementing EBP both in health education and in hospitals. In the actual nurse education, teaching research skills is a high priority. Additionally, the hospital training programme provides two years of lectures and simulation training, which is more than other transition programmes. The participants in the programme are specially selected, based on being highly skilled. The findings can thus not be generalised, however, practices are diffusing when such initiatives prove to be successful. These findings may be significant to society at different levels: 1) What considerations should be taken into account when teaching EBP and information literacy in education?, and 2) What is the significance of workplace training programmes to workplace information practices and organisational development?

To conclude, a practice approach where individuals and social structures are both given equal attention seems as a fruitful way of deepening our understanding of how and why information are used in everyday work. This work, except for providing the contributions mentioned above, also opens towards new research questions concerning professional information practices, in general and in particular within nursing: How do nurses' experiences and attitudes develop in even longer time perspective?; What eventual drawbacks have (too) slowly or (too) quickly developing practices?; and, what happens when new contributors, for instance patients, are interfering with/ are included into the nursing practice? These and other questions remain to be answered in the future.

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Appendix 1: Approval personal data processing

Norsk samfunnsvitenskapelig datatjeneste AS
NORWEGIAN SOCIAL SCIENCE DATA SERVICES

Harald Hårfagres gate 29
N-5007 Bergen
Norway
Tel: +47-55 58 21 17
Fax: +47-55 58 96 50
nsd@nsd.uib.no
www.nsd.uib.no
Org.nr. 985 321 884

Anita Nordsteien
Institutt for arkiv, bibliotek- og informasjonsfag Høgskolen i Oslo og Akershus
Pilestredet 48
0167 OSLO

Vår dato: 30.06.2014 Vår ref: 39107 / 3 / SSA Deres dato: Deres ref:

TILBAKEMELDING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 24.06.2014. Meldingen gjelder prosjektet:

39107	*Sykepleieres interaksjon med informasjon i nyansattprogrammer i et sykehus*
Behandlingsansvarlig	*Høgskolen i Oslo og Akershus, ved institusjonens øverste leder*
Daglig ansvarlig	*Anita Nordsteien*

Personvernombudet har vurdert prosjektet og finner at behandlingen av personopplysninger er meldepliktig i henhold til personopplysningsloven § 31. Behandlingen tilfredsstiller kravene i personopplysningsloven.

Personvernombudets vurdering forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, ombudets kommentarer samt personopplysningsloven og helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema, http://www.nsd.uib.no/personvern/meldeplikt/skjema.html. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, http://pvo.nsd.no/prosjekt.

Personvernombudet vil ved prosjektets avslutning, 01.08.2017, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen

Katrine Utaaker Segadal

Sondre S. Arnesen

Kontaktperson: Sondre S. Arnesen tlf: 55 58 33 48
Vedlegg: Prosjektvurdering

Dokumentet er elektronisk produsert og godkjent ved NSDs rutiner for elektronisk godkjenning.

Avdelingskontorer / *District Offices*:
OSLO: NSD. Universitetet i Oslo, Postboks 1055 Blindern, 0316 Oslo. Tel: +47-22 85 52 11. nsd@uio.no
TRONDHEIM: NSD. Norges teknisk-naturvitenskapelige universitet, 7491 Trondheim. Tel: +47-73 59 19 07. kyrre.svarva@svt.ntnu.no
TROMSØ: NSD. SVF, Universitetet i Tromsø, 9037 Tromsø. Tel: +47-77 64 43 36. nsdmaa@sv.uit.no

Personvernombudet for forskning

Prosjektvurdering - Kommentar

Prosjektnr: 39107

Utvalget informeres skriftlig om prosjektet og samtykker til deltakelse. Informasjonsskrivet er godt utformet.

Personvernombudet legger til grunn at forsker etterfølger Høgskolen i Oslo og Akershus sine interne rutiner for datasikkerhet. Dersom personopplysninger skal sendes elektronisk eller lagres på mobile enheter, bør opplysningene krypteres tilstrekkelig.

Forventet prosjektslutt er 01.08.2017. Ifølge prosjektmeldingen skal innsamlede opplysninger da anonymiseres. Anonymisering innebærer å bearbeide datamaterialet slik at ingen enkeltpersoner kan gjenkjennes. Det gjøres ved å:
- slette direkte personopplysninger (som navn/koblingsnøkkel)
- slette/omskrive indirekte personopplysninger (identifiserende sammenstilling av bakgrunnsopplysninger som f.eks. bosted/arbeidssted, alder og kjønn)
- slette lydopptak

Appendix 2: Information letter Bachelor's thesis

SAMMENLIGNENDE STUDIE AV BACHELOROPPGAVER

Hei alle sykepleierstudenter

Undertegnede planlegger å gjøre en sammenlignende studie av bacheloroppgaver knyttet til kunnskapshåndtering.

Kull 2010 og 2011 har ikke hatt en systematisk undervisning i kunnskapshåndtering gjennom hele studieprogrammet. Studieåret 2012/2013 ble en ny undervisningsmodell i kunnskapshåndtering innført i bachelorprogrammet i sykepleie. Kull 2012 vil gjennom hele studieprogrammet ha en systematikk knyttet til dette temaet.

Hensikten med denne studien er derfor å sammenligne bacheloroppgaver til kull 2010, 2011 og 2012, for å finne ut hvilken effekt undervisningsmodellen har hatt på studentenes læring i kunnskapshåndtering.

Det er gitt tillatelse av instituttleder til å forspørre deg. For å sikre at din signatur ikke legges sammen med bacheloroppgaven, må skjemaet legges i en egen eske på Høgskoletorget. Vi forsikrer at datamaterialet vil behandles konfidensielt.

Vi setter stor pris på ditt samtykke.
Takk for hjelpen og lykke til i fremtidig virke som sykepleier!

Med vennlig hilsen

Anita Nordsteien
Universitetsbibliotekar

May-Elin T. Horntvedt
Høgskolelektor

Jeg har forstått informasjonen angående denne studien og samtykker til at min /vår bacheloroppgave kan anvendes

…………………………………….
dato

Student: ……………………………………………….

Appendix 3: Information letter hospital management

Forespørsel om deltakelse i forskningsprosjektet

Sykepleieres interaksjon med informasjon i et nyansattprogram i et sykehus

Bakgrunn og formål
Forskningsprosjektet er en doktorgradsstudie ved Bibliotek- og informasjonsvitenskap ved Høgskolen i Oslo og Akershus. Formålet med prosjektet er å undersøke nyansatte sykepleieres møte med en ny arbeidsplass. Hovedfokuset er å se på hvordan nyansattes interaksjon med ulike typer informasjon bidrar til å håndtere arbeidsoppgavene i et sykehus, og kartlegge hvordan nyansatte sykepleiere dekker sine informasjonsbehov. Datamaterialet som innsamles vil også bli brukt i evalueringen av opplæringsprogrammet for nyansatte sykepleiere i samråd med sykehuset. Forskningsprosjektet forutsetter først og fremst sykehusets skriftlige samtykke. Under forutsetning av dette, vil et utvalg sykepleiere ansatt fra høsten 2014 få forespørsel om å delta, med informasjon om at all deltakelse i dette forskningsprosjektet er frivillig og krever deres skriftlige samtykke.

Hva innebærer deltakelse i studien?
Studien vil kreve min tilstedeværelse i de aktiviteter opplæringsprogrammet legger opp til. De som samtykker til deltakelse i studien vil kunne bli observert under simuleringsøvelser, casestudier, veiledningsgrupper og lignende aktiviteter på de avsatte fagdagene. Etter nærmere avtale vil noen av disse aktivitetene bli tatt opp med diktafon. Det er også ønskelig å foreta gruppeintervju ved oppstart, midtveis og mot slutten av opplæringsprogrammet. Spørsmålene vil hovedsakelig omhandle deltakernes interaksjon med informasjon, men også forventninger og etter hvert erfaringer i forhold til opplæringsprogrammet, kompetanseutvikling og overføringsverdi av kunnskap ervervet i utdanningen. Intervjuene vil bli tatt opp på lydbånd. Det er også ønskelig å få tilgang til utdelt informasjon til deltakerne, og innsyn i e-læringskurs o.l. Jeg vil ikke følge deltakerne i klinisk arbeid, så for å få innblikk i informasjonshverdagen ved de ulike avdelingene, vil deltakerne kunne bli spurt om å loggføre definerte aktiviteter i sitt kliniske arbeid over en kortere periode. Det er også aktuelt å gjøre intervju med enkelte veiledere og avdelingsledere. For evalueringsformål er det ønskelig å gjøre intervju med en gruppe nyansatte sykepleiere som ikke deltar i opplæringsprogrammet.

Hva skjer med informasjonen om deltakerne?
Alle personopplysninger vil bli behandlet konfidensielt i tråd med forskningsetiske retningslinjer. Navneliste med kontaktopplysninger til deltakerne vil bli oppbevart i låst skuff på mitt kontor separat fra datamaterialet, og kun jeg vil ha tilgang til personopplysningene. Lydfiler og andre innsamlede data vil være anonymisert og bli lagret på eget passordbeskyttet område på PC på min arbeidsplass, og vil ikke kunne knyttes til navnelisten. Min veileder og eksaminatorer vil imidlertid kunne få tilgang til datamaterialet på forespørsel. Datamaterialet vil bli publisert på en slik måte at det ikke er mulig å kjenne igjen enkeltpersoner. Personopplysninger og lydopptak vil slettes når studien avsluttes, etter planen høsten 2017. Datamaterialet vil bli brukt både i faglige publikasjoner, presentasjoner og i evalueringsarbeid.

Studien er i tråd med forskningsetiske retningslinjer meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste AS.

Ved ytterligere spørsmål om studien, ta kontakt med Anita Nordsteien, tlf. 48042372, eller på mailadressen anita.nordsteien@gmail.com. Samtykket kan skannes og sendes på denne mailadressen.

Appendix 4: Information letter participants

Forespørsel om deltakelse i forskningsprosjekt

Bakgrunn og formål

Dette forskningsprosjektet er en doktorgradsstudie ved Bibliotek- og informasjonsvitenskap ved Høgskolen i Oslo og Akershus, og gjennomføres i tett samarbeid med sykehuset. Formålet med prosjektet er å undersøke nyansatte sykepleieres møte med en ny arbeidsplass. Hovedfokuset er å se på hvordan nyansattes interaksjon med ulike typer informasjon bidrar til å håndtere arbeidsoppgavene i et sykehus, og kartlegge hvordan nyansatte sykepleiere dekker sine informasjonsbehov. Datamaterialet som innsamles vil også kunne bli brukt i evalueringen av opplæringsprogrammet for nyansatte sykepleiere. Alle sykepleiere ansatt fra høsten 2014 vil få forespørsel om å delta, det presiseres at all deltakelse i dette forskningsprosjektet er frivillig og krever deres skriftlige samtykke.

Hva innebærer deltakelse i studien?

Sykehuset har godkjent min tilstedeværelse i de aktiviteter opplæringsprogrammet legger opp til. De som samtykker til deltakelse i studien vil kunne bli observert under simuleringsøvelser, casestudier, veiledningsgrupper og lignende aktiviteter på de avsatte fagdagene (ca. en gang per mnd.). Etter nærmere avtale vil noen av disse aktivitetene bli tatt opp med diktafon. Det er også ønskelig å foreta gruppeintervju ved oppstart, midtveis og mot slutten av opplæringsprogrammet. Spørsmålene vil hovedsakelig omhandle deltakernes interaksjon med informasjon, men også forventninger og etter hvert erfaringer i forhold til opplæringsprogrammet, kompetanseutvikling og overføringsverdi av kunnskap ervervet i utdanningen. Intervjuene vil bli tatt opp på lydbånd.

Hva skjer med informasjonen om deg?

Alle personopplysninger vil bli behandlet konfidensielt i tråd med forskningsetiske retningslinjer. Navneliste med kontaktopplysninger til dere informanter vil bli oppbevart i låst skuff på mitt kontor separat fra datamaterialet, og kun jeg vil ha tilgang til personopplysningene. Lydfiler og andre innsamlede data vil være anonymisert og bli lagret på eget passordbeskyttet område på PC på min arbeidsplass, og vil ikke kunne knyttes til navnelisten. Min veileder og eksaminatorer vil imidlertid kunne få tilgang til datamaterialet

på forespørsel. Datamaterialet vil bli publisert på en slik måte at det ikke er mulig å kjenne igjen enkeltpersoner.

Personopplysninger og lydopptak vil slettes når studien avsluttes, etter planen høsten 2017. Datamaterialet vil bli brukt både i faglige publikasjoner, presentasjoner og i evalueringsarbeid.

Frivillig deltakelse

Det er frivillig å delta i studien, og du kan når som helst trekke ditt samtykke uten å oppgi noen grunn. Dersom du trekker deg, vil alle opplysninger om deg bli anonymisert.

Dersom du ønsker å delta, kan du levere skjemaet tilbake første arbeidsdag. Har du spørsmål til studien, ta kontakt med Anita Nordsteien, tlf. 48042372, eller på mailadressen anita.nordsteien@gmail.com

Studien er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste AS.

Samtykke til deltakelse i studien

Jeg har mottatt informasjon om studien, og er villig til å delta

----

(Dato og signatur fra prosjektdeltaker)

Appendix 5: Focus group interview guide

1st series:

- Why did you choose to be nurses?
- What knowledge and skills do you think will be important in your practice?
- People talk about a theory – practice gap and a practice shock. What thoughts and experiences do you have regards to that?
- What knowledge and skills do you need to acquire on your ward to do a good job as fast as possible?
- What preparations have you done so far to be ready to practice nursing, and what strategies do you plan to use?

2nd series:

- What preparations did you do for the second ward?
- What differences did you experience between the first and the second ward?
- What knowledge has been most useful so far and how did you acquire that knowledge? (Information sources etc.)
- Did you experience any inconsistencies between the different information sources (colleagues, procedures, previous knowledge)? (Elaborating on findings from the 1st series)
- What knowledge, experiences or practices have you tried to promote to your colleagues and how was it received? (Elaborating on findings from the 1st series)
- In what situations do you feel inexperienced and uncertain, and in what situations more confident?
- How do you feel that you have changed as nurses during this first year, what is different at the workplace now compared to one year ago?

