Attractive Work

Nurses’ work in operating departments, and factors that make it attractive

CATRINE BJÖRN
Abstract

**Background:** Previous studies show that nurse retention is one of the most effective strategies to counteract nursing shortages. Few studies have focused on the crucial resource of registered specialist nurses in operating departments.

**Aim:** The overall aim of this thesis was to gain knowledge on registered specialist nurses’ and assistant nurses’ work in operating departments and on what factors they consider to be important for attractive work.

**Methods:** In Study I, operating room nurses were interviewed regarding their perspective on their work. In Studies II and III, specialist registered nurses and assistant nurses at operating departments in a Swedish county council responded to the Attractive Work Questionnaire. Study IV is a case study with interviews, a review of organisational goal documents and data concerning the number of planned, acute and cancelled operations.

**Findings:** The adaption of the Attractive Work Questionnaire for nurses in operating departments was satisfying. The most important factors for attractive work were: Relationship, Leadership and Status. The factors with the largest discrepancies between their important to work attractiveness and their rating at the nurses’ current work were: Salary, Organisation and Physical Work Environment. It was important for nurses to be able to prepare for and be in control of the different work tasks. However, the daily operating schedule guided the nurses’ work, and changes in the schedule, nurse shortages and the design of the premises constituted obstacles to their work.

**Conclusion:** The Attractive Work Questionnaire provided specific information to management on what to focus on to make work attractive. The majority of the identified attractive factors are already known to be of importance in nurse retention; however, factors requiring more investigation are Equipment, Physical Work Environment and Location (of the workplace). Their work prerequisites did not enable the specialist and assistant nurses to reach what they saw as their daily goals. Regularly occurring activities, such as acute and cancelled operations, were interpreted as obstacles to reaching daily goals.

**Keywords:** attractive work, nursing workforce, personnel turnover, job satisfaction, nurse retention, nurse shortage, operating room

*Catrine Björn, Department of Public Health and Caring Sciences, Caring Sciences, Box 564, Uppsala University, SE-751 22 Uppsala, Sweden.*

© Catrine Björn 2016
To my family,
Percy, Albin, Beatrice & Cornelia

"Utan tvivel är man inte klok"
Tage Daniesson
Tankar från roten, (1 uppl. 1974)
List of Papers

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


III Björn, C., Lindberg, M., Rissén, D. Significant factors for work attractiveness and how these differ from the current work situation among operating department nurses. *Journal of Clinical Nursing*. doi: 10.1111/jocn.13003


Reprints were made with permission from the respective publishers.
Front cover photograph, Specialist nurses’ and assistant nurses’ during an education lecture at an operating department. Photo by Anders Larsson, 2015.

Back cover photograph, the author. Photo by Inga-Lill Stenlund 2012.
## Contents

- Prologue ............................................................................................................................................... 9
- Introduction .......................................................................................................................................... 11
  - Operating departments .................................................................................................................. 12
    - Work in operating departments .................................................................................................. 12
    - The physical work environment in operating departments .................................................... 12
    - Nurses’ work in operating departments .................................................................................... 13
  - ‘Nursing shortage’ and related expressions’ .................................................................................. 15
  - ‘Nurse retention’ .......................................................................................................................... 15
- The Attractive Work Model .............................................................................................................. 16
  - Areas in the Attractive Work Model and how they relate to research on nurse retention ............ 17
- Additional concepts used in research on nurse retention ............................................................... 19
  - Work engagement ....................................................................................................................... 19
  - Work ability ................................................................................................................................. 19
  - Self-rated health .......................................................................................................................... 19
- Rationale for the present thesis ......................................................................................................... 21
- Aims .................................................................................................................................................... 23
  - Study I .......................................................................................................................................... 23
  - Study II ......................................................................................................................................... 23
  - Study III ....................................................................................................................................... 23
  - Study IV ...................................................................................................................................... 23
- Methods ............................................................................................................................................. 24
  - Study design ................................................................................................................................. 24
  - Study settings ............................................................................................................................... 25
  - Sample .......................................................................................................................................... 26
    - Study I ...................................................................................................................................... 26
    - Studies II and III ........................................................................................................................ 26
    - Study IV ................................................................................................................................... 26
  - Data collection and procedures .................................................................................................... 27
    - Study I ...................................................................................................................................... 27
    - Studies II and III ........................................................................................................................ 27
    - Study IV ................................................................................................................................... 29
  - Data analysis .................................................................................................................................. 29
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study I</td>
<td>29</td>
</tr>
<tr>
<td>Study II</td>
<td>29</td>
</tr>
<tr>
<td>Study III</td>
<td>30</td>
</tr>
<tr>
<td>Study IV</td>
<td>31</td>
</tr>
<tr>
<td>Ethical considerations</td>
<td>32</td>
</tr>
<tr>
<td>Study I</td>
<td>32</td>
</tr>
<tr>
<td>Studies II and III</td>
<td>32</td>
</tr>
<tr>
<td>Study IV</td>
<td>33</td>
</tr>
<tr>
<td>Results</td>
<td>34</td>
</tr>
<tr>
<td>Study I</td>
<td>34</td>
</tr>
<tr>
<td>Study II</td>
<td>35</td>
</tr>
<tr>
<td>Study III</td>
<td>40</td>
</tr>
<tr>
<td>Study IV</td>
<td>42</td>
</tr>
<tr>
<td>Discussion</td>
<td>44</td>
</tr>
<tr>
<td>Attractive work for nurses in operating</td>
<td>45</td>
</tr>
<tr>
<td>departments</td>
<td></td>
</tr>
<tr>
<td>Work conditions according to the Attractive</td>
<td>46</td>
</tr>
<tr>
<td>Work Model</td>
<td></td>
</tr>
<tr>
<td>Work content according to the Attractive</td>
<td>50</td>
</tr>
<tr>
<td>Work Model</td>
<td></td>
</tr>
<tr>
<td>Job satisfaction according to the Attractive</td>
<td>51</td>
</tr>
<tr>
<td>Work Model</td>
<td></td>
</tr>
<tr>
<td>Attractive work and work engagement for</td>
<td>51</td>
</tr>
<tr>
<td>nurses in operating departments</td>
<td></td>
</tr>
<tr>
<td>Methodological considerations</td>
<td>51</td>
</tr>
<tr>
<td>Methodological considerations for building</td>
<td>52</td>
</tr>
<tr>
<td>trustworthiness into qualitative Studies</td>
<td></td>
</tr>
<tr>
<td>I and IV</td>
<td></td>
</tr>
<tr>
<td>Methodological considerations in building</td>
<td>54</td>
</tr>
<tr>
<td>rigor into quantitative Studies II and III</td>
<td></td>
</tr>
<tr>
<td>Conclusions</td>
<td>58</td>
</tr>
<tr>
<td>Clinical implications</td>
<td>60</td>
</tr>
<tr>
<td>Svensk sammanfattning (Swedish summary)</td>
<td>61</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>64</td>
</tr>
<tr>
<td>References</td>
<td>68</td>
</tr>
</tbody>
</table>
Prologue

I have been working as a nurse almost all my life, and for the last fifteen years, I have worked in operating departments. Throughout the years, I’ve worked in many healthcare settings: Some were old and far from being “fancy”, and some were new and built with high-tech equipment. In some places I encountered plenty of laughter and joy, while in others I experienced a more serious tone in my conversations. From my point of view, there were no obvious outstanding positive or negative factors in the work environments or in the working conditions. However, some of the healthcare settings never suffered from nursing shortages, while others had shortages quite often. Still, when I’ve asked nurses in different workplaces how they find their work, they often respond, “Oh, I like it here”. “Why?” I say, and they answer, “Well, I don’t know, I suppose it’s something in the atmosphere”. And that’s what I want to know: What’s in the “atmosphere” that makes nurses want to stay in their work?
Introduction

Over the years, there have been problems in healthcare involving nurse shortages, both nationally and internationally. In the European Union, the nursing shortage is estimated to reach 590,000 nurses by the year 2020 (Sermeus & Bruyneel 2010). In the US, forecasts suggest that the nursing profession will experience greater growth than any other profession from 2010–2020, which is seen as a great challenge, considering the present shortage of nurses (Bureau of Labor Statistics 2012). In Sweden, the situation appears slightly more positive as there are more nurses per inhabitant than average when compared with other counties in the Organisation for Economic Co-operation and Development (OECD 2013). Still, the demand for nurses is higher than available resources in several areas, and particularly the demand for specialist nurses (The National Board of Health and Welfare 2014). In 2012, a total of 106,176 registered nurses worked in healthcare in Sweden (The National Board of Health and Welfare 2015). Recruitment estimations from 2013–2022 are 38,000 nurses, which is considered a challenge (Swedish Association of Local Authorities and Regions 2014).

Despite the well-known nursing shortage problem (Chan et al. 2013, Flinkman et al. 2010, Hayes et al. 2012) and the substantial research in this area (Aiken et al. 2012, Estryn-Behar et al. 2007, Heinen et al. 2013, Van den Heede et al. 2013) little research has focused on the crucial resource of registered specialist nurses in operating departments. Nursing shortages in operating departments are notably problematic because the registered specialist nurses, nurse anaesthetists and operating room nurses, are highly specialised and cannot be replaced by registered nurses who do not possess the required special education and experience (Gillespie & Hamlin 2009, Meeusen et al. 2010). A shortage of registered specialist nurses in operating departments may also lead to reduced operation capacity, with consequences for both the patients and the healthcare system. In order to provide an understanding of how to retain specialist nurses in operating departments, this thesis investigates nurses’ work and the factors that they consider important towards making their work attractive.
Operating departments

Work in operating departments

An operating department is often characterised by a high patient flow of both planned and acute patients, which is related to complex patient logistics. In order to handle the constant changes in patient logistics, a flexible organisation and staff are required (Gillespie et al. 2009). The work itself necessitates multidisciplinary teamwork, in which different professionals with different roles and skills participate in the work related to the patient. Not only does each team member need to be in place, but teamwork and communication need to be effective and functioning in order for an operation to be successful (Gillespie & Hamlin 2009). Although the ambition for a surgical team is a successful and safe surgery procedure with no harm to the patient, difficulties in teamwork have been observed (Flin et al. 2006, Rydenfalt et al. 2012). Poorly functioning relationships have been shown to negatively impact surgical performance (Hull et al. 2012). Difficulties in teamwork seem to be linked to differences in activity orientation between different professions in the team (Rydenfalt et al. 2012), lack of understanding and lack of shared goals for patient care between professions, and disagreements in operating schedule management (Coe & Gould 2008).