3rd series:

- In the previous interviews, we talked about the culture on the various wards regards to structure, management, cooperation and ways of communicating, support from

colleagues and other professions. How is the culture on the ward affecting learning and your ability to use your skills and knowledge?

- How do you think you have affected the various wards you worked on? What were your contributions, what beliefs, knowledge and skills did you promote to these wards?
- What do you want to bring to the ward you are going to work on in your future position, and how do you think you will influence the practices on this ward?
- In which ways do you feel that you have changed during these two years in the training programme, working on three different wards?
- Cf. Benner's competency levels (giving some information about that). What do you think about the model, do you recognise these stages in your development as a nurse? What do you think about your competency at this stage?
- How would you describe how the training programme and being a group going through the programme together has affected you confidence and your contributions to the hospital ward.

Appendix 6: Codebook

Code name	Description of codes
Actors	Group of people to whom reference is made
Experienced nurse	References to experienced nurses as role models or the opposite
Physicians	References to physicians on ward
Event	Things that happen at a point in time
Changing ward	Responses due to changing ward two times in programme
Information need	Need for information to handle work activities
Information strategies	Purposeful activity to achieve a goal or deal with an issue
Bodily information	Learning by using senses (observation, doing things)
Epistemic (procedures)	Reading the instructions in the hospital information system when doing things
Epistemic (theory and research)	Reading textbooks, guidelines, research etc. when doing things, theoretical information
Social information	Asking colleagues to find out how to do things
Organisational culture	Behaviour at the workplace/ on ward, trustworthiness of people and system
Interprofessional relations	Cooperation and communication between different persons on ward
Management	Managers/ leaders of wards, hospital
Sanctions	Being told that you should do differently, being punished for doing things
Support	Getting help and advice from colleagues
Trust	Trust or distrust of people or information
Outcome	What facilitates or hinders learning and developments of practices
Barriers for learning	What are hinders for learning
Challenging	Dissatisfaction of way of doing things by questioning, substantiating, opposing
Complying	Actors want/have to align with the practices on a ward
Facilitators for learning	What facilitates learning
Transition of practices	Influence is exercised by actors on practices on a ward

Personal qualities	Descriptors of the person
Ability to change	The actors are flexible/ compliant and are able to deal with new routines, wards and colleagues
Identity	Sense of self, who a person is, the qualities and beliefs that identifies a person
Integrity	Adherence to ethical principles and doing things the right way
Motivation of learning	Joining activities because of the opportunity of acquiring knowledge and skills
Stages of development	Development of competency and identity, individual state due to transition challenges
Acting automatically	Tasks are handled more automatic than before because of experience
Confidence	A sense of control, knowing what to do and how
Negative feelings	Not feeling competent: insecurity, anxiety, disappointment, disillusion, worries
Transition from education	What knowledge do nurses bring from their education

Appendix 7: Coding matrix

Code / Data	Trust	Challenging	Complying
Training-nurses Focus group 1 First year	Asking several colleagues to be sure, because of the feeling of getting wrong answer. The procedures are the safest information	Wanting to find their own identity, to be a skilled professional. Won't listen to colleagues who take short cuts, should do things right according to procedure and maintain good habits. You are responsible to acquire the knowledge you need.	You are adapting quickly to the routines. It is not always possible due to time and resources to do things according to theory, but it is possible to adapt and do it properly anyway
Training-nurses Focus group 2 First year	Experiences of mistakes being done, but have to be careful of how to confront colleagues.	Can observe how colleagues do things and decide not doing it that way yourself. Have to feel on your own how you want to practice. When something is done wrong, they ask why colleagues do as they do, but important how to question to avoid sanctions.	Have to do the best out of situations, have to find creative solutions when a situation is not ideal. Some nurses are very good, they know what's working due to their experience and having the research knowledge about it.
Training-nurses Focus group 3 First year	"You may get five different answers when asking a question to colleagues. Some experienced nurses tell us to read the procedure, because they may give wrong answer. Some nurses do it differently; they claim that the procedure is wrong, which is confusing".	Strategies of questioning, some colleagues get annoyed. Important to report errors and tighten procedures. Notify the superiors. Should try to initiate a culture where it's okay to speak out, I want to be up-to-date and the best nurse. Teaching and promoting new knowledge. Asking "why".	Complying to the procedures when getting different answers. Having some very good role models who refers to procedures and research all the time. Feel that colleagues are more up-dated than before, wanting to share information.

Non-training-nurses Interview 1 First year	"I ask my colleagues a lot because I think they are knowledgeable and experienced, and I do not have time to check myself. It is faster to ask someone".	Questioning when inconsistency between knowledge from school and practice, but it is not always appreciated. Don't want to confront.	"We are new, and it is not easy to confront the colleagues, we have to do what we are told. I have to adjust to the procedures here".
Non-training-nurses Interview 2 First year	Asking a lot, it takes too long time to locate written information/ procedures, but one of the nurses was checking later at home wanting to learn more. There is no time to read procedures.	Has found easier ways of doing more practical things when it's no right or wrong. The nurses on one of the wards use to discuss a lot what harm patients less due to disinfection practices.	Adapting quickly to practice, doing like experienced nurses, even if learning something different at school (i.e. use of gloves)
Non-training-nurses Interview 3 First year	Noticing that colleagues do things differently, and questions the practice, but accepts the explanation. Trusting their colleagues. Reading at home.	Important to question, but have not experienced any situations they did not agree on after getting an explanation.	Feeling that theory and practice are two quite different things, and that they experience the practice as justifiable.
Training-nurses Focus group 4 Second year	Mistakes are done because of not doing proper documentation, do not know whether thing are done or not because of missing records.	I want to promote the best things from the different wards to my permanent ward and tell what is working. About being more experienced: You find your role and your identity gets stronger. You have to consider whom you make suggestions to.	Missing structure at the previous ward, but some nurses are adjusting very quickly. It's very difficult to be the person not organising the work like the others do.

Training-nurses Focus group 5 Second year	Very good culture of sharing information, but experienced nurses are often not updated, mistakes are done, they say something different than the procedures, they can not be trusted 100% as procedures often change: “we always have to double check the procedures”.	Confronting colleagues about not using a new tool: «I am anyway going to (…) make them use it”. “There is considerable negativity regards new procedures. We have to promote it in a positive way, and make them understand that it isn’t really a big change, and that we should do it to prevent any harm to our patients”.	Have to adjust to new routines when changing ward, difficulties to change ward and to adjust to a different culture and ways of working and communicating. Frustrations before getting used to it, but do not challenge these things
Non-training-nurses Interview 4 Second year	“Experienced nurses know a lot, but may not be the safest information source when procedures changes. I know whom I should ask. It is not time to look up procedures; we have to trust experienced nurses”.	We all do things differently; I guess my experienced colleagues think it is very difficult to change anything. When I experience that nurse assistants don’t listen to me when I try to delegate tasks, I often have to do things myself.	Observing and wanting to be like the experienced nurses in critical situations. Changing way of doing things according to the procedures The nurses do as they are told, but physicians care less about doing things new ways.

Article 1

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Use of research in undergraduate nursing students' theses: A mixed methods study

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ABSTRACT

Background: Health care personnel are expected to be familiar with evidence-based practice (EBP). Asking clinical questions, conducting systematic literature searches and conducting critical appraisal of research findings have been some of the barriers to EBP. To improve undergraduate nurses' research skills, a collaborative library-faculty teaching intervention was established in 2012.
Objectives: The aim of this study was to evaluate how the collaborative library-faculty teaching intervention affected the nursing students' research skills when writing their final theses.
Design and Setting: Both quantitative and qualitative data collection and analysis were used. The study focused on a final year undergraduate nurse training programme in Norway.
Participants: 194 theses submitted between 2013 and 2015 were collected and assessed. The students were exposed to the intervention for respectively one, two and three years during this period.
Methods: Descriptive statistics were used to compare each year's output over the three-year period and to examine the frequency of the use of various databases, types of information and EBP-tools. Qualitative data was used to capture the students' reasoning behind their selection processes in their research.
Results: The research skills with regard to EBP have clearly improved over the three years. There was an increase in employing most EBP-tools and the justifications were connected to important EBP principles. The grades in the upper half of the grading scale increased from 66.7 to 82.1% over the period 2013 to 2015, and a correlation was found between grades and critical appraisal skills.
Conclusions: The collaborative library-faculty teaching intervention employed has been successful in the promotion of nursing student research skills as far as the EBP principles are concerned. Writing a thesis in the undergraduate nursing programme is important to develop and practice these research skills.

1. Introduction

This paper sets out to evaluate the outcomes of a collaborative library-faculty teaching intervention for research application as a part of evidence-based practice (EBP) in an undergraduate nurse training programme in Norway. EBP involves clinical decisions, which are founded on the best scientific evidence and clinical expertise alongside patients' preferences in a specific context (Straus et al., 2011). This implies that health care personnel have to be familiar with asking clinical questions, conducting systematic literature searches and conducting critical appraisal of the research findings, which have been some of the barriers to implementation of EBP (Straus et al., 2011). Research use is an essential aspect of EBP in health care, and therefore these skills need to be acquired in undergraduate health education.

Nursing education in Norway involves a three-year programme, including writing a thesis in the final term. This provides an opportunity to attain the research skills that are required in future professional practice. The thesis in Norway is afforded 15 ECTS (European Credit Transfer and Accumulation System), which in this specific programme is allotted 10 weeks full-time work and a written documentation of about 9000 words for an individual thesis and about 11,000 words for a joint thesis. The thesis is required to take the form of an extended literature review focusing on a nursing-related theme. It includes: 1) an introduction culminating in a precise research question, 2) a methods section describing the literature search by search terms and relevant databases; at least four peer reviewed journal articles have to be presented and critically appraised, 3) a theory section presenting relevant literature like government documents, guidelines, legislation and the like, 4) a discussion of the research question based on the selected literature, 5) a conclusion and 6) an accurate citation and reference list in

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APA style. Additionally, since 2014 the search strategy and a PICO framework is required when submitting the thesis. PICO is a categorisation of search terms into population, intervention, comparison and outcome. Beyond these criteria, EBP is not mentioned.

The requirement for research application in nursing is anchored in the International Ethical Guidelines for nurses and educational frameworks. The ICN Code of Ethics emphasises that nurses must determine and implement research-based standards in their clinical practice and should be "active in developing a core of research-based professional knowledge that supports evidence-based practice" (2012, p. 3). The Norwegian Qualifications Framework in Higher Education is based on the Bologna process, European Higher Education Area. Even this framework specifies expected learning outcomes for candidates with a Bachelor degree, which includes skills in finding, evaluating, referring and applying scholarly information (Ministry of Education and Research, 2012, pp. 7–8).

A number of studies have found that it is challenging to teach research skills to undergraduate nursing students (e.g. Duncan and Holtslander, 2012; Jacobsen and Andenæs, 2011; Ragneskog and Gerdner, 2006), and collaboration between faculty and library staff is essential to succeed (Bønløkke et al., 2015; Cader et al., 2006; Gannon-Leary et al., 2003; Nayda and Rankin, 2008). The library staff has to engage in the domain of nursing to fully understand and accommodate the specific information needs of nursing students (Sundin et al., 2008). The teaching content and the learning goals should be consistent. It is not enough to teach how to search for information; skills such as formulating a research question and critically appraising, analysing and synthesising the literature are also required. This requires boundary crossing and mutual learning between faculty and library staff (Limberg and Folkesson, 2006).

Moreover, it is recommended that teaching research skills should be systematically integrated into the nursing curriculum and closely related to course assignments (Barnard et al., 2005; Duncan and Holtslander, 2012; Klem and Weiss, 2005). Several empirical research studies have explored a written thesis as a potential strategy for improving these skills (Friberg and Dahlborg-Lyckhage, 2013; Kapborg and Berterö, 2002; Lundgren and Halvarsson, 2009; Lundgren et al., 2008; Lundgren and Robertsson, 2013; Mattila et al., 2005). However, these strategies have mainly been evaluated by questionnaires concerning the students' experiences, satisfaction and self-evaluation of skills, and not the process and product of the student thesis as a work assignment.

The aim of this study is to evaluate how a collaborative library-faculty teaching intervention affects the nursing students' research skills when writing their theses.

The research question focused upon is: How do the research skills of undergraduate nursing students evolve as a result of a collaborative library-faculty teaching intervention? This is assessed by examining theses submitted over the three-year implementation period, 2013–2015.

2. Methods

This study uses mixed research methods. A quantitative data collection and analysis is supported by qualitative data to acquire a broader and deeper understanding of the outcomes of the teaching intervention applied (Johnson et al., 2007).

2.1. Teaching Intervention

A new library-faculty teaching intervention was implemented to improve nursing students' research skills related to EBP in 2012, more thoroughly described in Nordsteien et al. (2013). The teaching intervention included the first four steps of the main EBP model: 1) cultivate a spirit of inquiry, 2) ask clinical questions in a PICO format, 3) search for the best evidence and 4) critically appraise the evidence (Melnyk et al., 2010). Additionally, the S-Pyramid was promoted, which is organising information sources into six levels to facilitate easy access to high quality research (Dicenso et al., 2009). A number of different small seminar groups were used for teaching, focusing, for example, on demonstrations of databases and practical exercises on computers; always linked directly to study assignments with relevant clinical application. A close collaboration between librarians and nurse educators was established to be able to teach the EBP-model effectively throughout all three years of the study programme. Representatives from both professions were involved in planning the course content together, attending the same classes and workshops, and sometimes, alternating teaching and giving feedback to the students. The librarians taught mainly steps 2 and 3 of the EBP-model, while the nurse educators focused on the other steps. However, there were no strict boundaries, since both members of teaching staff participated in each other's sessions. The students who graduated in 2013, were exposed to the new teaching intervention only during their final year, while the students who graduated in 2014 and 2015 were respectively exposed to the intervention for two and three years of their programme.

2.2. Sample

In total 194 electronic versions of Bachelor's theses were collected and assessed. 42 of these were from students who graduated in 2013, 74 from students who graduated in 2014 and 78 from students who graduated in 2015. This accounted for 76%, 94% and 98% of the total number of theses submitted of each respective year. Some of the students in each year chose not to participate. The increased number of participants between 2013 and 2014 may be due to increased knowledge among the students about the teaching intervention and this evaluation. Moreover, the regular teaching and a tighter relation between the 2014 and 2015 students and the librarians may have motivated more students to participate. The number of individual submitted theses increased from 64% in 2013 to 76 in 2014 and 77% in 2015.

2.3. Quantitative Method

The main intention of the study was to measure the effect of the teaching intervention by examining possible changes in the use of information sources, types of literature and EBP-tools across the three years. A coding scheme was developed following an initial cursory reading of a number of theses to get an understanding of what kinds of resources were being used. All databases, EBP-tools and information types, such as reviews, guidelines, point-of-care tools and legislation, were listed as variables. These variables were given the values 1 for yes and 0 for no. Additionally, variables regarding grading, the total number of databases employed and research articles were included in the scoring. Descriptions were made in the code scheme to guide coding.

The theses were divided between the two first authors of this paper for coding. Each author coded half of the theses submitted in each of the three years. The theses were given a reference number together with the graduation year. The theses were coded based on a read through of the methods sections, reference lists, PICO and search strategies. Values were assigned for each variable on a separate sheet for every thesis. The search function in Word was also used to double-check that everything was included. In cases of uncertainty, follow-up questions were noted on the thesis sheet. After coding, the authors exchanged every tenth thesis, in total 19 theses, to check for intercoder reliability, which proved to be 0.84. Three cases of disagreement related to categorisation of articles were resolved, and all the 194 code sheets were readjusted according to these agreements to improve the consistency of coding. The coding sheets were entered into SPSS version 24.0 and double-checked for possible errors.

2.4. Qualitative Method

The supplementary qualitative data aimed to capture the students' rationale for selection and use of various databases, information types and tools within EBP. Having data source of approximately 6000 text pages, random sampling was applied to conduct qualitative analysis. 25% of the theses from each submission year were randomly selected. The qualitative data was acquired by digitally marking text containing explicative rationale while doing the quantitative coding of the theses. These 49 theses were imported into NVivo11, and a second reading was conducted, and the rationales were coded into the three main categories of interest (cf. Bazeley and Jackson, 2013). This generated a collection of different rationales for the information seeking related choices that provided illustrative examples of student's ways of reasoning upon information seeking for their thesis work.

2.5. Ethical Considerations

Approval for this study was granted by the head of the Department of Nursing Science. The students were informed about the study prior to starting to write their thesis. They were informed that participation was voluntary, and that they could withdraw their consent at any time without any consequences. Anonymity was ensured, since the theses only contained a candidate number. Written consents were obtained from the participating students by the exam office when they submitted their thesis.

3. Results

194 theses were analysed to better understand how undergraduate nursing students apply research after having attended teaching focusing on EBP. Descriptive statistics were used to examine the frequency of the use of various databases, types of information and EBP-tools. Qualitative data was used to capture the students' reasoning behind their selections.

The quantitative data will mainly be presented under the respective subheadings below, however, in certain contexts, qualitative and quantitative data will be mixed to substantiate each other.

3.1. Selection of Databases and Search Engines

Table 1 shows the most frequently selected databases and search engines used to find research studies for these theses. The students were instructed to use several databases to locate literature, due to the different content of the databases. PubMed/ Medline and Cinahl were most extensively employed, since they are the largest medical databases, and therefore promoted in library classes throughout the nurse training programme. McMasterPLUS is a frequently used EBP tool based on the S-Pyramid. This search engine was also being recommended throughout the three years, while the other databases were promoted to a lesser degree.

Chart 1 illustrates the number of resources that were used in each thesis. The majority searched for research in three to five resources. There was no statistical significance between the submission year and the number of selected search engines or databases (significance level $p < 0.05$ in chi-square tests).

Table 1
Selected databases and search engines (N = 194).

Databases/search engines	Frequency	Percentage
PubMed or Medline	186	96
Cinahl	155	80
McMasterPLUS	131	68
Library catalogue	94	48
SveMed +	82	42
Cochrane	62	32
Ovid Nursing	48	25
PsycInfo	17	9
Google or Google Scholar	11	6

Several of the students justified their selection of databases and search engines by their familiarity and easiness:

> "The databases I employed are databases I got to know through my programme. I think they are easy to search and comprehensible".

Few students reported the use of Google/Google scholar. The students were told that they have to search systematically in relevant medical databases and cannot rely on Google alone, but that Google may be used as a supplement. Google and other search engines like YouTube were in these cases used to find information about the subject and experts in the field as illustrated in the cases below:

> "I have found an important researcher on delirium through my database search. She is one of the pioneers within the Confusion Assessment Method, thus, I have used both Google Scholar and Google to find more research that she has done".

> "We also searched YouTube to find lectures about ADHD. That led us to the name of an expert in this research field".

3.2. Selection of Information Types

Table 2 summarises what types of information the theses were based on. According to the table, ethical guidelines for nurses and relevant legislation were used in nearly all theses. Reviews, research syntheses, guidelines, point-of-care tools and official government documents were frequently used.

The only criterion given regarding information types was the inclusion of at least four research articles. Chart 2 illustrates how many research articles each thesis included cross the three years. The most frequent number was four in 2014 and 2015, the minimum requirement. However, in 2013 the most frequent number was eight to ten research articles, and a large proportion even included eleven or more.

The total number of selected articles declined steadily from 2013 to 2015.

3.3. Use of EBP Tools

EBP-related tools mainly included the use of the S-Pyramid and its resources on higher levels (point-of-care tools, guidelines and Cochrane reviews) and critical appraisal checklists. Table 3 shows how the use of different EBP-related tools changed in theses submitted in 2013, 2014 and 2015. There was a significant increase in the use of McMasterPLUS and point-of-care tools from 2013 to 2014. Justification for the selection of information types by reference to the S-Pyramid increased clearly over the three years, and the use of checklists for critical appraisal improved slightly over the same period. Cochrane library searches increased significantly from 2014 to 2015. However, the use of guidelines decreased slightly over the three-year period.

A requirement for the thesis was to critically appraise research articles used. Some of the students reported appraising the research by basic characteristics such as peer reviews, publication year, journal, authors, IMRAD structure, ethical considerations, relevance etc.

There was a slight increase of use of checklists over the three years. The use of checklists as a tool was justified in the following way:

> "Original research studies from Medline, PubMed and Cinahl require a close critical appraisal, since the articles have not undergone the same critical appraisal as the articles from McMasterPLUS and Cochrane library".

Another aspect of critical appraisal may be to justify the selection of information resources and types of information related to the S-

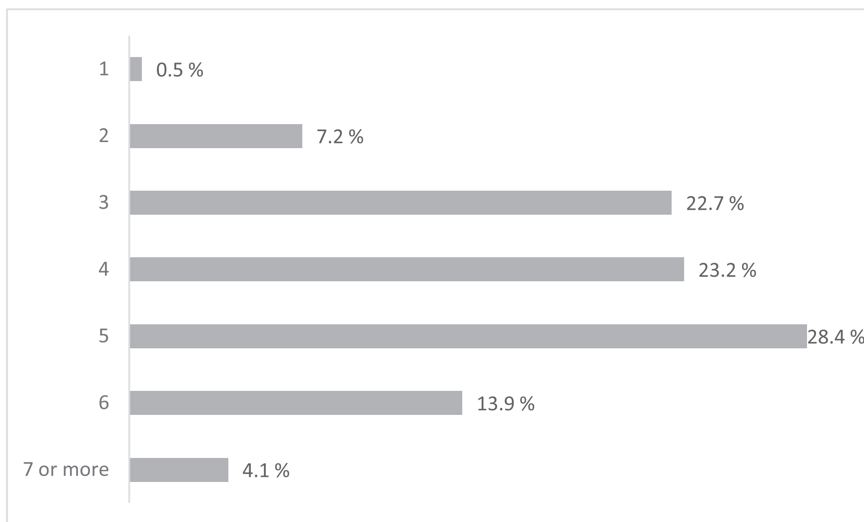

Chart 1. Sum of search engines and databases used in each thesis (N = 194).

Table 2
Selected information types (N = 194).

Information types	Frequency	Percentage
Original research articles	194	100
Legislation	174	90
Ethical guidelines for nurses	170	88
Reviews and other research syntheses	151	78
Guidelines	126	65
White papers/Official documents	87	45
Point-of-care tools (UpToDate/Best Practice)	85	44

Pyramid. References to the S-Pyramid increased significantly over the three years ($p < 0.001$). The following examples illustrate these justifications:

> "I have selected articles from the different layers of the S-Pyramid. I have consciously excluded articles from the lowest level, because the articles on higher levels are critically appraised, comprehensible and applicable".

> "An important principle in EBP is to use research syntheses, such as systematic reviews. Thus, I decided to start my search in McMasterPLUS, which is inspired by the principles behind the S-Pyramid".

> "The following databases are slightly different, and were chosen to complement each other. They have content on different levels of the S-Pyramid".

Several students connected their thesis writing to EBP generally:

> "By carrying out a literature review I can, as a student, develop my skills to critically appraise and reflect upon research content and its relevance to my practice. I think that through using literature review as a method, I will become familiar with how I can acquire research-based knowledge as a step of working in an evidence-based manner".

Assessment of the theses is based on the ECTS grading scale ranging from A to F. In Norway, A, B and C are characterised respectively as

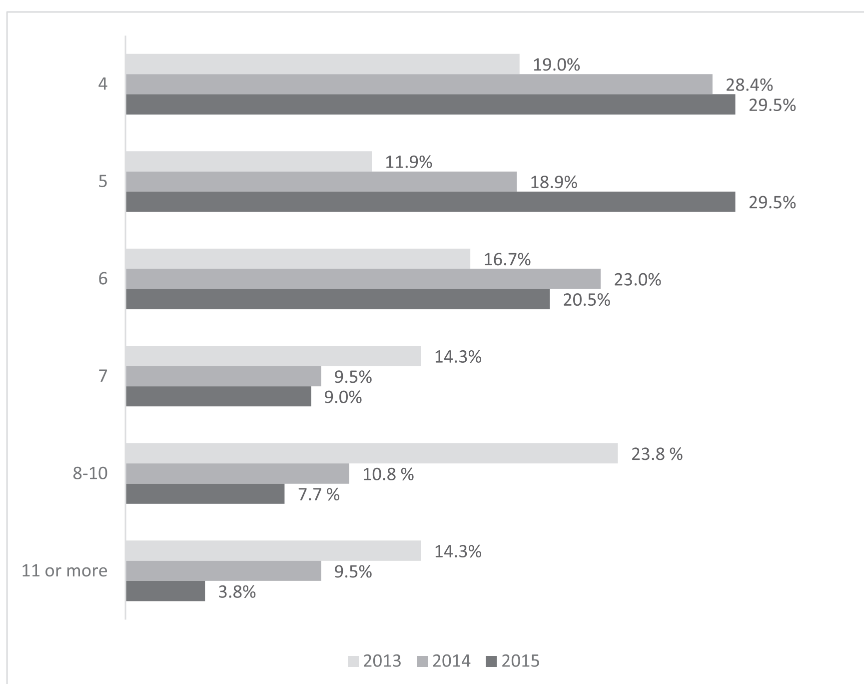

Chart 2. Sum of included research articles.

Table 3
Development in use of EBP-tools in theses submitted from 2013 to 2015.

EPB-tools	2013 (%)	2014 (%)	2015 (%)	p-Values 2013–14	p-Values 2014–15	p-Values all three years
McMasterPLUS search	40.5	75.7	74.4	< 0.001	0.853	< 0.001
Referring to S-Pyramid	19.0	32.4	82.1	0.123	0.001	< 0.001
Use of Point-of-care tools	21.4	54.1	46.2	< 0.001	0.333	0.003
Use of guidelines	71.4	66.2	60.3	0.567	0.450	0.454
Cochrane search	23.8	24.3	43.6	0.951	0.012	0.017
Checklist appraisal	40.5	44.6	55.1	0.670	0.197	0.236

'excellent', 'very good' and 'good' performance. These grades regard the student's judgement and independent thinking, and form the basis for admission to graduate education. The grades D, E and F respectively represent 'limited', 'very limited' and 'an absence of judgement and independent thinking'. The number of theses awarded A, B or C, during the three year intervention, increased from 66.7% in 2013 to 74.3 in 2014 and 82.1% in 2015. A correlation was found between grading and critical appraisal. The *p*-value was 0.015 between grading and providing justification related to the S-pyramid, and 0.004 between grading and using checklists for critical appraisal.

4. Discussion

The aim of this study was to evaluate a collaborative library-faculty teaching intervention by examining nursing students' theses submitted between 2013 and 2015 in a Norwegian undergraduate nurse training programme. The teaching intervention was intended to enhance the students' research skills according to EBP.

The main findings demonstrate that research use according to EBP has improved during the course of the three years of library teaching transformation. There is an increase in employing most EBP-tools; some tools use only slightly increased over the three years, and the use of others was more extensive. According to Dicenso et al. (2009), a literature search should begin at the highest possible level of the S-pyramid. McMasterPLUS enables the students to do a quick search at all levels of the S-pyramid simultaneously. Table 3 shows almost a twofold increase in the use of this tool from 2013 to 2014. Nearly three quarters of the theses submitted made use of this search engine in 2014 and 2015. This indicates a broad awareness of one of the most important principles in EBP. Over the same period there is also a doubling in reference to Point-of-care tools, which are at the top of the pyramid. Searching the Cochrane database also increased significantly from 2014 to 2015. This equally reflects a raised awareness of the research sources. Surprisingly, the use of guidelines slightly dropped over the same period, possibly in favour of the increased use of McMasterPLUS and the other databases. Guidelines are considered as substantiating information for theses, however, they do not count as research articles.

As highlighted by Dicenso et al. (2009), Straus et al. (2011) and Limberg and Folkesson (2006), critical appraisal skills are required alongside the capacity to select and search the most relevant databases. In this study, critical appraisal was evaluated through student's use of checklists and justifications for the selection of literature, for example, with references to the S-pyramid. While checklist appraisal increased only slightly over the three years, making references to the S-pyramid increased considerably (Table 3).

A positive correlation was found between grading and these critical appraisal skills. The relationship between grades and specific variables is complicated, but it may be reasonable to assume that critical appraisal skills can be considered part of good judgement and independent thinking, which are the characteristics of the A–C grades. An important aspect here was a clear tendency that the theses from 2013 only mentioned that checklists had been used, while more of the 2014 and 2015 theses additionally demonstrated *how* the checklists had been used. The students not only knew that they should use checklists, but they were additionally demonstrating judgement and independent thinking related to critical appraisal.