The physical work environment in operating departments

The physical work environment in operating departments has been studied to some extent. In this high-tech environment, the equipment is often noisy. High noise levels have been measured during operations involving ultrasound, although they did not pose a risk for hearing loss among the involved staff (Van den Berg-Dijkmeijer et al. 2011). Still, high noise levels can be a stressor, and have been shown to have considerable negative consequences for staff performance in operating departments (Hasfeldt et al. 2010, Weldon et al. 2015, Wong et al. 2010). However, the technical equipment is necessary since the work is associated with high technical proficiency (Bull & FitzGerald 2006, Gillespie & Hamlin 2009), and having adequate equipment is essential for good job performance. Another example from the physical work environment is the existence of electrocautery smoke from chemical compounds. Staff members who are exposed to the smoke during surgery must use protective equipment; however, it does not seem to pose any health risks (Näslund Andreásson 2011). Architectural conditions in operating rooms have been found to benefit from ergonomic improvements (Koneczny 2009). Strenuous postures in work for surgeons, operating room nurses and assistant nurses are a risk factor for musculoskeletal disorders (Gremark Simonsen et al. 2012, Wong et al. 2010).
Nurses’ work in operating departments

The stationed staff in a typical operating department in Sweden is mainly composed of registered specialist nurses with competence in acting as nurse anaesthetists or operating room nurses. In operating departments, a nurse’s duty is to care for the patient during the time before the imminent surgery, during surgery and for a short time after surgery before the patient is handed over to the post-surgery ward.

‘Nurse anaesthetist’ is the international and Swedish name for a registered specialist nurse with the competence to be independently responsible for a patient’s anaesthesia—as assigned by an anaesthesiologist (The Swedish Society of Nursing 2008). In Sweden, ‘operating room nurses’ (also known as “theatre nurses” in the UK) are independently responsible for hygienic and aseptic principles for the prevention of infection and disease transmission to the patient, as well as for technical equipment, instruments and assistance in surgical procedures (The Swedish Society of Nursing 2011). About 14 000 ‘specialist nurses’ work in operating departments in Sweden, a number that also includes intensive care nurses (The National Board of Health and Welfare 2014). The total number of all categories of specialist nurses are 48 500 and the total number of registered nurses are 107 000 (The National Board of Health and Welfare 2015). ‘Nurse managers’ working in operating departments usually have a background as registered specialist nurses. ‘Nurse assistants’ also work in operating departments.

In Sweden today, nurse anaesthetists and operating room nurses must complete four years of education (three years to become a registered nurse and one year for the specialist competence). Nurse assistants undergo two years of basic education, and require both personal suitability and plenty of experience in order to be able to work in an operating department. To a certain extent, nurse assistants and specialist nurses have the same work tasks. Nurse assistants quite often go on to become registered specialist nurses after further education. Descriptions of the educations and professional roles of nurse anaesthetists, operating room nurses and nurse assistants differ between countries; an explanation of the Swedish system is provided below.

The profession of nurse anaesthetists and operating room nurses is an old one, dating back to the late 19th century. Of course, the development of surgery and the operating room has been extensive since then (Hovlind 2005, Sigurdsson 2001). Before 1966, a single educational programme provided the qualifications to work as both a nurse anaesthetist and an operating room nurse. In 1966, however, education for these nurses divided into two separate programmes (Hovlind 2005). Perioperative nursing in Sweden has been influenced by the US system. In 1973, the American Registered Nurses As-
The special technical skills possessed by operating room nurses have traditionally given them a high level of authority in this highly specialised milieu (Gillespie et al. 2008). It is not unusual for operating room nurses to decline to participate or fail in the interaction between technical skills and nursing care, focusing primarily on the technical aspect and seeing patients as objectives. However, interaction between technology and nursing care has also been observed, with nurses seeing patients as human beings (Sørensen et al. 2014). Some studies show a change in operating room nurses’ work, from a very technical orientation towards habits that aim to build friendship with and show respect to the patient (Lindwall & von Post 2008). In addition, the nurses who build nursing care procedures are basing them on a focus on the patient as a person, encouraging confidence-based relationships and situation-related wellbeing in combination with safe technical care (Kelvered et al. 2012). Perioperative dialogue focuses on a continuous relationship between the patient and the nurse anaesthetist or operating room nurse throughout the perioperative period. This means that one of the nurse anaesthetists or operating room nurses has a dialogue with the patient both before and after the surgery and is the one who cares for the patient during surgery. This continuity in patient care has strongly contributed to making the caring side of nurse anaesthetists’ and operating room nurses’ work visible to the patient (Rudolfsson et al. 2007).

The above description of the development of nurses’ work in operating departments provides some context for this thesis. However, since descriptions of the current nursing shortage in operating departments are sparse, the nursing shortage is described within a more general nursing context below.
‘Nursing shortage’ and related expressions’

The typical expression used to describe the need for more nurses in healthcare is ‘nursing shortage’. However, the definition of this term poses some difficulties due to variations in its description as well as varying availability of data on nursing shortages. One way or another, since the demand for nurses outstrips the supply, nursing shortages are a fact. Shortages can be caused by increasing demand, a shortage of nurses or a mixture of these factors (Oulton 2006). The word ‘turnover’ is also often used in research about nursing shortages. Turnover can be defined as the rate at which an organisation loses or gains employees. This term can also be used in various contexts: for example, whether the employee leaves the workplace, the organisation or the entire profession; whether an absence is a temporary leave or a permanent leave; and whether it is voluntary or compulsory (Currie & Carr-Hill 2012). Nursing absenteeism can be due to studies, parental leave, part-time work or sickness. Such absenteeisms also contribute to the problem of nursing shortages. Some research about nursing shortages assesses nurses’ intention to leave. ‘Intention to leave’ is an attitude rather than an action, and as such it needs to be separated from measures of behaviours such as actual turnover (Daouk-Oyry et al. 2014). However, intentions to leave or early signs of leaving have shown to be a strong predictor of actual leaving (Murrells et al. 2008). Intention to leave can indicate an intention to leave the workplace, the organisation or the profession.

‘Nurse retention’

The definition of ‘retention’ is “the continued use, existence, or possession of something or someone” (Oxford dictionary). In the context of nursing shortages, the term is used to indicate a prevention of nurses’ turnover. Promoting the retention of nurses is crucial in many ways and ought to be a priority, although recruitment initiatives must also be considered. From the perspective of patient care quality, nurses who stay in their positions gain knowledge and experience that make them hard to replace with less experienced nurses. From the perspective of work strain, nurses who work with inexperienced nurses have to take on more responsibilities; and from the perspective of health economics, retaining nurses is cost effective (Roche et al. 2014). Van den Heede & Aiken (2013) summarises as follows: “The realization of an organizational context that succeeds to retain nurses within their job is one of the most effective strategies of dealing with nursing shortages” (p 185). Consequently, the focus of this thesis is on the retention of nurses and on factors that make nurses’ work attractive.
The Attractive Work Model

In the discussion on work in healthcare, the expression attractive work is sometimes mentioned; employers wish to offer attractive work and employees wish to have it. In the Attractive Work Model, attractive work has the characteristics of being desirable and of bringing about positive attention from those looking for a job. Although it entails attractiveness from an outside perspective, attractive work also has the ability to retain existing employees, as discussed in this thesis. In this context, attractive work is explained as positive experiences from an inside perspective (Åteg 2006). In the Attractive Work Model, attractive work is seen as a process and as something to strive for, rather than something that can be established once and for all.

The Attractive Work Model was developed through an iterative process of empirical data and theoretical studies within the engineering industry in Sweden, in response to staff shortages in that sector (Åteg et al. 2004, Åteg 2006, Åteg & Hedlund 2011). The model covers a broad variety of attractive work factors. Figure 1 illustrates the Attractive Work Model. In this figure, different areas are represented by the branches, factors are represented by the fruit, and items are represented by the leaves.

Figure 1. An illustration of the Attractive Work Model. Reprinted with permission of the original authors, Tema Arbetsliv and Högskolan Dalarna.
Areas in the Attractive Work Model and how they relate to research on nurse retention

Below follows a description of the areas and factors in the Attractive Work Model and research on nursing shortages that links to these areas and factors.

**Working conditions**

Working conditions are one of the three main areas in the Attractive Work Model. In the model, working conditions describe the conditions that surround the work, and are not a description of specific work tasks. The model describes the factors within working conditions as follows. The Organisation factor includes information about what goes on within the organisation, how prosperous the organisation is and job security. The Loyalty factor includes loyalty towards the organisation, the department and co-workers. The Physical Work Environment factor includes noise, air quality and cleanliness. The Location factor includes the time and cost in getting to and from work. The Leadership factor includes communication with and confidence between the manager and employee; information about the organisation being provided to employees; and innovative management that includes appropriate demands and encouragement, managerial delegation of responsibility and authority, and employee participation and influence. Other important factors include Salary, Hours of Work, Contact (the possibility of social contact), Relationships (how relationships function at work), and Suitable Equipment (Åteg & Hedlund 2011).

Previous studies on nurse retention have also described work conditions as including various aspects. Good teamwork, good interpersonal relationships, good communication with peers, managers and doctors, and having support in work have all been described as important for nurse retention (Carter & Tourangeau 2012, Derycke et al. 2012, Estryn-Behar et al. 2007, Josephson et al. 2008). Leadership seems to have an important influence on nurses’ intention to remain in their jobs (Cowden et al. 2011, Delobelle et al. 2011, Gormley 2011, Heinen et al. 2013). Even when nursing shortages exist, job security seems to be another aspect that influences nurse retention (Coombes et al. 2007). Nurses’ satisfaction with their salaries has been shown to impact their intention to stay (Carter & Tourangeau 2012, Flinkman et al. 2010, Fochsen et al. 2005, Hayes et al. 2012) and satisfaction with work hours and work schedule is also important for nurse retention (Josephson et al. 2008).

In an ethnographic study that was based on interviews with nurses, nurse assistants, surgeons and anaesthesiologists, and on observations from an operating department in an Australian hospital, Gillespie et al. (2008) investigated how characteristics in the organisational culture could have implications for the retention of highly specialised and experienced nurses in operat-
ing departments. They conclude that less experienced nurses need support to fit into role expectations where knowledge, competence, social order and situational control are important indicators. A lack of acceptance as a result of less competence in a role could be a factor leading to nurses leaving their positions.

**Work content**

Work content is another main area in the Attractive Work Model, and includes the factors of what employees do at work and how they perform their work. It also includes the possibilities of being familiar with one’s work, having practical and mental components in work, having variation in work, having healthy activities (bodily activity within work tasks) and having a work rate that includes both intensive and calm periods. Work content also includes the freedom to plan and manage one’s own or others’ work (Åteg & Hedlund 2011).