The overall grades were very good in all three years, and the number of A–C grades progressively improved from 66.7 to 82.1% over the three years. Getting a good grade is important for these students to be accepted to do further education, which is a career goal for many students these days. However, there was no statistical significance between grading and other variables than critical appraisal in this study, neither the number nor the kind of research articles. According to Chart 2, most theses included four to six research articles, the minimum requirement, however, the most frequent number research articles included in 2013 was eight to ten. The number articles referenced was even decreasing from 2013 to 2014 and 2015. The explanation may be the new thesis requirements; to properly describe and appraise each selected article, which is very time consuming and requires use of many words. Moreover, the students are used to including a defined number of research articles in other assignments, and may also in this case have considered four referenced articles as the "right" number. Using EBP-tools and sources are not requirements for the thesis, and it is possible that a reasonable content, demonstration of critical appraisal skills and compliance with the minimum requirements results in a good grade.

The extracted quotes in the results section illustrate that the different rationale made for many of the choices are clearly connected to EBP. There are examples of searching for experts in Google and YouTube to find the best information. Often, even the patient perspective is included in the thesis introduction as a patient case. This makes both patients, experts and researchers visible in the spirit of EBP (cf. Straus et al., 2011). The EBP reasoning was found to a much greater extent in the 2014 and 2015 theses. The qualitative results also demonstrate that the nursing students seem to put great efforts into their theses. PICO, search history and referencing were, in general, managed correctly. This indicates that the library teaching content, the learning goals and thesis requirements are consistent in this case (cf. Limberg and Folkesson, 2006).

The overall results of this study demonstrate the students' ability to practice in their thesis writing what they have learnt about research application in EBP. The findings are related to the previous research findings about the importance of strong library-faculty collaboration and the engagement in each other's professional domain (Bønløkke et al., 2015; Cader et al., 2006; Friberg and Dahlborg-Lyckhage, 2013; Nayda and Rankin, 2008; Sundin et al., 2008). Additionally, the suitability of practising research skills while writing a thesis over some weeks, is probably an important explanation for the success of this intervention (Friberg and Dahlborg-Lyckhage, 2013; Lundgren and Robertsson, 2013; Mattila et al., 2005). However, while some of the previous research claims that it is challenging to teach research skills to nursing students, the present study finds that it is possible to accomplish good results by systematic and collaborative library-faculty teaching throughout the three-year nurse training programme. Timing and integration of this teaching with respect to curriculum assignments are believed to be essential (cf. Barnard et al., 2005; Duncan and Holtslander, 2012; Klem and Weiss, 2005).

4.1. Methodological Considerations

The only new requirements during the three years were inclusion of

the search strategy and PICO. The information in these forms is additionally included in the methods section of the thesis in all three years, thus, the new requirements are not likely to influence the results. There are no known differences between the students in the three graduation years due to qualifications, and they were offered the same guidance from librarians and nurse educators. The theses were collected from three final years of only one nurse training programme, thus, it is not possible to generalise the findings of this study.

5. Conclusion

This study concludes that the collaborative library-faculty teaching intervention employed has been successful in the promotion of nursing student research skills according to the EBP principles. One indication of this is the increase of the upper grades from 66.7 to 82.1% and the correlation between grades and critical appraisal skills. Additionally, more students wrote an individual thesis in 2014 and 2015, which may indicate a greater confidence in this regard. Writing a thesis in the undergraduate nursing programme is important to develop and practice research skills. From the teaching side, the development of a systematic library-faculty collaboration is crucial. This ensures that library teaching input is directly applicable and accommodates the student's needs at the right time. A strong library-faculty collaboration may additionally contribute to professional development of both, which is essential to improve teaching and supervision of the students. However, there are still some remaining issues relating to the implementation of EBP in clinical nursing. For instance, even if these students have the research skills, will they be able to transfer them to their workplace? How will these skills be encouraged in everyday clinical nursing practice, and how can the gap between theory and practice be reduced? These are questions that need further investigation. This study can contribute to improvements in teaching research skills for EBP, and emphasises the value of library-faculty collaboration and thesis writing in this regard.

Authorship Contributions

The first author acquired the data and was drafting the article. The second author acquired the data, and the third author did the statistical analysis. All authors contributed to the design of the study, interpretation of data, revision of the intellectual content, and approval of the article for submission.

Conflicts of Interest

The authors declare no conflicts of interest.

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Article 2

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Handling inconsistencies between information modalities - workplace learning of newly qualified nurses

Anita Nordsteien

Introduction. Information-related activities of nurses touch on questions of life and death, this makes their work life challenging, particularly when dealing with inconsistencies between different information sources. This paper provides insights into how, when and why newly qualified nurses respond to these information contradictions.
Methods. A longitudinal ethnographically inspired study was conducted on a nurse training programme in a hospital in Norway. Focus groups and interviews were used to collect data from 25 newly qualified nurses.
Analysis. Thematic analysis was carried out with NVivo10, and three themes were identified: reliance on information, challenging practice and complying with practice.
Results. Participation in a training programme appears to affect how newly qualified nurses handle information inconsistencies. Training-nurses seem to rely on theoretical information, and use this to substantiate and challenge existing practices. The new nurses adapt to the routines on their wards, but have a strong impetus to improve practice promoting their prior knowledge, motivation and values.
Conclusion. Theoretical information plays a major role in new nurses' learning processes; they exchange this information with experienced colleagues in return for experiential information about critical situations. This generates mutual learning and development of practices in organisations.

Introduction

A central issue in information studies is how information is used in the workplace context (cf. Case, 2012). Hospitals are complex information environments, and health care professionals have to learn to

handle different and sometimes contradictory types of information (Bonner and Lloyd, 2011; Isah and Byström, 2016; Lloyd, 2009). Information work and negotiations between health care professionals are a substantial part of the work tasks in hospitals (Strauss, 1985). Nurses are a particularly interesting case for information studies for several reasons; they are the largest occupational group in hospitals, and pivotal for information processes between patients and their relatives, physicians and other health providers. Moreover, these information processes often deal with critical situations; the consequences may be fatal if information is not handled correctly. The view on information is, in this study, inspired by Lloyd (2010, p. 12), who describes information as a '*product of a negotiated construction between individuals interacting with the artefacts, texts, symbols, actions and in consort with other people in context*'.

Workplace learning is a well-known research area in pedagogical and organisational contexts (Fenwick, 2008), but there are only a few information studies related to workplace learning (e.g. Bonner and Lloyd, 2011; Isah and Byström, 2016; Lloyd, 2009; Moring, 2011). Workplace learning is embedded in everyday work activities (Billett, 2014; Fenwick, 2008). All employees at the workplace are continuously learning (Billett, 2008), but learning may be particularly intensive for newcomers to a workplace (Edwards, Hawker, Carrier and Rees, 2015; Moring, 2011). One significant challenge can be the transition from an education environment to the workplace (Eraut, 2004; Lloyd, 2009, 2011). Recently, several training programmes for new nurses have been established to ease this transition process, and thereby prevent nurses leaving their workplace or profession already in the first year (Edwards *et al.*, 2015).

There are a vast number of information studies about different occupational groups (cf. Case, 2012). Some of the more recent studies about the nursing profession explore information sources and activities in everyday nursing practice, which are generally related to daily administrative tasks, such as documentation and rapid reference enquiry textbooks, procedure handbooks and Internet use for practical information about diseases, diagnoses and procedures (Ebenezer, 2015; Hedman, Lundh and Sundin, 2009; MacIntosh-Murray and Choo, 2005; McKnight, 2006, 2007). Factors that influence nurses' relation to information are mainly time constraints (Ebenezer, 2015; McKnight, 2004; Spenceley, O'Leary, Chizawsky, Ross and Estabrooks, 2008). However, Spenceley and colleagues (2008) indicate that healthcare and nurses' information needs seem to change according to the demands for evidence-based knowledge and narrowing the research-practice gap. Another highly relevant focus is on the new generation of nurses; dealing with theoretical nursing information as a professional project, and its impact on nursing identity and power relations in the workplace (Johannisson and Sundin, 2007; Sundin, 2002, 2003; Sundin and Hedman, 2005). All these studies mainly focus on textual information sources. An exception is Bonner and Lloyd (2011), who emphasise the importance of social and physical information sources in nursing practice.

Still, newly qualified nurses and the transition between nursing education and the workplace have received little attention in information studies. This study aims to supplement previous knowledge by focusing on information challenges of newly qualified nurses' and the potential of training programmes for newcomers in the workplace. This paper addresses the following research question: How do newly qualified nurses handle inconsistencies between different information modalities in the workplace?

Theoretical perspectives and concepts

The theoretical framework of this study is based on practice-oriented theories related to workplace learning (Benner, 1984; Billett, 2014; Lloyd, 2010; Wenger-Trayner and Wenger-Trayner, 2015). These theories claim that learning is social and embedded in practice. Wenger-Trayner and Wenger-Trayner (2015) emphasise that members of a community bring their personal experiences to a practice, which may challenge and change the socially defined competence of the community. However, most commonly the community transforms the experiences of individuals to align with the defined competence. Thus, inconsistencies between experience and competence are constantly negotiated, and learning happens through this process:

> Learning to become a practitioner is... developing a meaningful identity of both competence

> and knowledgeability in a dynamic and varied landscape of relevant practices... Practitioners need to negotiate their role, optimize their contribution, know where relevant sources of knowledge are, and be practiced at bringing various sources of knowledge to bear on unforeseen and ambiguous situations.(Wenger-Trayner and Wenger-Trayner, 2015, pp. 23-24)

Another related view is that learning through work includes workplace affordances, its invitational qualities and how individuals choose to engage with these (Billett, 2014; Hodkinson *et al.*, 2004). Individuals bring their prior knowledge, experiences and skills, which they adapt and develop to their new workplace (Hodkinson *et al.*, 2004). Fuller, Hodkinson, Hodkinson and Unwin (2005) find that newcomers in some cases are considered to be the experts (having the most up-to-date knowledge), and are passing on this knowledge and skills to their experienced colleagues. These contributions emphasise that social structures and individual agency are relational and interdependent, and that individuals construct knowledge and bring about both individual and social change when employing their capacities, interests and values in work. This is related to Giddens (1984), who promotes the idea of an equal emphasis between these social structures and human agency as a mutually repeating duality. Giddens' social structures include rules and resources that shape human agency, but these can be changed when humans reproduce them differently in their activities.

Practice-based learning in nursing is elaborated on in the influential study of Benner (1984). Benner applies the Dreyfus model to nursing, which suggests that nurses move through five competency levels in their learning process: novice, advanced beginner, competent, proficient and expert. The individual nurse's competence develops by a move from 1) reliance on theory, rules and procedures to the use of personal experience from concrete situations, 2) the view of a situation as a collection of equal parts to a complete whole with certain relevant parts, and 3) the act of a detached observer to an involved performer. The expert has a deep intuitive understanding of situations that involves tacit knowledge (Benner, 1984).

In information studies, Lloyd (2010) has connected different types of information to practice-based learning. Knowing is attached to information modalities, which refer to '*broad sites of information that are established within a context*' (p. 161). Lloyd describes epistemic modalities as sites of factual and disciplinary know-why and know-that information: e.g. textbooks, guidelines and procedures. The social modalities are sites of information acquired through social interaction and reflection, e.g. experiential information, values and beliefs; tacit shared understandings that may contest epistemic information. The corporeal modalities represent the embodied know-how or practical tacit information acquired through sensory input, demonstration and observation of practice. Information coupling is the process where these modalities are drawn together, and newcomers become full participants of the practice. Experienced members introduce newcomers to the legitimised information and knowledge sites in the domain (Lloyd, 2010).

Methods

This paper presents some initial findings from a qualitative study in a two-year training programme for newly qualified nurses in a large community hospital in Norway. An ethnographically inspired approach was applied, involving different types of data collection over time to record how experiences potentially change when the individuals become more confident in their context (Grbich, 2013). The training programme was established in August 2014 to enhance the nurses' generalist competence by providing each nurse an opportunity to work on surgical, medical and psychiatric wards for periods of eight months. Clinical placements during their three-year undergraduate nursing education are normally 8-10 weeks in each of these fields (in addition to 20 weeks in community health services). The training-nurses have no preceptor or other support beyond what other new nurses have. However, the training-nurses meet once a month to participate in practical exercises and lectures concerning relevant procedures (instructions on how to perform patient-related tasks, such as catheterisation) in the hospital. To become a participant in the training programme, they are required to go through a normal job recruitment process.

Sample

In August 2014, 12 newly qualified nurses were recruited to participate in the training programme as well as in this study, and in August 2015, six more nurses were recruited. Additionally, newly qualified nurses not participating in the training programme were recruited to highlight possible differences in information-related activities between those involved in training and those not. A list provided by the hospital wards of 15 new nurses in the summer of 2014 made it possible to contact them, and seven nurses agreed to participate. These nurses are working either on a surgical or medical ward; the majority are working 75% part-time in a temporary position, which is normal for the first years of employment. None of these seven nurses were applying for a position in the training programme. They explained that they wanted the stability of working on only one ward. Most of them were employed on the ward where they had their last clinical placement during their nursing education. In total, the participants included 22 women and three men aged between 24 and 48.

Data collection

This paper presents the findings from the initial focus groups and interviews. Focus groups were chosen as a data collection method, because of the possibility to acquire concentrated data through group interaction on a specific topic (Morgan, 1997). Semi-structured interview outline was e-mailed to all the participants a week prior to each focus group discussion. The first series of focus groups were conducted during the nurses' first months in the workplace. This included two groups of six training-nurses in 2014, and one group of four training-nurses recruited in 2015. It proved impossible to gather the non-training-nurses for a focus group due to their varying work shifts. As a result of this two interviews were conducted with two of the non-training-nurses and one interview with another three. The second series of focus groups and interviews were conducted a year later; two focus groups of respectively five and six training-nurses and one interview with three non-training-nurses. An iterative approach was used, striving to reach data saturation and construct meaning together with the participants (Grbich, 2013).

Independent of the number of participants in each group, all discussions proved to be engaging and interactive. The nurses explained that they were used to discussing and responding to each other in reflection groups during their education. All the focus groups and interviews lasted about 60 minutes, and they were digitally recorded and transcribed verbatim into 170 pages. The first series of data collection involved questions concerning how the nurses use different information sources to cope with the theory - practice gap and the transition between education and workplace. Preliminary data analysis was undertaken during both data collection and transcription (Grbich, 2013). One of the main themes that appeared was handling conflicting information from different information modalities, and this theme was further elaborated on in the second series of discussions.

Ethical considerations

The researcher gained access to this study field, because the hospital sought an external partner for the evaluation of the training programme. Due to being viewed as an external partner, the participants seemed to talk freely about their situation at the hospital, thus it is extremely important to protect the confidentiality and anonymity of the participants. Written informed consent was obtained from all the participants and a representative of the hospital management. Names of the participants were replaced and assigned codes from N1 to N25, and names of the hospital and wards were removed in the transcriptions. The Norwegian Social Science Data Services approved the study in June 2014 (project no. 39107).

Data analysis

Thematic analysis was conducted using NVivo10, inspired by the interpretative framework in table 1 of Brinkmann and Kvale (2015). This consists of three interpretative levels of increasing abstraction: self-understanding represents the condensed meaning of the participants' statements; a critical common-sense understanding means critically interpreting the content of statements or what statements may tell about

the participants; a theoretical understanding connects statements to theory. In this paper the theme of information inconsistency is in focus. Through the data analysis, three sub-themes were identified: reliance on information, challenging practice and complying with practice.

Table 1: Interpretative framework

Self-understanding	Critical common-sense understanding	Theoretical understanding
The new nurses related that their skilled colleagues handle critical situations very quickly; their hands just seem to know what to do and what will work	Complying with practice: Experienced nurses as role models in critical situations	Social structure: Competence of community Deep intuitive understanding Corporeal information modalities
Member validation	Audience validation	Peer validation

According to this framework, validation should be conducted by discussing each of the three different types of understanding with the respective participants (members), general public (audience) and research community (peers). This will be elaborated on later in the methodological considerations.

Findings

The three sub-themes that emerged through the analysis are interconnected; the new nurses have to decide what information to rely on, and challenging practice and complying with practice include findings on *how, when* and *why* the new nurses behave in the face of inconsistencies.

Reliance on information

Both groups of nurses related that there is a strong focus on complying with the medical procedures in the hospital information system. They explained that these research-based procedures are regularly updated, therefore, all employees are supposed to consult the procedures before conducting patient-related tasks. Even a year after starting their employment, the training-nurses reported that they consult procedures on a daily basis. However, there is often no time to locate and read the procedures during a shift, and some of the them expressed that they sometimes print out specific procedures to read at home in their spare time, so they can prepare for forthcoming work tasks. In cases where they are not able to prepare, the training-nurses reported a culture of consulting experienced colleagues as well as other health professionals. However, several of the training-nurses have experienced getting inaccurate answers when they ask their colleagues about procedures:

> There are experienced nurses to consult and a very good culture of asking questions, but I read the actual procedure before I go to the patients, because I can’t trust that colleagues are up-to-date on procedures, I’ve experienced that colleagues say something quite different from the current procedures. (Training-nurse N4)

A strategy used if the training-nurses felt that the information was incorrect was to ask another colleague. These nurses claimed that they ask colleagues a lot, but when it comes to procedures that they do not know, they double-check. They related that some of the most experienced nurses seem not to confer the up-dated procedures very often, or they claim that a procedure is wrong, and choose to do it another way. However, there were some cases where the experienced nurses told the training-nurses not to listen to them in case they were wrong, but to consult the procedure and come back and tell them what the right answer is.

The non-training-nurses pointed out that there might be reasons for deviating from the procedures in some

cases, and there were several examples of trusting experienced colleagues without conferring the procedures:

> When you've got a lot to do, you don't look up the procedure [...] then you rather go and ask the nurses who have been working there for three years how they do it, without knowing 100% if the response is right according to the procedure-system. (Non-training-nurse N15)

> They may not be the safest information source, as you said, when changes occur frequently, but they have worked here for several years and know a lot, and one has to have confidence in experienced colleagues too, sometimes at least. So, I ask a lot of questions, since I've only been working as a nurse for a year. (Non-training-nurse N14)

The medical procedures appear to be considered as the most legitimate information source for all nurses, but owing to time constraints, consulting colleagues emerges as the most frequent practice. However, getting inaccurate answers frustrates the new nurses, because they are afraid of doing anything wrong. Several of the non-training-nurses related that they were given too much responsibility without knowing about emergency procedures and other critical situations. They reported that they were anxious that patients would die on their shift, thus they constantly checked upon their patients and even dreamt about patient situations at night.

Challenging practice

There are several examples, which indicate that the training-nurses are substantiating, questioning or challenging existing practices, even in the first months, when they are new to the workplace. These nurses bring epistemic knowledge from their education and the training programme. Many of the training-nurses said that they have insisted on doing specific tasks according to their epistemic knowledge, and not the way some of the experienced nurses do it. They related that their colleagues most often seem to be fine with that, but that they want to continue doing the tasks the way they always have done them. There are also some examples when the training-nurses have succeeded in convincing the experienced nurses, and have actually changed the practice on a ward.

The training-nurses expressed that it is important to live up to their own professional standards, and find their own identity as a nurse:

> I've experienced that nurses tell me not to do it that way [...] I want to do it that way, that's what I'm comfortable with [...] You should maintain your good habits, although other nurses tell you not to do it that way, because they're not used to it. This is the way I do it, because I know it's justifiable and right. (Training-nurse N3)

> Yes, that's how to find your own identity and your professional standards [...] Even though the other nurses do it that way, I'll not, I can't justify doing it that way, because I want to be a skilled professional [...] In a way, it's your responsibility to seek and acquire the knowledge you need. (Training-nurse N2)

> You have to feel on your own, how you want to practice. (Training-nurse N8)

A theme that was discussed in the focus groups with the training-nurses was how to deal with situations when other nurses do something procedurally incorrect. Different strategies were used; most frequently asking carefully for an explanation. In other cases, telling the colleague that the procedures or other written sources indicate that it should be done in a different way. There were even examples of reporting errors electronically and notifying a superior:

> It's important to report errors, otherwise the routines degenerate and people do things differently, and then it becomes very difficult without any continuity on the ward. So, you have to tighten procedures to get everybody on track again. (Training-nurse N20)

> If you come to a ward where you notice that there is a culture where it's not okay to speak out, then we as newcomers should try to initiate it. [...] I want to be up-to-date on the most recent information. I want to tell the patient that: 'The most recent research shows…' I want to be the best nurse. (Training-nurse N21)

Most commonly, the training-nurses appear to be respected and acknowledged for their epistemic knowledge. They reported that their nursing colleagues as well as the physicians listen to their clinical assessments.

The non-training-nurses also reported several occasions of questioning practice:

> When you're a newcomer and try to convey new knowledge, it's sometimes not appreciated. When we do as we've learned in our education, someone will come and tell us that we're wrong: 'No, don't do it that way'. 'Oh! Why? 'No, we do it another way here, that's how we've done it for 20 years'. 'Oh, okay'. (Non-training-nurse N13)

However, the negotiation processes of the non-training-nurses seemed to end at the initial questioning. Some of these nurses related that they did not want to further confront the experienced nurses as, in contrast, the training-nurses generally did.

Complying with practice

In certain situations, both groups of newly qualified nurses comply with practice. The outlined scenario in table 1 covers cases of critical situations like sudden cardiac arrest, which the experienced colleagues are characteristically said to handle swiftly and in an automatic manner. One non-training-nurse expressed that she feels confident with the routine-work, but not so much acute situations:

> I may observe that they [patients] become critically ill, and I document my observations, and inform the physician, but the quick responses... They [the experienced nurses] just say "I do it like this and then that…" They do it so fast. I hope I will be like them in a few years. I'm not just standing there doing nothing, but I see that they have it at their fingertips, and they know what works. (Non-training-nurse N14)

The training-nurses simulate such real life situations several times during their programme, and they express less concern about potential acute situations that may arise than the non-training-nurses. However, both groups of nurses acknowledge that they have to be exposed to several such situations to be able to handle them.

Research-based tools for improving patient safety have recently been implemented in the hospital concerned; one example is Modified Early Warning Score (MEWS), which is an assessment tool aiming to efficiently communicate patients' condition between the staff in the hospital. The training-nurses are thoroughly informed and trained to use such tools, and expressed that they feel confident with these tools and find such overall guidelines useful. They even promote them amongst their experienced colleagues, who are more reluctant to use them, because they have not been given the same information and training to use such tools.

In cases when the procedures are inconsistent with the theoretical knowledge from the educational context, both groups of newly qualified nurses seem to reluctantly comply with the procedures:

> I have changed the way of doing this task, because now there is a new procedure. I have to comply with the procedure-system, even if I did it differently during my education. (Non-training-nurse N14)

The same thing also happens with regard to the daily routines on the wards and how work is organised. Some of the wards are said to be highly structured and characterised by teamwork and a good flow of information, while in others new nurses may be left more on their own and everything is more fluid. This

is illustrated by the number of initial training days, which varies considerably between the wards. Some nurses reported having two training days before starting to work on their own, while others got three weeks. There was no difference between the two groups. However, the training-nurses seemed to get into their wards' daily routines very quickly, but it was challenging for them to change ward after eight months, dealing with a completely different culture, information processes and way of working:

> It was okay to change to another ward, exciting... Nice people. But there are things you have to unlearn; some of the routines you acquired on the previous ward. (Training-nurse N10)

Both groups of nurses adapt to the routines and the way of working on the ward they are allocated. They comply with tools, guidelines and procedures they are supposed to use in the hospital, and they acknowledge the experience of their colleagues when it comes to critical situations.

Discussion

Information-related activities are a significant part of workplace learning of newly qualified nurses. However, to be confident and competent nurses, they have to learn how to handle inconsistencies, and in some cases contradictions, between information sources. The first findings from this on-going ethnographically inspired study indicate that participation in training programmes affect how newcomers handle information inconsistencies. The training-nurses seem to rely more on theoretical information, and use it to substantiate and challenge the practices of their more experienced colleagues. In such cases, epistemic knowledge is being used to contest social knowledge. This finding appears to be contrary to what is usual, and contradicts the notion that experienced members in a workplace hold the power and introduce newcomers to the legitimised socially shared knowledge (cf. Lloyd, 2010). As the present findings demonstrate, the relationship between these training-nurses and their experienced colleagues seems to be more equal. The type of information need decides which party might have the most relevant information, and who is the tutor and who is the learner. The training-nurses share the newest epistemic information with their colleagues in everyday situations, while in critical situations they turn to the skilled experienced nurses holding the experience-based tacit knowledge required (cf. Benner, 1984; Lloyd, 2010). This interchanging of information sharing enables mutual learning in the workplace, which in turn leads to the development of practices.

Complying with practice seems mainly to be related to social structures (cf. Giddens, 1984); both groups new nurses adapt to the routines and the way of working on the ward they are allocated. They comply with tools, guidelines and procedures they are supposed to use in the hospital, and they acknowledge the experience of their colleagues when it comes to critical situations. They are not yet able to handle complex situations requiring personal experience and a holistic understanding using various knowledge sources, which also Wenger-Trayner and Wenger-Trayner (2015) emphasise. The nurses are aligning with the context and the desired competence of the community in such cases. However, the non-training-nurses trust and comply to a greater extent with their experienced colleagues in all situations, contrary to the training-nurses who in everyday situations constantly negotiate their role and use personal experience, and challenge the competence of the community.

Challenging practice is connected to individual agency, which constitutes a strong impetus to improve practice by questioning and substantiating based on the individual's prior knowledge, motivation and personality. The training-nurses clearly transfer their prior knowledge to the workplace, mainly from their educational background, but also from former work experiences. They use the knowledge from these settings to at times contest the practices at hospital. New nurses are working more or less on their own after two days of training, even when facing critical situations. As with the studies of Billett (2014), Fuller *et al*. (2005) and Hodkinson *et al*. (2004), individual agency seems to be a prominent factor in these findings; here there are aspects of motivation, personality and integrity, which affect the response to practice. Moreover, workplace affordances (cf. Billett, 2014; Hodkinson *et al*., 2004), such as training programmes, appear to be important.

Sundin (e.g. 2002; 2003) found that dealing with scientific information may be used as a strategy by the

new generation of nurses to increase their professional status and identity. However, the main reason for relying on scientific information in this study seems to be a genuine commitment to the patients' well-being; providing the patient with the best treatment possible. These training-nurses are ambitious, they want to be skilled professionals and conduct their work optimally, and the community in which they are working usually appreciate this attitude. In this context, epistemic and especially scientific knowledge seem to have more impact than reflected in related studies previously. 25 years of evidence-based practice may be one explanation for this (cf. Spenceley *et al*., 2008), but also that new generations of nurses want to be knowledgeable; they want to refer to research in their practice, and this is a trend seen in society at a large, which as such can be seen as a continuation of the development of the nursing profession that Sundin addresses.

Methodological considerations

This study will not be representative for nursing practice in general, because the context is a specific training programme in a country with relatively equal relations within and between professions. Moreover, the participants are selected and regarded as highly skilled. There is also an imbalance in the number of participants of the two groups of nurses, which makes it difficult to compare the groups. However, the study gives some indications of what can be accomplished by suitable workplace affordances for learning. Member validation (table 1) of the main findings of this study was conducted through a meeting with the participants (cf. Brinkmann and Kvale, 2015). The training-nurses confirmed what information they rely on and in what situations they respectively challenge or comply with practice. Audience validation was conducted through evaluation meetings with the training-nurses' managers and trainers, who confirmed and were enthusiastic about the new epistemic impulses the training-nurses bring to their wards and their impetus to substantiate practice. Peer validation was conducted by presenting and discussing the findings with both nursing and information science researchers.