In previous research on work content and nursing shortages, mental work that includes opportunities to develop and learn new things has been described as important for nurse retention (Carter & Tourangeau 2012, Hayes et al. 2012, van Dam et al. 2013). The ability to influence one’s own work has a positive impact in nurse retention (Estryn-Behar et al. 2007). According to the Demand-Control model, it is important to be able to influence one’s work, and being in control may also help to buffer the impact of high job demands. High demands (such as high productivity and complex and emotionally demanding work tasks) and low control (such as not being able to influence one’s work) can lead to job strain and have been shown to have negative impacts on health (Karasek 1979, Karasek et al. 1981). In addition, according to previous studies, high demands have an impact on nurses’ intention to leave the nursing profession (Chiu et al. 2009, Hasselhorn et al. 2008).

**Job satisfaction**

Spector (1997) defines job satisfaction as the extent to which employees like or dislike their jobs; this indicator can be regarded as a general feeling or attitude. The description of job satisfaction in the Attractive Work Model aligns with this definition. In the model, job satisfaction relates to what employees feel that they can gain from doing the work, how they perceive the job, whether they feel needed, whether the job is interesting and developing, whether they feel appreciated, whether they are proud of their job and whether they perceive themselves as doing a good job (Åteg & Hedlund 2011).

However, the division of the variables that are linked to working conditions or job satisfaction varies between studies. Examples of conditions that Åteg
& Hedlund (2011) consider to be working conditions and that Lu et al. (2005) consider to be factors in job satisfaction are: level of pay, job security, responsibility, management recognition and working hours. Consequently, several studies reveal that nurses who experience high job satisfaction are more likely to stay in their current positions (Cowin 2002, De Gieter et al. 2011, Lu et al. 2005, Utriainen & Kyngas 2009). High job satisfaction has also been examined in relation to high work engagement—both being positive constructs in regard to the individual’s perception of work and work factors (Jenaro et al. 2011, Utriainen & Kyngas 2009).

Additional concepts used in research on nurse retention

The concepts of work engagement, work ability and self-rated health are described below. Research including these concepts has contributed in various ways to current knowledge on nurse retention. These concepts focus on an individual’s qualities and resources.

Work engagement

Nurses who are engaged in their work have been shown to have a decreased intention to leave (Carter & Tourangeau 2012, Collini et al. 2015). The concept of work engagement has been defined by Bakker et al. (2008) as a positive, fulfilling, work-related state of mind of strength and optimal functioning. A concept analysis of work engagement in nursing concluded that it is characterised by vigour, dedication and absorption (Bargagliotti 2012), which is in line with previous research on this topic (Schaufeli et al. 2002).

Work ability

The concept of work ability is defined by Ilmarinen (2009) as how capable the worker is at present and in the near future, as well as how able he/she is to do the work with respect to the work demands and his/her own health and mental resources. Thus, work ability is a combination of the requirements of the work and the abilities of the person who is to perform the work. Work ability is dynamic and can vary throughout an individual’s working life (Ilmarinen 2009). Poor work ability has been shown to predict turnover intention among nurses (Camerino et al. 2006, Derycke et al. 2012).

Self-rated health

Nurses’ self-rated health status is associated with their intention to leave the profession (Daouk-Oyry et al. 2014, Josephson et al. 2008), and nurses who experience musculoskeletal disorders leave the profession more often than
those who do not (Faber et al. 2010, Fochsen et al. 2005). Nurses in operating departments report strain and stressful postures that often involve raised arms; however, they also report having time for recovery between strenuous work tasks. It seems that the muscular rest that takes place between work tasks has a preventive influence on disorders of the neck and shoulder for operating room nurses and assistant nurses (Gremark Simonsen et al. 2012). Van den Berg-Dijkmeijer et al. (2011) have reported that operating room personnel typically report problems with their lower backs and arms/shoulders.
Rationale for the present thesis

Nursing shortages have been, and still are, a major problem in healthcare, both internationally (Sermeus & Bruyneel 2010) and in Sweden (The National Board of Health and Welfare 2014). The nursing shortage negatively influences patients (Hayes et al. 2012), nurses (Hasselhorn et al. 2008) and healthcare organisations (Li & Jones 2013). Large-scale studies on staff-retention problems across Europe show that there are great differences within each country as well as between countries (Aiken et al. 2012, Van den Heede & Aiken 2013).

The nursing shortage problem is discussed in almost all county councils in Sweden today and is reflected in the media as well (Ström 2015). Nursing shortages in operating departments are severe, because they may lead to a reduction in the number of operations. In addition, recruitment is not easy because there is a national shortage of nurses and this is a long-term issue. However, an even more important factor in maintaining well-functioning operating departments is to retain the specialist nurses already working there.

The problem of nursing shortages is quite far from a definitive solution. Research often concludes that improving nursing work environments is a key strategy in retaining nurses; however, this is a quite an unspecified solution. Of interventions that have been done, only modest evidence exists for any particularly successful intervention, although multiple interventions and interventions aiming to promote teamwork and leadership practice seem to be the most beneficial (Lartey et al. 2013).

Consequently, healthcare management understandably faces difficulties in knowing what factors to focus on in order to increase nurse retention. One way to gain more knowledge and hands-on information about this problematic situation is to investigate a healthcare sector in depth—such as operating departments—and penetrate nursing shortages in this area from different perspectives. In order to gain an understanding of registered specialist nurses’ and assistant nurses’ work in operating departments, it is helpful to have the nurses themselves describe their work. Knowledge is needed about what factors guide these nurses’ work and what opportunities they have to carry out their work, considering existing performance obstacles. The use of questionnaires can assist in collecting information from a greater number of nurs-
es on what factors they consider to be important for their work to be attractive. These perspectives as provided in this thesis should deliver specific knowledge that can help management to understand which improvements are most beneficial for nurse retention, and guide future investments in possible solutions.
Aims

The overall aim of this thesis was to gain knowledge of registered specialist nurses’ and assistant nurses’ work in operating departments and of what factors they consider to be important for attractive work.

Study I
The aim of this study was to describe operating room nurses’ work from their own perspective.

Study II
The aim of this study was to capture attractive qualities of registered specialist and assistant nurses’ work in Swedish operating departments and to take a first step in the process of adapting the Attractive Work Questionnaire for use in a healthcare context.

Study III
The aim was to examine significant factors for work attractiveness and how these factors differ from the current work situation for operating department nurses. A second objective was to examine associations between age, gender, length of employment, work engagement, work ability, self-rated health indicators and attractiveness of the current work situation.

Study IV
The aim of this study was to describe how nurse managers, registered specialist nurses and non-registered assistant nurses interpret stated organizational goals and their own daily goals, and to identify performance obstacles for nurses in an operating department.
Methods

Investigating nurses’ work with the intention of increasing nurse retention can be done using different approaches and in different settings. This thesis focuses on nurses’ work and attractive work factors in operating departments, and in order to gain as much knowledge as possible about these topics, different approaches have been chosen. To discover how nurses in operating departments describe their own work from an individual perspective, a phenomenographic approach was chosen in Study I. The phenomenographic approach assumes that people’s understanding of a phenomenon is revealed in their way of speaking and acting (Marton & Booth 1997), and this approach has been shown to be suitable when describing individuals’ perspective on their work (Larsson 2004). Individuals experience and understand aspects of a phenomenon in different, but limited, ways (Marton 1986, Marton & Booth 1997). Another approach in investigating nurses’ work in operating departments involves using questionnaires. This method enables larger sample sizes and allows the collection of data to be quantified (Polit & Beck 2008). In Studies II and III, nurses were asked to rate factors in terms of their significance in making work attractive and in terms of the attractiveness of their present work. In order to assess attractive work, a questionnaire was validated and other concepts and factors that are known to impact nursing shortages and nurse retention were tested for association with attractive work. Study IV is a case study. In a case study, data can be derived from different sources such as individuals, groups and organisations (Merriam 1998, Polit & Beck 2008, Yin 2009), and case studies can be used to study phenomena in healthcare (Anthony & Jack 2009). The perspective used in Study IV is intended to grasp concrete descriptions of work. A manifest content analysis of structured interviews was conducted according to predetermined aspects in order to fulfil this goal (Waldenström 2007).

Study design

In order to obtain a comprehensive description of nurses’ work and of attractive work qualities in operating departments, both qualitative and quantitative data sources were considered beneficial in this thesis. Study I comprised qualitative data, Studies II and III comprised quantitative data and Study IV
was a descriptive case study with qualitative and quantitative data sources. Table 1 presents an overview of the studies.

Table 1. An overview of the design, data collection, sample and data analysis of the four studies in this thesis. The data collection and sample are the same in Studies II and III.

<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Data collection</th>
<th>Sample</th>
<th>Data analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Descriptive</td>
<td>Individual interviews</td>
<td>Operating room nurses (n=15)</td>
<td>Phenomenographic analysis</td>
</tr>
<tr>
<td>II</td>
<td>Cross sectional</td>
<td>Questionnaire</td>
<td>Operating room nurses, nurse anaesthetists and assistant nurses (n=147)</td>
<td>Descriptive, principal component Analysis (PCA) and Cronbach’s alpha analyses</td>
</tr>
<tr>
<td>III</td>
<td>Same as Study II</td>
<td>Same as Study II</td>
<td>Same as Study II</td>
<td>Descriptive, correlational and multiple regression analyses</td>
</tr>
<tr>
<td>IV</td>
<td>Descriptive case study</td>
<td>Individual interviews, Group interviews, Review of Goal documents and Operating schedule</td>
<td>Nurse managers (n=4), Operating room nurses (n=6), Nurse anaesthetists (n=12), Assistant nurses (n=3, n=4)</td>
<td>Manifest content analysis according to predetermined aspects of work</td>
</tr>
</tbody>
</table>

Study settings

Studies I to IV were completed in two county councils in central Sweden. Study I was conducted at the operating departments of two county hospitals in two county councils of equal population size (280 000 inhabitants). These two operating departments possessed 10 and 13 operating rooms, respectively, and performed general, orthopaedic and gynaecological surgery. Surgeries included planned operations on weekdays as well as emergency on-call surgery on evenings and weekends (24-hour surgery).

Studies II and III were conducted at four operating departments in four different hospitals within one of these county councils. All of the operating departments performed general, orthopaedic and gynaecological surgery. Two of the operating departments performed day surgery only; these had 4 and 5 operating rooms, respectively. The other two operating departments had 7 and 10 operating rooms, respectively, and performed both planned
operations on weekdays and emergency on-call surgery on evenings and weekends (24-hour surgery). Study IV took place in the largest (24-hour surgery with 10 operating rooms) of the four operating departments that were included in Studies II and III. This operating department was chosen as a representative department in order to grasp the ordinary and typical circumstances and conditions of nurses’ work as a so-called representative case (Yin 2009).

Sample
Study I
A convenience sampling method was used to select the 15 registered operating room nurses to be interviewed. Of these, 12 were women and 3 were men. Interviewees’ professional experience as an operating room nurse ranged from 3–38 years, with a mean of 15 years. All interviewees were employed at the hospital where the interview took place.