Conclusion

The findings of this study emphasise the importance of the affordances of the workplace environment to support new employees' ability to handle conflicting information. These affordances relate both to the openness of the employees to new information and the opportunities in the workplace for sharing information. This study demonstrates that a workplace training programme can facilitate new employees' transition between education and the workplace. This process takes place by acknowledging and supporting the newcomers' up-to-date epistemic knowledge, and by demonstrating how this knowledge can be integrated with practical knowledge and experience. The participants in this workplace training programme want to ground their clinical patient work on epistemic information. The new generation of nurses seem to be comfortable navigating in the digital information landscape; they know where to find reliable information and how to use it, which has become a critical skill in health care. The new nurses share this information with their experienced colleagues, who in turn share experiential information about how to handle atypical or critical situations with the new nurses. Thus, the training-nurses are both tutors and learners, and this enables the information sharing to be fluid and less hierarchical, since different information is needed for different work tasks. This exchange of information allows mutual learning between experienced and new members in a practice. In conclusion, the training-nurses are not passively transitioned into the practice and sustaining it; there appears to be a significant degree of transition of practices when these nurses are supplementing or countering them. These findings point to areas of information practice research that are less studied, but that are clearly of value for better understanding information sharing in organisations and the development of practices.

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Transitions in workplace information practices and culture in healthcare: the influence of newcomers

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Abstract

Purpose – This study aims to empirically investigate how new healthcare professionals engage with information practices and information culture in their workplace, and the resulting influences on development and change.
Design/methodology/approach – A longitudinal study was conducted on a hospital training programme. Three series of focus groups provided data from 18 recently qualified nurses, supported by observations. The data was thematically analysed applying a framework consisting of six approaches to information use.
Findings – Newcomers take a proactive approach to seek, use and share scientific information, which is negotiated within existing information practices and organisational information culture. Their competencies, such as research skills, values, motivation and sense of integrity to use and share scientific information, often differ from those existing workplace practices. For this reason they drive towards renewal and change.
Practical implications – Examination of organisational approaches to information use indicates clearly the necessity for improvements to meet the needs of information proactiveness and thus be able to face challenges and changes in an organisation.
Originality/value – This work sheds new light on newcomers' information use, as they integrate into a workplace and interact with information practices and organisational approaches to information use. A significant contribution is the identification of the dynamics and interdependencies between newcomers' individual agency in their way of seeking, using and sharing information, and the established community's social agency promoting existing information practices and the organisational agency represented by information culture.

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Introduction

This paper explores the relation between newcomers, workplace information culture and profession-bound information practices in an organisation. In the context of this study, the *newcomers* are recently qualified nurses in their first two years of work in the profession. Newcomers are in a process of movement from the periphery towards the core of their work community, this happens through learning and aligning their own performance to that of the community's work practices (Lave and Wenger, 1991). Among others, Gherardi (2006, p. 97) claims that: "Learning to become a competent member within a culture of practice is a process by which novices appropriate – within a culture of unequal power relations – the 'seeing', 'doing' and 'saying' that sustain this practice". However, this is a two-way process. Newcomers may have experiences that are not part of the existing competence in the community. The old-timers need to adjust to evolvements of the practice and the meaning of the practice is constantly renegotiated (Wenger, 1998). Several researchers emphasise that newcomers bring new knowledge, experiences and skills to the workplace, and that the newcomers choose how to engage with different learning opportunities (e.g. Billett, 2014; Fuller et al., 2005; Hodkinson et al., 2004). Fuller and colleagues (2005) found that newcomers in some cases were even considered experts, since they passed on new knowledge and skills to their community of practice. In this study, newcomers are viewed as both learners and educators.

Information culture is an elusive concept that has been defined in many different ways, ranging from an all-inclusive view on organisations' information and communication issues, to a more specific focus on how employees relate to information. In this study, *information culture* is seen as those organisational aspects that influence the use of information, or as described by Choo and colleagues: "the socially transmitted patterns of behaviors and values about the significance and use of information in an organization" (Choo et al., 2006, p. 492). The related concept of *information practice* refers to "information related activities and skills, constituted, justified and organized through the arrangements of a social site, and mediated socially and materially with the aim of producing shared understanding and mutual agreement about ways of knowing […]" (Lloyd, 2011, p. 285). Thus, information practice may be regarded as the role of information in activities in social settings, such as communities of some kind (cf. Cox, 2012). In contrast, information culture applies more readily to approaches to information use and its role in different activities from an organisational perspective, rather than the perspective of a community. In organisational contexts, information practice is a better term to refer to information related activities among organisationally unformalised communities consisting of people sharing both professional purpose and context of work, whereas information culture relates more readily to formal organisational constructs, such as departments or specially assigned teams. Apart from this paper, the difference is often elusive and not reflected on, let alone agreed on, which means that both terms may be used interchangeably in research literature. Moreover, the two are related, since certain information practices can partly be seen as a manifestation of values, rules and norms that are also considered as core aspects of information culture (cf. Choo et al., 2008).

In order to focus the present research, one fundamental aspect of information culture has been selected, and in this paper referred to as *approaches to information use*. According to Choo (2013), this aspect of information culture has been under explored, despite its presumably strong influence on information related activities of both experienced professionals and newcomers. Thus, this study aims to empirically investigate the dynamics between newcomers, communities' information practices and organisational information culture. The

first research question addresses how new healthcare professionals engage with professional (meaning: belonging to a profession) information practices and organisational information culture surrounding these practices:

RQ1. How do newcomers experience and respond to existing approaches to information use in an organisation?

The second research question explores the mechanisms of development and change as a result of this interaction:

RQ2. How do newcomers and information practices develop through interaction?

Theoretical framework

Information culture in terms of approaches to information use

The influential study by Marchand and colleagues (2001) surveyed managers from 25 different industries in 22 countries. The aim of the study was to illuminate how the interactions between people, information and technology affect business performance. One central finding was the importance of people's "information behaviors and values capability", which in this paper is referred to as *approaches to information use* to avoid conceptual confusion due to differing definitions of the term information behaviour in the work of Marchand and colleagues and information studies in general. In the Marchand and colleagues' study these approaches were found to include six interrelated dimensions that enhance effective information use: information integrity, formality, control, transparency, sharing and proactiveness. Each dimension is dependent on the previous one where information integrity is regarded as a basic requirement for the other dimensions. Information integrity is defined as "the use of information in a trustful and principled manner" and includes seeking and sharing accurate information and exercising good judgement. Information formality is related to "the willingness to use and trust institutionalised information over informal sources" to ensure efficient and consistent services. Formal information is information that is grounded on procedures and rules in the organisation. Information control refers to "the extent to which information about performance is continuously presented to people to manage and monitor their performance". Information transparency involves "openness in reporting and presentation of information on errors, failures, and mistakes" enabling learning and fostering change and innovation. Information sharing is defined as "the willingness to provide others with information in an appropriate and collaborative fashion" within teams and across departments. This is another conceptual anomaly, since this definition of information sharing is narrower than is normally used in information studies (cf. Pilerot, 2012), implying merely the transfer of information within a network. The most effective information use is described as information proactiveness that includes "the active concern to think about how to use information, obtain new information, and the desire to put useful information into action" to respond to changes and improve services. (Marchand et al., 2001, pp. 121-126).

The six approaches to information use have later been widely applied and validated by several empirical studies (e.g. Abrahamson and Goodman-Delahunty, 2013; Choo et al., 2008; Choo et al., 2006; Detlor et al., 2006). These studies identified a strong influence of approaches to information use, which gave rise to various outcomes of the use of information in the different

organisations. However, approaches to information use appear to be dependent on the type of business. For the policing organisations, approaches related to information proactiveness were found to be the most important kinds of approaches due to the need to keep abreast of changes in society and find solutions to new challenges (Abrahamson and Goodman-Delahunty, 2013). Informal information use was significant to the law firm, probably because of the importance of personal networks in the legal profession (Choo et al., 2006; Choo et al., 2008), while recorded information, transparency, formal information sharing internally and externally were essential to the health research organisation, possibly due to their scientific approach and a mandate to disseminate research findings (Choo et al., 2008). Detlor and colleagues (2006) conclude that the approaches to information use in an organisation have a significant influence on the employees' information related activities.

Newcomers, information practices and change

Healthcare organisations are subject to considerable and frequent change (Curry and Moore, 2003). Working as a professional in a modern healthcare organisation involves dealing with evidence-based procedures, standardised tools and information technology. The overwhelming accessibility of information puts pressure on professionals to keep up-to-date with new developments. Patients expect the best available treatment and challenge the professional authority with their active participation; the abundance of information has transformed them from passive receivers of care to informed partners in the provision of care. Information about potential diagnoses and treatment may be mutually shared between the professionals and their patients (Känsäkoski, 2017; Hult et al., 2016). Such changes in the healthcare domain challenge existing information practices and push towards greater organisational responsiveness for change and innovation (Curry and Moore, 2003).

Generally, social practices refer to repeated activities that are reproduced in their contexts, thus they have been considered as relatively stable phenomena. Giddens (1984) characterises practices as a mutually repeating duality between social structures and human agency. However, he emphasises that the social structures include rules and resources that can be changed when humans reproduce them differently in their activities. Related ideas have been presented in several influential publications (e.g. Schatzki, 2002; Shove et al., 2012; Wenger, 1998). Doings, sayings, understandings, rules and teleoaffective structures frequently change by processes that Schatzki refers to as 'reorganisation' and 'recomposition'. Changes can happen in response to different occurrences and can involve borrowing elements or taking inspiration from other practices (Schatzki, 2002). Practices change and travel between different contexts due to changes in materials, competencies and meanings from which the practices are performed. Materials include objects, tools, technology, bodies and other physical entities. Competencies represent skills, know-how, understandings and techniques, and meanings including mental activities like emotions, motivation, beliefs, purposes and ideas (Shove et al., 2012). Competencies also involve experience, and members of a community bring their personal experiences into any practice in which they participate. This may challenge and possibly change the socially defined competence of the community (cf. Wenger, 1998).

Previous empirical research in information studies on newcomers and information practices emphasises the importance of on-site learning at work. The movement from periphery to full participation is described as the movement from being able to *act* as a professional to *becoming* a professional. People are learning to *act* through textual, procedure-based information in preparatory training, however, they are dependent on embodied inter-

subjective learning in context to *become* a professional (Lloyd, 2009; Moring, 2011; Lloyd and Somerville, 2006). The move from preparatory training to the workplace "necessitates a move away from epistemic knowledge towards a greater emphasis on social and physical information as a source of reflection and reflexivity" (Lloyd, 2009, p. 417). Nevertheless, Känsäkoski and Huotari (2016) found that health professionals are preoccupied with biomedical, scientific information. Furthermore, the professionals are keen to share this information within their professional group or team, but the organisational culture may hinder information sharing across professional groups and organisational units.

Newcomers to an organisation have been given more attention in educational research and research related to organisational socialisation. The findings in some of these empirical studies are related to the present case study. Newcomers who take a proactive role to seek information acquire a better ability to perform their tasks and integrate well into the organisation having easier access to the community (Morrison, 1993; Paré and Le Maistre, 2006). Paré and Le Maistre (2006, p. 378) found that newcomers who "take chances, dare to fail, set their own goals, [and] ask hard questions" have a better experience of workplace learning than others. Additionally, challenging the existing practice stimulates and changes the community as the habitual practice will be reconsidered and may even be revised. Thus, proactive newcomers may lead to mutual transformation of both newcomers and community (Paré and Le Maistre, 2006).

The relation between the above concepts may be summarised as an open system of three different levels: organisational, professional and individual (see Figure 1).

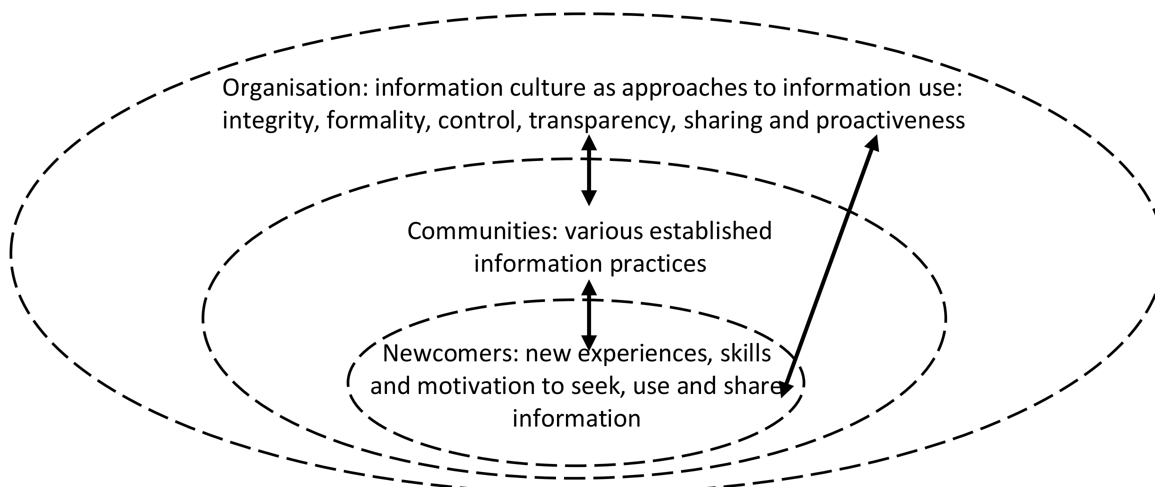

Figure 1: The dynamic relation between newcomers and new ways of seeking, using and sharing information, exisiting information practices in communities and organisational information culture

Methods

An ethnographically inspired study was conducted in a two-year workplace-training programme for newly qualified nurses in a large community hospital in Norway between 2014 and 2017. Twelve nurses were recruited in 2014 and six more nurses in 2015; in total 15 women and three men aged between 24 and 48. The purpose of the programme was to train these new recruits to be confident, flexible and capable to work on different wards. Thus, the nurses in the programme were assigned to surgical, medical and psychiatric wards with an

eight-month period in each. They got no more training or supervision than other new nurses on the wards; however, unlike most of their colleagues, they worked on a full-time basis. The significant difference was the monthly simulation exercises and lectures given by dedicated specialist nurses and other experts. The simulation exercises took place in the hospital's fully equipped simulation centre and included procedures like advanced cardiac pulmonary resuscitation, intubation and insertion of various catheters. Furthermore, they received training in non-technical skills like documentation, ethical reflection, efficient teamwork and the use of assessment and communication tools. Some of these exercises included video-assisted feedback to allow for reflection-on-action. The lectures covered subjects like infection control, handling critically ill patients and so on. Moreover, every monthly session had allocated time for participants to share experiences.