Studies II and III
Out of the total number of employed nurses (n=220), 147 (67%) responded to the questionnaire. These respondents included 46 registered operating room nurses, 70 registered nurse anaesthetists and 31 assistant nurses; 88% of the respondents were women. The mean age was 54 years (with a range of 24–66 years). The mean time of employment in the current position was 16.5 years (with a range of 9 months to 44 years). There were no statistically significant differences (as per Fisher’s Exact Test) between respondents versus non-respondents regarding gender or profession. A statistically significant difference was found between respondents versus non-respondents regarding which operating departments the nurses worked in (p=0.31). These data are from Study II; there were small differences between the samples in Studies II and III due to four persons’ multiple work commitments that were treated differently in the two studies.

Study IV
All nurse managers (n=4) consented to participate in the individual interviews, and all of these had a background as registered specialist nurses. A convenience sampling method was used to select participants for the group interviews. Registered nurse anaesthetists (n=12, one group interview), operating room nurses (n=6, one group interview) and nurse assistants (n=4 and n=3, two group interviews) made up the nursing staff in the operating department.
Data collection and procedures

Study I
The interviews were completed by one of the authors (CB) in 2006. The interviews took place without disturbance in a secluded room next to the operating departments. In-depth interviews with open-ended questions were used in order to capture what the operating room nurses focused on in describing the phenomenon of their work (Marton 1986). Three questions guided the data collection: “What aspect of your work do you find the easiest? What aspect of your work do you find the most challenging? What do you think is the most important aspect of your work?” These interview questions were inspired by DallÁlba (1998), and have previously been used in phenomenographic studies (Larsson 2004). In order to deepen the interviews, the interviewer used “what” and “how” questions to probe the responses, and encouraged the operating room nurses to give concrete examples of their work. The interviews were audio-taped and lasted between 19–50 min, with a mean of 35 min.

Studies II and III
The questionnaires were personally distributed in 2009 by one of the authors (CB) to the nurses at their work. The questionnaires were handed out along with an informational letter and a prepaid response envelope. Nurses who were not present at their workplace on the distribution day were sent the questionnaire and information at their home addresses. When necessary, the questionnaire was followed by two reminders that were sent to the respondents’ home addresses by an independent administrator who had access to code numbers for the participants. The nurses had permission from the management to take the time they needed to fill in the questionnaire during their work time, as long as it did not interrupt planned surgical procedures. Demographic data such as age, gender and length of current employment were provided by participants on the questionnaire. The hospital administration added information on profession, current workplace and employment level.

The attractiveness of work was assessed using the Attractive Work Questionnaire. Figure 2 provides an example of how items were presented in the questionnaire.
Work engagement was assessed on the Utrecht Work Engagement Scale (UWES) instrument, 17-item version (Hallberg & Schaufeli 2006). The UWES has been used in several nursing science studies (Bargagliotti 2012) and the Swedish translation has been validated (Hallberg & Schaufeli 2006). Work ability was assessed with one item from the Work Ability Index (WAI) questionnaire (Illmarinen 2009). WAI has been used in research on nurse retention (Derycke et al. 2012) and in a Swedish working population (Lindberg et al. 2009). General health was assessed with one item from the Short Form SF36 Health Survey (Persson et al. 1998) that has been used earlier in a Swedish study on nurse turnover intentions (Josephson et al. 2008). General health was also assessed in terms of musculoskeletal pain and discomfort in different parts of the body in accordance with Kuorinka et al. (1987). This assessment was rated on the Borg CR-10 scale (Borg & Borg 2001). The Borg CR-10 scale was developed in Sweden and has been widely used and validated (Borg & Borg 2001). Table 2 presents an overview of the included questionnaires.

Table 2. Included questionnaires, number of items and scale.

<table>
<thead>
<tr>
<th>Name of questionnaire</th>
<th>Assessing</th>
<th>Number of items</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attractive Work Questionnaire</td>
<td>Attractiveness of work</td>
<td>87</td>
<td>5-point</td>
</tr>
<tr>
<td>Utrecht Work Engagement Scale</td>
<td>Work engagement</td>
<td>17</td>
<td>7-point</td>
</tr>
<tr>
<td>Work Ability Index</td>
<td>Work ability</td>
<td>1</td>
<td>3-point</td>
</tr>
<tr>
<td>Short Form SF36 Health Survey</td>
<td>General health</td>
<td>1</td>
<td>5-point</td>
</tr>
<tr>
<td>Borg CR-10 scale</td>
<td>Musculoskeletal pain, discomfort and pain intensity in different parts of the body in accordance with Kuorinka et al. (1987)</td>
<td>2 (neck and lower back)</td>
<td>12-point</td>
</tr>
</tbody>
</table>
Study IV

All interviews were completed in 2009, with two of the authors present at each (CB/MJ, CB/DR). The interviews were audio-taped and lasted for 1–2 hours. All interviews took place in different secluded rooms outside the operating department that would be free from disruption. The interviews followed predetermined aspects according to the ARIA guide (an acronym derived from the Swedish expression for work content analysis guide) (Waldenström 2007). The questioning aspects were about the workplace (resources, design, equipment and sufficient nursing staff), organisation, work commitment, goals (stated organisational goals and daily work goals), influence over work, psychological/mental demands and possibilities, obstacles and aggravating circumstances in work, time pressure and time-bound work. The interviewers strove to ask questions in a systematic way until they could accurately describe “how things were”; if needed, they asked for concrete examples of situations related to the questions (Waldenström 2007). Data concerning goal documents were collected from the local hospital intranet and data concerning the number of planned, acute and cancelled operations were collected from the statistical operating programme.

Data analysis

Study I

The audio-taped interviews were transcribed verbatim and read several times for familiarisation with the empirical material and to correct errors in the transcription. From “what” the operating room nurses said in the interviews, “what” categories were formed and grouped based on similarities and dissimilarities in the answers. Thereafter, further categorisation was done based on “how” the operating room nurses described their answers in the “what” categories. The findings were formed by a fusion of the “what” and “how” categories. The last step was to name the categories and to provide a contrastive comparison of them. The result is called the outcome space, which is the collective human experience derived from different individuals about a studied phenomenon, which in this case is the nurses’ work (Åkerlind 2005).

Study II

In Study II, the data analyses included the Attractive Work Questionnaire. The process of adapting the Attractive Work Questionnaire for use in healthcare started with face validity in order to ensure that the items measured what they were supposed to (Polit & Beck 2008). A content validation (Streiner & Norman 2008) was the next step. This was done to ensure that the items were suitable for operating departments. Items that described con-
ditions that were irrelevant or impossible to achieve in operating departments were excluded from further analysis. For example, the item “There are workmates at my workplace” was excluded, as it did not contribute to the assessment of attractive work for nurses in operating departments because the staff always works in teams. An additional strategy involved selecting the items with the highest ratings for how important the item was in causing work to be attractive. For example, if 80% of the participants rated “Entirely” or the option next to “Entirely”, the item was kept. This cut-off limit was inspired by the work of Ferguson and Cox (1993). In order to determine the underlying structure of the selected items, a principal component analysis (PCA) was conducted. For the rest of this thesis, PCA will be referred to as “factor analysis”, a term that is typically used in nursing research (Watson & Thompson 2006). Interpretations of new factors were conducted in order to name them, either with existing factor names from the original Attractive Work Questionnaire or with new factor names. Finally, Cronbach’s alpha was calculated in order to determine the internal consistency reliability of the new factors.

Study III
In Study III, analyses of the Attractive Work Questionnaire, Utrecht Work Engagement Scale, one item from the Work Ability Index, a single item from the Short Form SF36 Health Survey and Borg CR-10 scale were performed, as listed in Table 2. For the Attractive Work Questionnaire, the mean values and standard deviations were calculated for the nurses’ responses both in correspondence to their present work situation and to significance for work attractiveness. Differences between ratings of correspondence to current work situation and ratings of significance were also calculated. As the Attractive Work Questionnaire has not been used in healthcare before, it was of interest to examine former factors known to influence nurse retention, such as age, gender, length of employment, work engagement, work ability and self-rated health indicators, and their associations to the attractiveness of the current work situation. These associations were calculated using Kendall’s Tau correlations, and a t-test was used to test for gender differences and present attractive work situations. In order to predict factors affecting nurses’ perception of current attractive work situations, a multiple regression model was fitted with the total attractiveness of the current work situation as the dependent variable and age, gender, employment time, work engagement, work ability, general health, and prevalence and intensity of pain in neck and low back were used as independent variables in the regression analyses. The model was validated by bootstrapping (Harrell 2001), using the R function ‘validate’ from the rms package.
Study IV

The interviews were listened to, transcribed, and read in order to form an understanding of the interviews and the text. All interviews were analysed separately. Answers that provided concrete descriptions of work performance according to the predetermined aspects were extracted. The criteria for identifying performance obstacles were identified as when the consequences of working conditions caused loss of quality, overtime work and work without breaks. The manifest content was kept in focus; that is, the external perspective describing “how things were” with a minimum of interpretation (Waldenström 2007). The extracted citations from each nurse manager’s individual interview were analysed together with all individual interviews, and the extracted citations from each group interview were analysed together with all group interviews. The organisational goal documents were reviewed with regard to how the goals were constituted, their applicability in daily work in the operating department and if and how the goals were evaluated. The numbers of planned, acute and cancelled operations were extracted from the statistical operating programme.
Ethical considerations

For all the studies in this thesis, the International Council of Nurses (ICN) Code of Ethics (2007) was applied. It states that nurses function in many roles, not only in work with patients but also in collaboration with colleagues and doing research. To fulfil this code of ethics, it is a nurse researcher’s duty to treat colleagues with respect and to advance the profession through research (International Council of Nurses Code of Ethics 2014).

Study I
After the study had been approved by the heads of the two operating departments included in the study, an informational letter about the purpose of the study was distributed to all operating room nurses. Participants were notified that participation was voluntary, that withdrawal at any time was possible and that the results would be confidential (Codex Rules and Guidelines for Research 2012). Information was also given verbally to the operating room nurses at a department meeting. The ethical issue that was particularly considered in this study was the working relationship that existed between the nurse researcher and some of the interviewees. This relationship might have pressured individuals to participate and prevented a feeling of confidentiality. Still, the conclusion was that the benefit of conducting the interviews would outweigh possible negative consequences. At the time of the study, there was no requirement for appeal to the Regional Ethical Review Board.

Studies II and III
Both studies were approved by the Regional Ethical Review Board in Uppsala (approval number 2008/175) and by the participating hospitals. Written information about the purpose of the study, voluntary and confidential nature of participation, possibility for withdrawal at any time and confidentiality of results was given to all participants. Consent was implied through the completion of the questionnaire. A second ethical issue that was particularly considered in these studies was that the questionnaires were personally distributed by one of the authors. This may have been considered as extra pressure to participate and may also have reduced the sense of confidentiality.
Study IV

Study IV was approved by the Regional Ethical Review Board in Uppsala (approval number 2008/175) and also by the head of the operating department involved. An informational letter was distributed during an information meeting for the staff about the study. Time and opportunity were provided for staff to ask questions about the study. The information consisted of the study background, purpose and methods. In addition, participants were told that participation was voluntary, that they had the right to withdraw and that the results would be confidential (Codex Rules and Guidelines for Research 2012). The ethical issue particularly considered in this study was as follows: One of the authors worked part-time as an operating room nurse in the department studied, and while this relationship between an author and the participants may have facilitated participation, it may also have entailed a risk of participants feeling pressured to participate and feeling a lack of confidentiality. Participation in the interviews was not judged to pose any real risk of discomfort or privacy violation.
Results

Study I
The aim of Study I was to describe operating room nurses’ work from their own perspective. Three different ways of understanding the operating room nurses’ work were revealed through a fusion of the “what” categories and the “how” categories, as visualised in Figure 3. In Figure 3, the “what” categories are formed of “what” the nurses expressed in the interviews. This was taken further in an analysis of “how” the nurses described their “what”, which became the “how” categories. The fusion of the “what” and “how” categories is illustrated by the outcome space.

Figure 3. Overall result of the phenomenographic analyses
One aspect of the work of an operating room nurse was to be prepared for the operation. The operating room nurses needed to be in control of the different work tasks in order to be able to be one step ahead of the surgeon during the operation. This involved planning the operation in advance, making sure the supplies of sterile goods were sufficient throughout the day, having the right equipment available and being in control of the sterile field during the operation. There was a certain amount of anxiety associated with the perception of not having control and that this lack of control might harm the patient. Good teamwork was assumed to be enhanced by being attentive to the spoken and unspoken wishes and needs of the patient and of all members of the team, especially the surgeon. Well-functioning teamwork had an impact on several aspects of the work, such as smoother logistics between operations. Trust, acceptance and good communication were important components of well-functioning teamwork. A perceived lack of respect for the operating room nurses’ profession could result in poor teamwork. The operating room nurses described how it took years of experience to become an operating room nurse with the ability to function well in all sorts of operations. The way to reach this competence was by assisting at many operations: learning by doing.

Study II

The aim of this study was to capture attractive qualities of nurses’ work in Swedish operating departments and to take a first step in the process of adapting the Attractive Work Questionnaire for use in a healthcare context. Figure 4 shows the process of adopting the Attractive Work Questionnaire to a healthcare context. The Attractive Work Questionnaire included a total of 87 items in three areas: working conditions, work content and job satisfaction. The first step in the process of adopting the questionnaire involved testing the face validity. None of the items had explicitly high missing answers (between 2 and 10 on every item) and the items were judged to be understandable and measuring what they were supposed to measure. The next step was a content validation, in which the authors examined the items and kept all those deemed adequate for operating departments: a total of 70 items. In selecting the most important items for the work to be attractive, 80% of the participants had rated “Entirely” or the option next to “Entirely” for 51 items. One out of five cross-loaded items was removed; this resulted in 50 items on the questionnaire.
Figure 4. The process of adopting the Attractive Work Questionnaire to healthcare; throughout this process, the three areas of working conditions, work content and job satisfaction were left unchanged.

The three main areas of working conditions, work content and job satisfaction were kept from the original Attractive Work Questionnaire, and the factor analysis was conducted in each of these three areas. The underlying structure of the items that were kept showed consistency with the original Attractive Work Questionnaire, and most of the factor names were very suitable to keep. The internal consistency reliability of the new factors was satisfying. Table 3 shows the final factor-solution and the Cronbachs alpha analysis, together with the adapted Attractive Work Questionnaires areas, factors and items.
Table 3. *Areas, factor names and items and the factor loadings from the rotated solution from the factor analysis, and internal consistency reliability as measured by Cronbach’s alpha (α) in the adapted Attractive Work Questionnaire.*

<table>
<thead>
<tr>
<th>Area</th>
<th>Factor</th>
<th>Item</th>
<th>Factor loading</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working condi-tions</td>
<td>Relationship</td>
<td>-We have a good team spirit</td>
<td>0.758</td>
<td>0.89</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-We are honest with one another</td>
<td>0.786</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-We are open with one another</td>
<td>0.801</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-We have a sense of humor (laugh and have fun)</td>
<td>0.790</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-We help and support one and other</td>
<td>0.831</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-I feel loyal to my workplace</td>
<td>0.461</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-I fell loyal to my workmates</td>
<td>0.594</td>
<td></td>
</tr>
<tr>
<td>Leadership</td>
<td></td>
<td>-The communication with my immediate supervisor is working well</td>
<td>0.774</td>
<td>0.90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-I have confidence in my immediate supervisor</td>
<td>0.808</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-My immediate supervisor has confidence in me</td>
<td>0.815</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-My immediate supervisor places appropriate demands on the work I shall perform</td>
<td>0.722</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>--My immediate supervisor encourage me</td>
<td>0.764</td>
<td></td>
</tr>
<tr>
<td>Equipment</td>
<td></td>
<td>-I can perform my work well with the equipment I use</td>
<td>0.874</td>
<td>0.84</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-The equipment is modern</td>
<td>0.826</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-I can do my work well with a reasonable physical workload</td>
<td>0.738</td>
<td></td>
</tr>
<tr>
<td>Category</td>
<td>Statement</td>
<td>Score (Q1)</td>
<td>Score (Q2)</td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>------------</td>
<td>------------</td>
<td></td>
</tr>
<tr>
<td>Salary</td>
<td>- I can do my work well with a reasonable mental workload</td>
<td>0.588</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- My salary is sufficient</td>
<td>0.863</td>
<td>0.84</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- My performance affects my salary</td>
<td>0.755</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- My salary increases regularly</td>
<td>0.696</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- My salary is high</td>
<td>0.863</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisation</td>
<td>- I receive regular information about activities in the organisation</td>
<td>0.631</td>
<td>0.73</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The organisation is consciously developing fresh approaches</td>
<td>0.705</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- There is a creative spirit and a curiosity to try new ideas in the day-to-day work at my workplace</td>
<td>0.707</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- I can influence and participate in the activities at my workplace</td>
<td>0.661</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- I feel my job is secure</td>
<td>0.404</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Work Environment</td>
<td>- The noise levels are good where I work</td>
<td>0.533</td>
<td>0.84</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The air is fresh</td>
<td>0.730</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- It is clean inside the premises</td>
<td>0.712</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>- It is easy for me to get to and from work</td>
<td>0.923</td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Travel time to and from work is short</td>
<td>0.901</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working Hours</td>
<td>- I know when my working day</td>
<td>0.650</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>Work content</td>
<td>Mental Work</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>begins and ends</td>
<td>-I have some say over my working hours 0.726</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-I can take time off if I need to 0.645</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Autonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>-I am familiar with work (know what and how to perform my work tasks) 0.777</td>
</tr>
<tr>
<td>-I organize and manage my own work 0.782</td>
</tr>
<tr>
<td>-I can choose how to do my work tasks 0.505</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>-My work is intensive, but also includes calm periods and breaks 0.852</td>
</tr>
<tr>
<td>-I have time for reflection and recovery in my work 0.826</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Job satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>-My competence is in demand 0.685</td>
</tr>
<tr>
<td>-I consider what I do to be important 0.609</td>
</tr>
<tr>
<td>-My work is positively challenging 0.861</td>
</tr>
<tr>
<td>-I have interesting work tasks 0.844</td>
</tr>
<tr>
<td>-My work enables me to develop 0.819</td>
</tr>
<tr>
<td>-I feel proud to tell people what I do for a living 0.640</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Acknowledgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>-I get apprecia- tion from my 0.802</td>
</tr>
</tbody>
</table>

0.75
Study III

The aim was to examine significant factors for work attractiveness and how these factors differ from the current work situation for operating department nurses. A second objective was to examine associations between age, gender, length of employment, work engagement, work ability, self-rated health indicators and attractiveness of the current work situation. The nurses rated the correspondence of attractive work factors to their present work situation with a variation in mean value between 2.4–4.2 They rated the significance of the same factors to work attractiveness with a variation between 4.3–4.7 on the five-point Likert scale. Thus, significance was rated higher than correspondence to present work situation, as shown in Figure 5. The factors that were held to be most important for attractive work were Relationship, Leadership and Status; and the factors that held the largest discrepancies between their importance for work attractiveness in general and their ratings in the nurses’ current work situation were Salary, Physical Work Environment and Organisation.
Correlations between factors that are already known to influence nurse retention, such as age, gender, employment time, work engagement, work ability, self-rated health indicators and present attractive work situation were calculated. A statistically significant positive correlation in the nurses’ ratings between work engagement and attractive work (Tau 0.352, p < 0.001) was found. The fitted multiple regression model with the independent variables of age, gender, employment time, work engagement, work ability, general health, intensity of neck pain and intensity of lower back pain showed that the independent factors that significantly predicted nurses’ perception of a current attractive work situation (dependent variable) were work engagement (p<0.0001) and age (p=0.01). The independent variables explained 23% of the variance in total attractiveness.
Study IV

The aim of this study was to describe how nurse managers, registered specialist nurses and assistant nurses interpret stated organisational goals and their own daily goals, and to identify performance obstacles to carrying out nursing work in an operating department. The daily operating schedule, not the organisational goal documents, guided the daily work. The nurses had very little influence over the operating schedule that guided their work. And although acute and cancelled operations were regular activities, these were interpreted as obstacles in reaching the daily goals. In the nurses’ work, obstacles were identified that prevented the aim of finishing the operating schedule with a good quality of patient care. A permanent shortage of specialist nurses sometimes resulted in overtime work. The operating schedule underwent constant changes such as cancelled and acute operations, which resulted in extra work and required nurses to rush through medical records rather than make calm preparations. The design of the premises had the equipment spread throughout the ward and thereby resulted in extra work and the risk of decreased quality in patient care. Although the nurses considered quality of care to be highly important, no standardised evaluations were performed. The findings of the predetermined questioning aspect “goals” identified performance obstacles, and the consequences of these performance obstacles are visualised in Figure 6.