Data collection

The data collection was done through focus groups and observation in the training progamme. The first series of focus groups was conducted in the first week of the programme. By that time, most of the newcomers had worked a few weeks during the summer. The second series was conducted ten months later, midway in the programme, and the third series took place at the end of the programme, around twenty months after the start. There were six nurses in each focus group; two groups of nurses recruited in 2014 and one recruited in 2015. A semi-structured interview guide was e-mailed to all the participants one week before each focus group meeting.

The first series of data collection involved questions concerning how the nurses use different information sources to cope with the transition between the education environment and their workplace. Preliminary data analysis was undertaken during both data collection and transcription by making notes about possible codes and themes (cf. Grbich, 2013). One of the main themes that appeared was handling conflicting information from different information modalities, reported in Nordsteien (2017), and this theme was further elaborated in the second focus group series. Another interesting theme that emerged in this round was cultural aspects concerning information use, and thus the third series raised questions about these cultural aspects and development of practices. All focus groups were conducted in Norwegian, audiotaped, transcribed verbatim and imported into NVivo11.

Observation involved participating in all of the monthly exercises and lectures in the programme, as well as during evaluation meetings with the hospital ward management and the simulation centre, and three midway follow-up conversations between the project manager and individual nurses in the training programme. Additionally, one of the nurses was shadowed at a shift on her ward. The findings are for the most part based on the analysis of the focus group discussions, and observation data will not be presented in this paper. However, these observations have been valuable to capture what is going on in the workplace and in the training programme, and thus to be able to introduce relevant themes to discuss in the focus groups.

Written informed consent was obtained from all the participants and a representative of the hospital management. Names of the participants, hospital and wards were removed in the transcriptions. The participants were given codes from N1 to N25. The Norwegian Social Science Data Services approved the study in June 2014 (project no. 39107).

Data analysis

Thematic analysis was conducted and assisted by using the programme NVivo11 inspired by Bazeley (2013). The first step was to identify and take notes about emerging topics and possible codes arising during the processes of the focus group discussions and observations. This involved listening through the recordings, transcribing and analysing the transcripts. Based on the two first focus group series and first year observations, the most prominent codes that emerged were trust, distrust, integrity, frustration, resistance, sanctions, support, negotiation, change, interprofessional relations, management and theory-driven codes like epistemic, social and bodily information. Code descriptions were made for each code in NVivo11 to improve the consistency of applying codes, and notes were written about thoughts of relationships between the codes and possible patterns in the data. The second step was to develop an initial thematic framework. The structured coding system of Bazeley (2013, p. 182) was used as a guide to generate categories. The most prominent categories were information needs, information strategies, information outcome and organisational culture. The third step was the application of the analytical framework on all the material; that meant assigning text passages to the defined nodes in NVivo11. The coding of data material was reviewed to double check the consistency of coding, which resulted in reapplying a small number of the codes. The data was summarised and displayed in a longitudinal matrix to illuminate the newcomers' change in experience over the three focus group series. This made it possible to identify relationships and patterns in the data.

One of the recurrent themes was organisational culture in relation to information seeking, sharing and use. A literature search for a relevant analytical framework led to the approaches to information use of Marchand and colleagues (2001), which seemed to be applicable to this theme. The material was recategorised into the six approaches to information use, and these guide the presentation of the findings in this paper.

Findings

The six approaches to information use identified by Marchand et al. (2001) are: information integrity, formality, control, transparency, sharing and proactiveness. As these are at times interdependent, there will be some overlap in the presentation of the six approaches through research data. The findings demonstrate how the newcomers experience aspects of these approaches and of the information practices on their respective wards, as well as how they respond. Changes in the new nurses' experiences expressed during the three focus group series are specifically highlighted.

Information integrity: 'I can't justify doing it that way'

As earlier defined, information integrity includes seeking, sharing and using accurate information in a trustful and principled manner. Integrity points to ethical boundaries for all information related activities, and directly influences information formality. This is illustrated by the following quotes from the interviews. For example, the procedure manual that contains updated and approved research-based information on how to perform various tasks is considered the most reliable and accurate information source. The general approach in the hospital seems to be: to find the relevant procedure, share it with the colleagues and act according to it. Many quotes relate to this:

> There is a strong focus on the procedure manual. (N3, 1st series)

> They are using the procedures, although they have been working there for many years. (N2, 1st series)

> On my ward, they use the procedures; printing them out and adding them to the patient records when it is important. (N22, 1st series)

These experiences from the first focus group series were less nuanced than those expressed in the last two series. In the last two series of interviews several practices were identified as co-existing on the wards. The newcomers noticed that the information they received from colleagues about how to do various patient-related tasks was sometimes inaccurate:

> You notice that when you ask about procedures, you often get an incorrect answer. (N4, 3rd series)

> Since I experienced that it [the information requested] was completely wrong, I no longer trust my colleagues 100 percent. (N1, 2nd series)

Sometimes the newcomers observe that some colleagues are consciously not acting according to the procedure manual, adapting the procedures as it suits them or having “bad routines”. The newcomers have different strategies to deal with such situations and they meet different responses when they make their colleagues aware of incorrect performance. The quote below summarises most of these issues well:

> I don’t feel confident enough to speak up in all cases, but sometimes if I notify the person in a pleasant way or tell them that ‘I’ve read this and that and why do you do it this way?’ Then I get a lot of different responses. Some say that they don’t have the time, actually, this is often the response; they don’t have the time to do it the way they’ve learnt it! Sometimes they just say ‘that’s how I’ve learnt to do it’ and they are not able to do it differently. And others say ‘read the procedures, do it the way you’ve learned, it is probably right’. And some just get annoyed. The response depends very much on the individual. (N22, 1st series)

In the first focus group series, the newcomers emphasised very clearly that they wanted to do what is justifiable and right. They stressed the importance of patient safety, and they wanted to be considered skilled professionals:

> I want to do it the way I know is right, so I can feel satisfied and confident with what I’m doing, and not just do it the way all the others on the ward do with their bad habits. (N3, 1st series)

> You should maintain your good habits, although other nurses might tell you not to do it that way, because they’re not used to it. This is the way I do it, because I know it’s justifiable and right. (N3, 1st series)

> Even though the other nurses do it that way, I’ll not, I can’t justify doing it that way, because I want to be considered a skilled professional. (N2, 1st series)

In the first two series, some of the newcomers expressed frustration about being a newcomer and not confident enough to speak out about situations that might cause harm to the patients. As one nurse expressed "it's difficult, I felt I had good control of the situation, but being new on the ward, I wasn't tough enough to say so directly" (N20, 2nd series). However, at the end of the training period they felt more confident. They explained that it was easier to justify their choices, because they felt more certain about their identity and ambitions:

> I feel like quite a conscientious nurse, making decisions on the basis of assessment instead of just following the crowd. (N3, 3rd series)

> It's about finding how I want to behave as a nurse, how I want to perform, how I want to plan my day. I have to comply with the laws and rules on the wards, but I don't have to do the same as the others. If I think it's not the optimal way to perform, I don't have to do it, because I can justify why I do things differently. Two years ago, I didn't dare to do this. (N2, 3rd series)

Even though information integrity seemed to be a dominating cultural trait amongst health professionals in the hospital, there were varying practices on different wards and between colleagues. The participants described that their colleagues on ward did not always practice as they expounded. However, the newcomers as a group demonstrated integrity towards information use and seemed to preserve and enforce this approach into the information practices they met throughout the two first years in the hospital.

Information formality: 'We should consult the correct sources'

Information formality refers to the willingness to use and trust institutionalised information over informal sources. Providing information integrity in the form of accurate and trustworthy institutionalised information, people are likely to trust and use formal information (cf. Marchand et al., 2001). In this case study, the most important institutionalised information is the procedure manual, as documented above. Other extensively used formal information include the patient records, various assessment tools and handbooks concerning drug information, diagnoses, medical terms and legislation. Additionally, all employees are encouraged by the management to read information on the Intranet, newsletters, e-mails and conducting e-learning courses to keep themselves up-to-date on new information:

> N23: It's really great that the newest procedures and changes are written in a newsletter.
> N25: Yes, we got them [new procedures] on e-mail, and then we are notified. It's nice. (3rd series)

Staff are also encouraged to use national guidelines: "On the ward, I was told to read the national guidelines on these diagnoses" (N10, 1st series). National procedures and other scientific information are also emphasised in cases where the necessary information is not provided by the hospital information systems. However, information provided by the hospital has primacy. This is demonstrated by the following quotes:

> I experience that many more people use the hospital procedure manual [than the national procedures] if the information is found there. (N5, 1st series)

> You may risk a national procedure not being approved for use in this hospital. (N2, 1st series)

> The procedure manual is the main thing for this hospital. Someone has assessed this information and decided that we shall do this because… and there are also references. (N2, 1st series)

This last quote indicates the importance of the procedures being grounded on scientific information. This trend seems to affect the information practices in the hospital, since searching, using and sharing scientific information seem to be relatively common:

> On the ward where I am now, they are very concerned about research. I feel research is much more easily available now. People working there often say: 'this research shows...' and 'yesterday, I read this'. So, they are quite up-to-date and this [research publications] is readily available to me as a newcomer, if there is anything I'm wondering about. There is so much information that is easily available to us, so you don't always have to do literature searches, but if it's something you're engaged in, you'll automatically go and do a search. (N22, 1st series)

Formal information is often complemented by informal information and vice versa as this exchange demonstrates:

> N4: I often ask colleagues, but when it comes to procedures I don't know, I always double-check the procedure manual, because there may be changes people don't know about.
> N1: It's fine to both read the procedure, and ask colleagues, but maybe reassure oneself with the procedure.
> N4: And it's easier to understand the procedures with comments from colleagues if you are not sure about something. (2nd series)

Thus, they read the procedures in cases when they are not sure what to do or when they face a new task, preferably in combination with watching a video or observing a colleague performing the task:

> There was also a video, and I watched this before I conducted the task and that made it easier to understand. Another time when I didn't understand a procedure and I couldn't visualise it, I asked a colleague to demonstrate. (N20, 1st series)

These findings indicate that formal information is preferred, although in combination with informal information. The challenge is to stay up-to-date, because the procedures are frequently changed based on the latest scientific information: "New things happen all the time, you never get to know everything, there are new guidelines and new treatment methods, and these are updated all the time" (N2, 3rd series). Consequently, the newcomers consult the procedure manual regularly: "With respect to procedures, I don't think I'm using them less, I think I have used them as extensively all the time; from when I started until now, because there is always something new" (N3, 2nd series). This approach remained dominant in the third focus group series. As time progressed, the newcomers felt more confident and promoted the procedures and even taught their colleagues where to find formal and correct information:

> It's about raising awareness of what's out there: keys, utilities and resources. When you know these, you become more independent in making decisions and... more confident, I believe. (N2, 3rd series)

> If people wonder about something, we should learn about it together. We should consult the correct sources and make others to do the same. (N3, 3rd series)

> They all panicked and I just said 'there is a procedure here, just follow it' and then it was easy, because I knew about it and had experience of it on several occasions, so I was confident about it. It was fine. (N25, 3rd series)

The newcomers characterise the procedure manual as a safe, easy and efficient information source to base their performance on. The willingness to base performance on formal information complies with an idea that the services in an organisation should be consistent.

Information control and transparency: 'I reported an error I made, that way I never forget it'

Information control and transparency are intertwined themes in the data material, thus, they will be presented together in this analysis. Information control refers to information presented to employees to manage and monitor their performance. Information transparency includes openness in reporting errors, failures and mistakes, which were the main discussion theme during the focus groups relating to these two approaches. The relation between transparency and control also touches on information formality and integrity, since errors and failures are often categorised as violation of procedures or other formal information in the organisation. In turn information control establishes a format for how such errors can be managed amongst employees. In this way the approaches to information control, transparency and formality are strongly connected to organisational learning. There seems to be a large focus in the hospital on reporting errors, and newcomers are encouraged by management and colleagues to do it: "We're often reminded to 'report errors, it's important!' it's repeated frequently" (N20, 3rd series). A mandatory e-learning course provides information on when to report errors and how to use the electronic error reporting system. Most of the newcomers report errors they themselves have made, while some report even errors by others as this exchange demonstrates:

> N25: When I report errors, they're errors I have made, but when I see something others have done, then I don't report it.
> N20: It depends on the case. I have done it due to the severity of the error. (3rd series)

Thus, there are different motivations for reporting errors. The severity of the incident is important as indicated above. For example, cases with patient injuries have to be acted upon. Moreover, the newcomers say that they want to "learn from the mistakes" (N24, 3rd series). Another nurse emphasised this point: "I reported an error I made, that way I never forget it!" (N21, 2nd series). An additional motivation for reporting errors was to highlight the consequences of having too few personnel on duty:

> It was a severe incident, when we had so much to do that we weren't able to help a patient with the morning care routines until dinner time, when she was going to bed again. This is a case I want feedback on. (N24, 3rd series)

This quote also indicates the importance of feedback. However, the newcomers reported that they seldom got feedback on the error reports, thus, they felt that they were wasting time reporting the errors: "I feel that it [reporting] is of no use" (N25, 3rd series). Another nurse

commented that feedback via e-mail including something like "actions taken" would have been proper and "then I would have reported even more errors" (N20, 3rd series). Furthermore, the newcomers observed that their colleagues, who have been working on the wards for a long time, reported fewer errors, because no improvements followed.

Similarly, feedback on work performance was repeatedly missed:

> I'm looking forward to getting some kind of structure and follow-up being new on my ward, because I feel there was no such thing on the other two wards. So I'm looking forward to get some attention and feedback to ensure that I will reach the proper level (N20, 3rd series).
>
> N25: I feel that people… and me too, are good at telling if I do something wrong and not so good at telling if I don't do something bad. If I don't hear anything, I think everything is fine.
> N24: Yes, I also think so.
> N21: I think that the culture is not to brag, but we *should* brag about some colleagues sometimes, then they will brag about you, and that's good for the work environment, that you encourage such a culture. (3rd series)

Despite little response, some of the newcomers kept promoting the reporting of errors: "I've told many people that the only way to show you have too much to do is to report it. But, they never do" (N25, 3rd series). They also kept promoting a culture that created a safe, open and pleasant atmosphere. The newcomers seemed to want to contribute to a culture that was tolerant both of reporting errors and mistakes as well as discussing their work practices and work performance:

> I think that it's very important that you are acknowledged when reporting errors. We should try to establish a culture where it's okay for people to report errors. (Nurse 21, 1st series)
>
> They [experienced colleagues] have to be more open to questions about why they act differently. It should be allowed to ask why they do as they do, maybe I'm doing something wrong". (N8, 1st series)
>
> We have to ask for feedback. I wasn't good at that on my first ward. Eventually, I understood that I benefit from getting some feedback and talking with people about my performance. Now I've become better at asking for it. (N21, 3rd series)

These two approaches were mainly brought up as themes in the last focus group series, however, as the last quote demonstrates, some experienced how beneficial it is to get feedback and they probably became more confident asking for feedback in the second year. Some of these quotes express that the newcomers wanted to contribute to a change in culture in terms of error reporting as well as creating space for positive feedback and a more open work environment.