Figure 6. The nurses’ work goals, obstacles in reaching the goals and consequences of these obstacles.
It was unclear which goals the nurse managers were required to focus on, and they experienced uncertainty regarding what was expected of them concerning their work. Nurse managers who had a position on the operating department had limited influence over their own work. Other nurses entered their offices at any time to express concerns or simply to chat. The nurse managers saw this communication with the nurses as important; however, this “open-door” policy created disturbances in an already stressed schedule of work tasks. The nurse managers experienced many changes in time limits for different tasks, such as preparations before meetings and scheduling the nurses.
Discussion

From their own perspective, the operating room nurses’ work required conditions that allowed time for preparations before surgery in order to be in control and to be one step ahead of the surgeon. The possibility of good teamwork was said to be enhanced by nurses being attentive to the spoken and unspoken wishes and needs of the patient and of all members of the team. Well-functioning teamwork was also perceived to make the logistics between operations easier. Trust, acceptance, good communication and having the same goals were components of good teamwork. Operating room nurses developed in their work by assisting in many operations (Study I). In the adaptation of the Attractive Work Questionnaire for use in a healthcare context in Sweden, it was possible to identify attractive factors for nurses in operating departments. The three areas from the original Attractive Work Questionnaire were unchanged during the adaptation process. The factor analysis resulted in major consistency with the original Attractive Work Questionnaire. The internal consistency between the items within each factor was found to be in a desirable range for most of the factors (Study II). In the area of work conditions, attractive factors for nurses’ work in operating departments were Relationship, Leadership, Equipment, Salary, Organisation, Physical Work Environment, Location and Working Hours. In the area of work content, attractive factors were Mental Work, Autonomy and Work Rate; and in the area of job satisfaction, attractive factors were Status and Acknowledgement.

A majority of the attractive factors identified in Study II were coherent with earlier results from studies on nurse retention in various healthcare settings and countries. Attractive factors that were found here but that are less discussed in earlier research included: Equipment, Physical Work Environment and Location (Study II). Nurses rated the importance of factors for work attractiveness more highly than how they rated the attractiveness of the same factors in their present work situation. Salary, Physical Work Environment and Organisation held the largest discrepancies between how the nurses assessed the importance of each factor for work attractiveness and how they rated each factor in their present work. Relationship, Leadership and Status were the most important factors for work attractiveness (Study III).
Work engagement was significantly positive correlated with the current attractiveness of the nurses’ work. Also, in the multiple regression model, work engagement predicted attractive work. Work ability and self-rated health indicators seem to be separate dimensions in the field of nurse retention (Study III).

The way in which the nurses interpreted the stated organisational goals and their own daily goals identified ambiguity in goals as well as goal incongruence. The nurses had limited knowledge of the stated goals of the organisation and their daily goal was to finish the operating schedule with a good quality of patient care. Changes in the operating schedule, such as acute and cancelled operations, were interpreted as obstacles even though these were regular activities. Given the daily changes, there were often insufficient prerequisites in order for nurses to finish the operating schedule. The performance obstacles for nurses in an operating department were a shortage of nurses, an over-optimistically planned operating schedule in terms of time, supplies that were spread throughout the ward, technical equipment that had to be moved between operating rooms during surgery and badly placed computers in the operating rooms.

The summary of the main findings from this thesis of nurses’ work and attractive work factors in operating departments is in many ways consistent with research on nurse retention. This consistency is present in the importance of experiencing good relations and leadership and in perceiving that one’s work grants status. Salary, Physical Work Environment and Organisation held the largest discrepancies between how the nurses assessed the importance of each factor for work attractiveness and how they rated each factor in their present work. This thesis also provides additional knowledge of attractive factors in nurses’ work, such as the Physical Work Environment, Equipment (to carry out the work), and Location (of the workplace)—factors that will require further investigation. In addition, the nurses’ daily goals were not realistic for them to reach on a daily basis, and their daily goals had limited congruence with the organisational goals.

Attractive work for nurses in operating departments

One of the intentions for the adaptation of the Attractive Work Questionnaire for nurses in operating departments was for it to become a useful tool for management and for it to provide support in implementing improvements to increase attractiveness in nurses’ work. There was a wide range of highly rated factors for work attractiveness within the areas of work condition, work content and job satisfaction (Studies II and III). Many of these factors are the same regardless of profession or workplace (Åteg & Hedlund 2011).
Consequently, in order to get an understanding of what these attractive factors mean to nurses in operating departments, there is a need to discuss what nurses’ work in operating departments looks like (Study I and IV).

In the following discussion of nurses’ work and attractive work, the structure of the Attractive Work Model (Åteg & Hedlund 2011) is used. The model is visualised in Figure 1, in which the big branches represent the three main areas of work conditions, work content and job satisfaction; the fruit represent the factors; and the leaves represent specific items. The factors that were assessed to be the most significant for work attractiveness (Relationships, Leadership and Status), the factors that held the largest discrepancies between significance for work attractiveness and their presence in nurses’ current work (Salary, Physical Work Conditions and Organisation) and the factors that have not been much discussed in earlier research (Equipment and Location) will be the focus of this discussion.

Work conditions according to the Attractive Work Model

Relationship: good team spirit, honesty, openness, humour, support and loyalty

Relationship was assessed to be a highly significant factor for work attractiveness (Studies II and III). In nursing contexts, good teamwork and interpersonal relationships have been found to be important for nurse retention (Estryn-Behar et al. 2007, Derycke et al. 2012). In operating departments, teamwork is essential. Not only is it beneficial for surgical performance (Gillesspie & Hamlin 2009, Hull et al. 2012); the nurses also express feelings of effectiveness and fun when all staff members are attentive to and trust each other (Study I). Enjoyment in work has also been linked to work effectiveness by Arakelian et al. (2008). However, when the nurses described their work from an individual perspective, some negative aspects regarding teamwork arose. They described failures in teamwork and feelings of a lack of respect and understanding between different professional groups (Study I). These negative aspects may explain the gap between how significant nurses found the Relationship factor to be in work attractiveness and their rating of this factor in their present work (Study III). Thus, when different professions work very close together, as in an operating department, a lack of understanding for each other’s professions can result in a lack of teamwork.

Leadership: well-functioning communication, confidence between employee and management, appropriate managerial demands and encouragement

Leadership was also assessed to be a highly significant factor for work attractiveness (Studies II and III). The significance of good leadership for
work attractiveness, as found in Study III, is supported by previous research on nurse retention. The nurse manager’s behaviour has a great impact on work climate and job satisfaction (Sellgren et al. 2009). Nurses’ opportunities for participative governance are crucial, both for creating a positive work environment and for nurse retention (Gormley 2011). A transformational leadership style (Cowden et al. 2011), which specifically involves being visible, consulting with nurses, and giving praise, positive feedback, and recognition (Duffield et al. 2010), is important in increasing nurse retention. Transformational leadership is also a crucial part of the Magnet Recognition Program (American Nurses Credentialing Centre 2014, Kramer & Schmalenberg 2005, Wolf et al. 2008). The Magnet Recognition Program is a strategy towards retaining and recruiting nurses and improving patient outcomes (Kelly et al. 2011, Kutney-Lee et al. 2015, Wolf et al. 2008). The importance of good leadership was demonstrated by Delobelle et al. (2011), who concluded that turnover intention was influenced more by leadership than by colleagues.

The “open-door” management style described in Study IV is an example of management’s intention to be available for communication with nurses, although this way of handling communication has a negative impact for nurse managers in the form of constant interruptions. This situation leads to the question of how a nurse manager can do a good job, given that the preconditions of the job are sub-optimal, with limited possibilities for influencing work and with long working hours as described in Study IV. Previous research also identifies a shortage of nurse managers (Brown et al. 2013). Factors that increase nurse managers’ decisions to leave work include: work overload, a lack of time to complete tasks (Brown et al. 2013), an inability to ensure high quality patient care, insufficient resources and a lack of empowerment and recognition (Hewko et al. 2014). On the other hand, having job control has been found to be a predictor for nurse managers remaining on the job (Skagert et al. 2011).

**Salary: a sufficient, increasing, high and performance-affected salary**

Salary was the factor with the largest discrepancy between how nurses assessed its significance for work attractiveness and how they rated it in their present work (Studies II and III). Salary has been addressed in research on nurse retention, but not to a great extent. Discontent with wages has been shown to increase nurses’ intention to leave the profession (Flinkman et al. 2010, Fochsen et al. 2005). However, other researchers (Carter & Tourangeau 2012, Chan et al. 2013, Hayes et al. 2012) express a more moderate conclusion: that although wages may be a significant factor for nurse retention, it is not the only answer to the complex nursing shortage situation. In a study by Sellgren et al. (2009), nurses expressed diverging opinions on how
salary impacted their decision to remain at work; some said it was an important factor, whereas others said it was of little importance.

**Organisation: information, fresh approaches by the organisation and in daily work, influence and job security**

The Organisation factor also showed a discrepancy in how the nurses assessed its significance for work attractiveness and how they rated it in their present work (Study III). An organisational structure with few levels and the possibility of influencing their own work both has implications for nurse retention (Van den Heede et al. 2013, Estryn-Behar et al. 2007). One way of increasing nurses’ influence in operating departments is to involve them in the planning of the operating schedule (Study IV). The nurses included in Study IV considered themselves to have important knowledge that could facilitate logistics as well as release time for preparations prior to surgery, which was described as a fundamental part of nurses’ work (Studies I and IV). Although involving nurses in planning an operation schedule is not usual, it has recently been tested and was found to be successful (Sandbaek et al. 2014).

Requiring a sense of job security might seem far-fetched in times of nursing shortages; however, job security has been shown to play a role in nurse retention (Coombs et al. 2007, Study II). Studies II and III were conducted in a county council with few operating departments. Organisational discussions of effective hospital care make small rural hospitals vulnerable to hospital shut-downs. In addition, nurses may need to travel long distances to reach bigger cities with more hospitals and job offers. Under these circumstances, the importance of job security as an attractive factor for nurses’ work makes sense.

Although the Attractive Work Questionnaire does not include it, the organisational aspect of goals was discussed in Study I and IV. Goals are what actually guide nurses’ work, and the nurses expressed the importance of having common goals to guide their work (Study I). However, goal incongruence was present both at the management level and for the nurses in Study IV. The nurse managers were uncertain which organisational goals to focus on, although they had clear daily goals. The nurses were unaware of the organisational goals, but they too had clear daily goals (Study IV). However, whether goal incongruence is linked to work attractiveness for nurses is unclear, and to our knowledge, any relation that may exist between goal incongruence and nurse retention has not been investigated. Goal incongruence like that described in Study IV is also described in a study by Johansson et al. (2007) regarding nurse managers’ work in care for older people. That study describes a lack of clarity regarding goals on a management level as well as a lack of practical organisational goals to guide the work of the
staff. However, Schmidt (2010) concludes that the fit between personal and organisational goals needs improvement among healthcare workers in order to reduce the high risk of job strain.