Information sharing: 'everyone is open to sharing information with others'

Information sharing here refers to providing formal and informal information within the team, across departments and to external partners. The relation to information integrity is to share or ask for accurate information, which often involves formal information. Sharing information may in part involve being transparent with errors and giving feedback on performance. The newcomers describe the workplace culture as characterised by continuous and mutual information sharing between newcomers and experienced colleagues as is illustrated in the following exchanges:

> Like you say, you can ask everybody about whatever you need to know, whenever you like and then everything is fine. Everybody is clear that you are allowed to be new, and that's a moral response shared by everybody on the ward. Then it's actually nice to be new. (N21, 1st series)

> Also when I get a question I don't know the answer to, I like to motivate 'come, we should go and ask, then I will learn it too'. (N20, 3rd series)

There is an expectation that newcomers ask colleagues for help as "they think it's stranger if you don't ask" (N22, 1st series). However, learning goes both ways, because information is mutually shared, and the newcomers are acknowledged for the knowledge they possess:

> Some of my colleagues haven't dealt with these procedures for 20 years. So, they asked me to take care of these patients, but then I said that they should observe what I do and that I will teach them how to do it, so they will be able to handle it themselves next time. And that's been much appreciated on the ward, and I am very happy about the fact that, I, being newly graduated and not knowing so much, am able to teach my colleagues something, and that they respond positively to updating their skills. (N21, 1st series)

> I think we are more aware of the differences, since we have been working on three wards, we adapt better and see more opportunities than problems and make suggestions about what might work best. (N7, 3rd series)

The newcomers point out that there also is a culture of information sharing between nurses and physicians, and that this relation has become more equal resulting in an improvement of communication between the professions:

> Physicians… sharing knowledge has improved, the hierarchy that existed a few years ago is disappearing. Now it's okay to go and talk with them: 'Hi, now I'm going to do something I haven't done for a long time, what's the latest approach in this field?' It's okay to talk with the senior physician and other colleagues, and everyone is open to sharing information with others in a completely different way. (N21, 1st series)

Obviously, the nurses and physicians have to share patient information daily. However, the nurses' awareness of research has increased during the past years and the physicians are aware of that. This may have contributed to more equality between the professions as reported above, and the quotes below illustrate this further:

> I asked a physician a question and he said 'No, I actually don't know that, but let's do a

> search, please sit down'. And then he accessed the research database. (N23, 2nd series)
>
> I've experienced only one big change in a procedure. The physician presented it and justified it based on research and practice at other hospitals in Norway and abroad. (N20, 3rd series)

The newcomers reported that they are experiencing a new culture in the hospital as physicians and nurses often share research findings in discussions with both colleagues and patients. This is an example of patient information sharing:

> Several physicians shared research information with the patient. Often if they were going to have some kind of treatment, they said 'research shows that…'. I think it was so good, then the patient sits there knowing that the physician actually knows what's new, and that's so positive, because then I'm learning something new and the patient gets to know that the physician is keeping up-to-date. (N20, 2nd series)

The newcomers claim that when new situations arise on a ward, it is chaos and difficult to decide what to do. However, the newcomers explain that in such cases they have strategies for obtaining necessary information through formal sources and by consulting the hospital's resource staff on other wards. The newcomers reported that it is not common among the nurses to seek information across the wards, but they are able to do so since they know about several information resources in the hospital, having been themselves on different wards:

> N21: If I go to another ward and ask 'I have a problem, could you quickly show me?' That's no problem, people are very helpful.
> N24: Because you know the hospital better due to working 100 percent and having been on different wards so you get to know people, this makes it easier to ask.
> N21: Yes, because we know where to go to find the answers.
> N25: Many people don't dare to do that. (3rd series)

There was a change in the way the newcomers considered their contributions to sharing new information over the three focus group series. In the first series, they emphasised their ability to share "up-to-date professional and scientific information" with their new community. In the second series, they focused on having a "bridge-building role between the wards, attempting to justify, implement and teach" new information (recapped by N10 in 3rd series). As highlighted above, in the third series the newcomers felt very confident about information seeking in the hospital and attempted to share information with their colleagues about what information resources to seek across the hospital.

Information proactiveness: 'There will always be changes'

Information proactiveness involves a concern about how to use information, how to obtain new information and how to put useful information into action as response to changes, thus getting involved in managing innovation. Proactiveness is an approach, which combines the above five approaches. This means that proactiveness implies the use of accurate, formal information, to give feedback to people, being open about errors and finally sharing all this information across the organisation. A proactive approach improves organisational responsiveness to change and innovation in the healthcare domain. There were various experiences relating to proactiveness on the different wards. Some participants had very positive experiences as in this example:

> They are very good at professional development everywhere. I think, having lunchtime lectures and focusing more on that than they maybe did before. In this way it's possible to take part in the development processes. Professional development is very important. On my ward, even the physician was interested in the lunchtime lectures. (N2, 3rd series)

Another said that "The procedures we should use, have to be based on the latest information, and on my ward, they changed one of the procedures based on how other hospitals around the world do it and research findings" (N20, 2nd series).

Despite a lot of enthusiasm, several of the newcomers also reported certain negative attitudes towards new things as is highlighted in this example:

> I really noticed on my ward that there was considerable negativity regarding new procedures. As recent graduates, we are not used to how things were done before, it is all completely new to us, and then it's easier for us to introduce it [a new procedure] or to do something. We have to promote it in a positive way and make them understand that it isn't really a big change, and that we should do it to prevent any harm to our patients. (N4, 2nd series)

The newcomers used various strategies to try to influence the culture on their wards, in this case the argument was the patients' well-being. Another newcomer emphasised that "you encourage change by linking it to something positive" (N10, 2nd series) and a third one said that "You can change one person at a time. Maybe try to change the most responsive colleagues' attitudes at least" (N9, 3rd series). Another comment was that: "We don't have to change things immediately, but rather show them how they do it in other places and make them reflect on opportunities and alternative solutions" (N4, 3rd series). Moreover, the newcomers share information and are teaching their colleagues how to use new procedures and tools as previously documented.

The newcomers mention different strategies for keeping themselves abreast of new knowledge. As one nurse explained:

> Now I'm recently qualified, and it's time to ask questions. And, like you say, seek out learning opportunities. I will expose myself to situations. But you can't just ask about everything, I will also check the procedures. (N5, 1st series)

Some of the newcomers were concerned about using literature searching for skills from their education to update themselves:

> If you want new information, new knowledge, then you have a lot of experience from your training about knowing where to find it. (N8, 1st series)
>
> Having knowledge about critical appraisal, how to find research and being critical of it. I think those two things in the education are very important and really fun, because you know that you can find an answer to something you are wondering about or discuss it with someone. (N23, 1st series)

The newcomers claim that they often are the first to be aware of changes and often point them out to their colleagues. However, they believe that it should be a mutual learning process:

> There is no one who knows absolutely everything 110 percent, and there will always be changes. That's what happens in this field when something new happens. There is a new reform, or new legislation or a new procedure or something. Eventually, everything will be up-dated, and I think it is important to use and help each other to do our best. (N2, 1st series)

These examples show that in the first series the newcomers were very concerned about how to acquire information to handle their daily work, and they seemed to be somewhat optimistic about the opportunities they would get to do literature searches and be part of different situations on their wards. In the last series, they had experienced different challenges and approaches, and they were very concerned about how to change the information practices and approaches to information use on their wards.

Discussion

The aim of the current study was to investigate how a group of newcomers in a healthcare organisation experience and interact with professional information practices and organisational information culture, and how this interaction can lead to mutual transformation of newcomers as well as information practices and organisational culture. The findings reveal some contradictions in the newcomers' experiences about the approaches to information use in the hospital. The newcomers characterised the hospital information culture as preoccupied with the use of accurate formal and scientific information in line with Känsäkoski and Huotari (2016). Employees are encouraged by the management to be open about errors, to continuously share information between different actors and to be constantly involved with professional development. However, these statements that relate to information culture appear at times to be dislocated from what is said and done in practice according to the newcomers. Additionally, several different information practices seem to co-exist. The research data revealed a number of contradictions. Some nurses act in a different way to what they promote verbally and/or what is prescribed by formal information. Feedback on performance seems to be missing, which leads to less error reporting. Sometimes information shared by colleagues is inaccurate, and occasionally there is resistance to both changes and new information. In terms of Marchand and colleagues (2001), these challenges relate to different approaches to information use, starting with the information integrity as the basic dimension. In the present case, approaches concerning information control and transparency appear as particularly central to improving information proactiveness in the hospital. Proactive information culture is particularly important in the context of healthcare due to the continuous changes and innovations (cf. Curry and Moore, 2003).

Previous quantitative studies have provided information about what approaches to information use dominated in relation to a set of predefined information use outcomes in different kinds of organisations, but the studies have not been able to establish *why* various approaches were stronger than others (cf. Abrahamson and Goodman-Delahunty, 2013; Choo et al., 2008; Choo et al., 2006; Detlor et al., 2006). The framework of Marchand and colleagues (2001) seems to be fruitful in a case study like the current one in order to provide concrete information about needs for improvements to be able to face challenges and changes in the organisation. Additionally, new trends may be identified such as the use of scientific information and other epistemic information that seem to have gained a foothold in nursing practices. This is a new development from practices reported in previous research (e.g.

Johannisson and Sundin, 2007; Lloyd, 2009). Scientific information is commonly shared even with patients, as noted in some research (e.g. Hult et al., 2016). Despite the increasing value given to epistemic information in nursing practice, social and physical information are still essential in these professional practices (e.g. Lloyd, 2009; Lloyd and Somerville, 2006). However, development may entail a tighter integration between epistemic and social information. As the findings here indicate, there is a concern to share accurate formal information supplemented by observations, instruction videos and discussions with colleagues. A shared conviction seems to exist that finding, using and dissemination of reliable information ensures patients' well-being and safety. The common orientation towards scientific information may even have contributed to the increased equality between the health professions.

In line with previous research, the newcomers are renegotiating and passing on new knowledge to the community (e.g. Billett, 2014; Fuller et al., 2005; Hodkinson et al., 2004; Wenger 1998). The newcomers transfer knowledge from other contexts to the workplace, mainly from their educational background, but also from their different work experiences. They defend the use of formal information rather than moving away from it. This contradicts the findings by Lloyd (2009). Individual agency seems to be a prominent factor in the present findings (cf. Billett, 2014; Giddens, 1984); there are aspects of motivation, personality and integrity, which challenge the practices at the hospital. The newcomers take a proactive approach to seek and share information, to integrate it into the community (cf. Morrison, 1993; Paré and Le Maistre, 2006). The exchange of information seems to be a two-way process, which enables mutual learning in the workplace and increasingly equal relations between newcomers and experienced professionals. Moreover, the findings indicate an ongoing open negotiation between the organisational information culture, or at least its goals, and the professional information practices. The role of information is discussed on several occasions, which in itself is an aspect of a proactively oriented information culture.

Apart from proactive information culture, proactive newcomers may also influence practices, causing them to be reconsidered or revised (Paré and Le Maistre, 2006). Newcomers transfer information practices from the educational context, which may lead to 'recomposition' of information practices at the workplace (cf. Schatzki, 2002) or a change in 'rules' or use of resources (cf. Giddens, 1984) when accommodating an information need. The newcomers' personal experiences challenge the socially defined competence of the community (cf. Wenger, 1998). According to Shove and colleagues (2012), practices change due to changes in materials, competencies and meanings. In this case, the newcomers bring new competencies in the form of research skills and 'know-how': they are able to seek, use and share scientific information. They bring new meanings in the form of motivation and integrity to use and share formal, scientific information, and this is justified by a strong, shared goal for the profession, of the patients' well-being. The material aspect may include information technology such as the availability of research databases and other information systems and tools. However, as indicated in the findings, there is also resistence to these changes for different reasons. Implementation of new ways of working may be stressful. Some nurses may hesitate in some situations, because of the risk of misconduct due to not being up-to-date. Moreover, always conferring with procedures may appear an inefficient way of working compared to acting on experience. Finally, patients are different, and acting according to the best knowledge may not always lead to the optimal outcome for the specific patient.

Methodological limitations

This study provides a relatively limited view of information culture in one organisation. Only one aspect of information culture is examined: that of approaches to information use. These approaches are experienced by new nurses on a few different wards in only one hospital. Additionally, information culture differs between the wards and over time. Even if the interview material about new nurses' experiences are supplemented by observations, these were mainly made within the training programme and not during the daily practice on different wards, and other perspectives are missing. The findings cannot be considered representative for nursing practice in general, because the context is a specific training programme in a country with relatively equal relations within and between professions. Moreover, the nurses involved in the study are participating in an elite initiative within the hospital and this is likely to affect both their self-esteem and how they are regarded by others.

Conclusion

This work sheds new light on newcomers' information use, as they integrate into a workplace and interact with information practices and organisational approaches to information use. Perhaps the most significant contributions are the development of newcomers' perspectives over time and the identification of the dynamics between the three agencies; individual agency in the form of the newcomers, social agency in the form of the existing information practices and organisational agency in the form of the information culture. The dynamics and mechanisms that are at work are merely outlined in the present paper, but at the same time there is clear evidence of the interdependencies. This highlights that an understanding of the role of information in workplaces remains always limited when only one agency is focused on in research of material and intellectual instances of information use. These findings call for further more longitudinal and holistic empirical and theoretical research in the field of workplace information. This research indicates that there is a need in information studies to develop models and theories that explicitly measure both individual and social agency.

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