**Physical Work Environment: noise, air and cleanliness of the premises**
The Physical Work Environment factor is particularly important in the high-tech environment of an operating department, where various ergonomic deficiencies and potential hazards for the staff exist (Koneczny 2009). Study IV describes a less functional design of the premises, with medical equipment and supplies spread throughout the ward and requiring transportation between operating rooms during surgery, and with non-ideally positioned technical equipment in the operating rooms. In the Attractive Work Questionnaire, the Physical Work Environment factor showed a discrepancy in how nurses assessed its significance for work attractiveness and how they rated it in their present work. As operating room nurses are responsible for the air quality and for ensuring that it does not jeopardise the sterile field, air quality was a concern within the work environment in Study I. In Study IV, nurses discussed how the air quality could be jeopardised when doors were opened and closed in order to transport technical equipment during ongoing surgery (Study IV, Andersson et al. 2012). Cleanliness of the premises was also considered to be important for work attractiveness (Studies II and III). In Study I, the cleanliness of the premises was discussed, and the nurses expressed their opinion that this kind of cleaning should be a work task for cleaners and not for nurses, as was currently the case. It is not surprising, when working in an area where a sterile field and clean premises are required in order to be able to perform surgery, that these items are considered important for work attractiveness. However, research linking deficiencies in the Physical Work Environment factor to nurse retention seems sparse and needs further investigation.

**Location: easy and rapid travel to and from work**
This factor is not investigated in relation to nurse retention. However, location was important for attractiveness of work. To spend time and effort in transporting oneself to and from work may be a factor further worsening work family conflict, i.e., the effort to combine paid work with family life. Chen et al. (2015) have shown a mediating role of work family conflict to job satisfaction and turnover intentions.

**Equipment: modern equipment and a reasonable physical and mental workload**
The factor equipment was considered important for work attractiveness (Study II). How the equipment affecting nurse retention in developed countries with modern health care are not studied to our knowledge. However, the findings both in Study I and IV indicate the importance of having the
right equipment in order to be able to perform the work expected and supplies of equipment close at hand.

Work content according to the Attractive Work Model

Three factors are present within the area of work content; Autonomy, Mental Work and Work Rate (Study II). None of these factors were assessed as being the most important for work attractiveness, nor did any of these factors have the largest discrepancy between how the nurses assessed its significance for work attractiveness and how they rated it in their present work (Study III). However, work content was assessed as being important enough to keep in the Attractive Work Questionnaire (Study II). Work content involves what employees do at work and how they perform their work (Åteg & Hedlund 2011), and this area was investigated in the qualitative Studies I and IV. In Study I, the nurses described how they organised and chose the way in which they would carry out their work tasks for the day. Thus, even though the operating schedule directed their work, the nurses had autonomy and influence in their work—which was assessed as important factors in work attractiveness (Studies II and III). Autonomy is included in the Magnet Recognition Program, and nurses’ opportunities to exert independent judgment in patient care and to work autonomously using their professional expertise are highlighted there (American Nurses Credentialing Centre 2014). Having influence and having control, as described in Study I, may be factors that buffer the impact of high job demands such as high productivity and work obstacles, as described in Study IV.

The attractive Mental Work factor includes the possibility to learn new things. This factor is separated from opportunities to develop in work, an item that is embedded in the Status factor in the Attractive Work Questionnaire (Studies II and III). Learning new things involves both clinical and theoretical learning (Åteg & Hedlund 2011). The Magnet Recognition Program promotes formal education and a continuous learning environment, suggesting a combination of theoretical and practical learning (American Nurses Credentialing Centre 2014, Kramer & Schmalenberg 2005). However, the nurses in Study 1 only discussed learning in clinical settings; theoretical learning did not seem to be something they considered. Learning new things and having the possibility to develop in work are both important factors for nurse retention. However, it is not always clear exactly what is included in these expressions (Carter & Tourangeau 2012, Hayes et al. 2012, van Dam et al. 2013).
Job satisfaction according to the Attractive Work Model

**Status: pride in what one does for a living, a sense that one’s work is important and one’s competence is in demand, positive, challenging and interesting work and work development**

The Status factor in the Attractive Work Questionnaire Status was assessed as being highly significant for work attractiveness (Studies II and III). The nursing shortage (Study IV) ought to be verification of the need for nurses’ competence and of the importance of their work. However, the nursing shortage and the demand for high productivity in operating departments may also lead to increased job strain, which in turn increases nurses’ intention to leave the nursing profession (Chiu et al. 2009, Hasselhorn et al. 2008). In a study by Arakelian et al. (2008) on efficiency in operating departments, having job satisfaction was understood to increase efficiency. In Study 1, nurses described developing at work and being challenged at work as necessities for gaining the professional knowledge of an operating room nurse. However, the nursing shortage may decrease nurses’ opportunities for positive challenges and development in work, because there are no stand-ins available to enable nurses to take time off for development activities such as educational programmes (Coventry et al. 2015). A lack of opportunities to develop in work has been shown to increase nurses’ intentions to leave (Hasselhorn et al. 2008, Hayes et al. 2012).

Attractive work and work engagement for nurses in operating departments

Attractive work and work engagement appear to be related in their focus on positive aspects of work. In Study IV, nurses’ work engagement was shown to increase nurse retention (Bargagliotti 2012, Carter & Tourangeau 2012). More specifically, work engagement mediates the relationship between good interpersonal relationships and turnover and mission fulfilment; that is, whether the organisation succeeds with its stated mission (Collini et al. 2015). However, it is notable that work engagement and burnout are considered to be related. In fact, experiencing a positive and energetic feeling of work engagement may become a risk factor for burnout (Halbesleben 2010), and burnout has been shown to predict an intention to leave (Estryn-Behar et al. 2007, Rudman et al. 2014).

Methodological considerations

The strength of this thesis lies in its use of different approaches, including both quantitative and qualitative methods. The methodological considerations
and trustworthiness of the qualitative studies (Studies I and IV) are discussed using the well-known concepts of credibility, conformability, dependability and transferability (Lincoln & Guba 1985, Polit & Beck 2008). Similarly, the rigor of the quantitative Studies II and III are discussed using well-known concepts such as objectivity, validity, reliability and generalisability (Polit & Beck 2008).

Methodological considerations for building trustworthiness into qualitative Studies I and IV

The discussion below follows the Quality Enhancement Strategies in Relation to Quality Criteria for Qualitative Inquiry (Polit & Beck 2008). Strategic key words taken from Polit and Beck’s work are in italics.

Credibility

*Credibility* is an overall aim in qualitative research and is reflected by the confidence of those who read the studies in the “truth” of the finding. In the data collection phase, *prolonged engagement* and *persistent observation* strengthen credibility. There were generous time limits for the data collection phase of Studies I and IV, and as the first author is an operating room nurse, the resulting in-depth knowledge of the group and context under study facilitated our understanding of the research area. However, this pre-understanding can also have a negative influence in terms of preventing an open mind on the subject. Using *audio-tape* in the interviews strengthened the *credibility* of this work. On the other hand, using audio-tape could make the interviewees feel uncomfortable and might result in their holding back information; in Studies I and IV, this somewhat stressed feeling passed after a short while. In Study I, there was strength both in conducting the interviews and in *verbatim transcribing* them in order to include non-verbal messages that emerged during the interviews. Non-verbal communication was not searched for in Study IV, as the interviewer strived for concrete descriptions of work.

The data analyses for both Studies I and IV were an interactive and close collaboration between the first author and the more experienced co-authors in the process of structuring, coding and categorising the findings; this collaboration strengthened the process. *Reflexivity* should be shown in documentation of prejudices and pre-understandings. As the first author had a deep knowledge of the studied context of operating departments while the other authors had more of a surface knowledge of this context, discussions evolved on pre-understandings in the analysis; however, these discussions were not documented.
Dependability

Dependability in a research study is achieved if findings are consistent and can be repeated.

Data triangulation refers to collecting data in different settings to test for cross-site consistency. Such data was obtained and strengthened Study I, as the data collection was from two different hospitals. Time triangulation involves collecting data of the subject under study (e.g., nurses’ work), at different times in order to determine the congruence of the studied aspects over time. A weakness of Study I and IV is that the studied aspects of nurses’ work may have varied over time. In Study IV, person triangulation (data collection from different people and levels such as individuals, groups or collectives) was achieved by collecting data from individual interviews with nurse managers as well as group interviews with specialist nurses and nurse assistants. The findings from the different interviews with the nurse anaesthetists, operating room nurses and the assistant nurses were largely grouped together and referred to in the analysis as findings for nurses. Despite the differences between these three nursing specialities there was great harmony between the nurses’ descriptions of work, so that separating the findings based on profession was not considered to be beneficial to the analysis.

Method triangulation involves using different methods for data collection. This is naturally imbedded into the case study method (Merriam 1998, Polit & Beck 2008, Yin 2009), which was used in Study IV, in which data collection came from interviews, written documents and extracts from the operating programme. Case studies often include observations, which we did not perform. Although observations could have added information regarding what nurses did and how they performed work tasks, the first author’s familiarity with the work in the operating department was felt to compensate for a lack of observations. Access to additional registered data was limited for the time of the study, as there were few systematic ways of keeping records in place at the operating department. Member checking was not formally done in Studies I and IV, but throughout the interview process, participants’ answers were summarised and retold by the interviewer so that corrections and additions could be made.

Conformability

Conformability refers to the objectivity or neutrality of the data and of the interpretations of the data. The analysis process in Study I and IV contained thorough discussions between all the authors on the topic of conformability. Peer review was achieved by letting PhD students and experienced researchers review the manuscripts in seminars. This was helpful in providing a “fresh look” at the data and interpretations. Conformability in the data coll-
lection for Study I was achieved by both authors listening to the first two interviews together. This process was to ensure that the first, inexperienced author, who conducted all the interviews, conducted them correctly. The experienced co-author advised the interviewer on how to further develop the interviewer role.

**Transferability**

Transferability is the way in which findings are applicable to other contexts. By providing a detailed description of the methods used, Studies I and IV provided readers with the ability to make decisions on how and to what extent to transfer the findings to similar contexts. Comprehensive field notes were taken during the data generation phase so as to be able to describe the context in which the interviews took place. However, these field notes could have been more structured in terms of what was to be included, in order to avoid bias by letting a pre-understanding of the field guide the notes. In Study I, data saturation was achieved by having both authors agree on the sufficient data collection. In Study IV, the data generation was structured in order to obtain concrete descriptions of nurses’ work. However, information may have been omitted in areas that were not asked for. For documentation of quality enhancement efforts, it is essential to include enough information in research so that the reader can value its trustworthiness. In both Studies I and IV, extensive efforts were made to give a comprehensive description in order to fulfil this task.

**Methodological considerations in building rigor into quantitative Studies II and III**

The original Attractive Work Questionnaire was developed using a methodology that included an inductive method of interviews inspired by grounded theory. Feedback and testing of the first version of the Attractive Work Questionnaire was conducted through a combination of interview findings with earlier research and theories. Finally, in order to generalise the model, a falsification test was performed by conducting interviews in the same way as when creating the model. The result supported the model in what was perceived as attractive work, regardless of work or profession, except for one limitation that was due to the possibility to generalise the model to self-employment (Åteg et al. 2004). In order to use the Attractive Work Questionnaire in a new context, a number of methodological steps in regards to validity and reliability were necessary. These steps are described below.

Rigor in quantitative research is built on objectivity, validity, reliability and generalisability. Throughout the analysis, objectivity was carefully consid-
ered in order to ensure that the findings originated from the data and not from the researchers’ personal opinions.

Validity refers to the degree to which an instrument measures what it is supposed to measure. Different types of validity exist, of which each obtained validity criteria increases the degree of validity (Polit & Beck 2008). In a data collection using questionnaires, there are always circumstances that may influence the measurements (Polit & Beck 2008). In Studies II and III, the participants were able to answer the questionnaire whenever and wherever was convenient to them. This flexibility was intended to decrease the possible negative impact of having the researchers present, and also reduced the risk of answering the questionnaire under negative environmental circumstances (e.g., being unable to sit undisturbed, or while feeling fatigued). Another aspect was to examine face validity: whether the items in a questionnaire “look” as though they are measuring the construct (Polit & Beck 2008). This examination was done by the authors; it was also considered by checking whether any item had a low answering rate that could indicate that the item was hard to understand or irrelevant. Missing answers varied between 2 and 10 on every item; together with the author’s examination of face validity, these features did not indicate low face validity.

To ensure content validation (Polit & Beck 2008, Streiner & Norman 2008), the authors examined the items in the questionnaire and kept all those that were appropriate for operating departments. To strengthen this part of the validation process, this examination of items could have been expanded by incorporating an expert panel of specialist and assistant nurses working in operating departments. Items covering the nurse-doctor relationship were not specified in the Attractive Work Questionnaire, as the Relationship factor already deals with unspecified relations at work. In the Practice Environment Scale of the Nursing Work Index (PES-NWI), a questionnaire used in several studies about nurse retention, the nurse-doctor relationship is included (Twigg & McCullough 2014, Warshawsky & Sullivan Havens 2011). Consequently, information may be lacking about the nurse-doctor relationship and how it affects work attractiveness.

The strategy for selecting the most prominent attractive qualities was based on how important each item was rated by the nurses. The chosen cut at the 80% level was not based on strong evidence, and if a different cut had been chosen, it could have had an impact on the result. Factor analysis is a construct validation that identifies clusters of items representing the same dimension that underlie the central construct (Polit & Beck 2008). In the factor analysis in Study II, the slightly low subject-to-item ratio in the area of working conditions made it necessary to stick to the original Attractive Work Questionnaire’s division into three areas and to calculate one factor analysis.
for each area. A bigger sample would have made it possible to calculate a factor analysis on the total number of items; such an analysis may have added insight and inspired possible changes in the structure. However, the factor analysis was for the most part in accordance with the original Attractive Work Questionnaire, which was considered to be satisfactory. The distribution of responses in the Attractive Work Questionnaire showed a positive skew towards the top of the scale: a ceiling effect (Streiner & Norman 2008). This effect is not unusual in questionnaires. However, with a positive skew it can be difficult to identify increasing values. The ceiling effect can be mitigated by shifting the centre (average) of the scale and adding more space at the positive end (Streiner & Norman 2008). However, since the Attractive Work Questionnaire is new in healthcare, additional data is required in order to determine what constitutes average scores.

Reliability refers to the degree to which an instrument (e.g., a questionnaire) is consistent in measuring what it is supposed to measure (Polit & Beck 2008). To test reliability, the internal consistency between the items in each factor was measured using Cronbach’s alpha. Cronbach’s alpha was found to be below the recommended 0.70 in four of the factors. This finding may indicate insufficient items in these factors and that items should be added in order to cover the underlying dimension of the factor. None of the factors exceeded the value 0.90, indicating that no items were redundant in measuring exactly the same thing (Streiner & Norman 2008, Tavakol & Dennick 2011).

Using the Attractive Work Questionnaire in healthcare required testing the association between attractive work and other concepts and factors that are known to impact nursing shortages and nurse retention. Work engagement was correlated with, and predicted, attractive work; this may seem logical, as both work engagement and attractive work are positive aspects of work (Bargagliotti 2012, Åteg & Hedlund 2011). However, since using the Attractive Work Questionnaire in healthcare is still unusual, its association to other concepts requires more research.

In order to be able to generalise the results from Studies II and III, some deteriorating concerns must be dealt with. The generalisability of these studies is strengthened by the consistency between the results from the Attractive Work Questionnaire and research results describing factors important in nurse retention: good relationships and teamwork, highly accessible leadership, influence in organisational governance, autonomy in decision-making and possibilities for development in work (Van den Heede et al. 2013, Lartey et al. 2013). Despite the limited sample size, the description of the sample includes satisfying demographic knowledge and knowledge of workplaces. The sample included nurses with different professions in operating
departments; however, there was nothing in the analysis to suggest significant differences between professions that would have influenced the results. Long employment at the current work did not indicate high turnover by the nurses in the sample; on the contrary, the nurses showed retention at work. It is unclear how this factor affected the findings. The four operating departments were of different sizes, representing both day surgery and on-call surgery during evenings and weekends (24-hour surgery). However, a larger sample size that includes nurses from different settings (different surgery specialities and different sizes of operating departments) and areas (cities and rural areas) is needed in order to be able to generalise these results to nurses in operating departments in general.
Conclusions

This thesis investigates specialist and assistant nurses’ work in operating departments and what these nurses experienced as attractive work. This research was done against the background of the current nursing shortage.

- Qualitative data from both individual and external perspectives gave comprehensive information regarding nurses’ work at operating departments in Sweden.

- Goal ambiguity and goal incongruence were found for specialist and assistant nurses and nurse managers in the case study at the operating department. The work prerequisites did not often enable the nurses to reach what they perceived to be their daily goal. Regular activities, such as acute and cancelled operations, were interpreted as obstacles in reaching the daily goal.

- Attractive factors for specialist and assistant nurses in operating departments were identified using the Attractive Work Questionnaire. The design of the questionnaire included assessments of how attractive the nurses’ current work was, as well as assessments of how important nurses considered the same factors to be for work attractiveness.

- Attractive factors that were identified by the specialist and assistant nurses were in the majority factors already known to be of importance in nurse retention. Additional factors that require more investigation are Equipment, Physical Work Environment and Location.

- Salary, Organisation and Physical Work Environment were shown to be factors that management should take under special consideration in seeking to improve working conditions and retain nurses in operating departments. These factors held the largest discrepancies between how they were rated in nurses’ current work and how important nurses considered them to be for work attractiveness.
• Relationship, Leadership and Status were the factors assessed by specialist and assistant nurses as the most significant for work attractiveness; these factors were also rated highly in how they corresponded to the nurses’ current work.

• Work engagement was associated with attractive work.
Clinical implications

The Attractive Work Questionnaire is useful in the effort to make work in operating departments attractive to nurses. The results from the Attractive Work Questionnaire, together with inspiration from the Magnet Recognition Program, can be a tool for management to use in practice. By looking for discrepancies between the importance of factors for work attractiveness and how these factors are rated by nurses in the present work situation, management can obtain clear directions regarding which areas to focus on. Work attractiveness is not something that can be reached once and for all. Rather, the effort to improve work attractiveness according to the factors that are assessed as being most important for attractive work should be an ongoing process by management.

The qualitative data gave explicit answers on how the environment posed obstacles to specialist and assistant nurses’ work at the operating department. This knowledge can be used to make improvements. Giving specialist nurses more influence over the operating schedule could improve logistics and provide important time for preparations before surgery. The goal incongruence found in the operating department needs clarifying. Specialist and assistant nurses’ goal was to finish the daily operation schedule without disturbance and with a good quality of patient care. This was an unrealistic goal due to the insufficient prerequisites and due to a regularly large number of acute and cancelled operations. In order for organisational goals to guide specialist and assistant nurses’ work in operating departments, these goals must be transformed into understandable, applicable goals and incorporated into nurses’ daily work. The goals must also be framed in such a way that makes them possible to evaluate.
Svensk sammanfattning (Swedish summary)


Det övergripande syftet med avhandlingen var att få kunskap om specialistersjuksköterskors och undersköterskors arbete på operationsavdelningar samt vilka faktorer som de anser vara viktiga för ett attraktivt arbete.

I Studie I var syftet att beskriva operationssjuksköterskors uppfattning om arbetet utifrån deras eget perspektiv, 15 operationssjuksköterskor, verkamma vid två sjukhus intervjuades. Tre aspekter av fenomenet ”operationssjukköterskans arbete” framträdde. Aspekterna var; ”Att uppnå kontroll över situationen genom att ha framförhållning och ligga steget före”, ”Möjligheten till gott samarbete sker genom att vara uppmärksam på uttalade och outtalade önskemål och behov hos patienten och hos alla medlemmar i operationsteamet, framför allt kirurgen”, och ”Genom att medverka vid många operationer utvecklas operationssjuksköterskan inom sitt yrke”.

I Studie II var syftet att anpassa och testa enkäten ”Attraaktivt arbete” för användning inom hälso- och sjukvård för specialistersjuksköterskor och undersköterskor på operationsavdelningar samt att identifiera viktiga faktorer för arbetets attraktivitet. Syftet i Studie III var att undersöka skillnaderna mellan hur viktiga olika faktorer skattades för arbetets attraktivitet samt hur attraktiva dessa faktorer skattades i det nuvarande arbetet. Syftet var även att undersöka samband mellan ålder, kön, anställningstid, arbetsengagemang, arbetsförmåga, självsattad hälsa och attraktivt arbete.

I Studie IV var syftet att beskriva hur chefer, specialistsjuksköterskor och undersköterskor tolkade organisatoriska och dagliga mål, samt förutsättningarna för att utföra arbetsuppgifter och nå uppsatta mål i det dagliga arbetet. Studien omfattade verksamheten vid centraloperation på ett länsjukhus. Datainsamlingen bestod av enskilda intervjuer med länsverksamhetschefen och vårdenhetscheferna och grup pintervjuer med specialistsjuksköterskor och undersköterskor samt av måldokument och statistik över antalet plant rade, akuta och inställda operationer. Den intervju metod som användes var ARIA-Arbesinnehållsanalys. Resultatet i Studie IV visar att det dagliga operationsprogrammet, inte de organisatoriska målen, styrde arbetet. Operationsprogrammet var ofta för optimistiskt planerat, och sjuksköterskorna hade inte mycket inflytande över programmet. Dessutom förekom dagliga förändringar i programmet bestående av akuta och inställda operationer. Detta sågs som hinder i arbetet och det var vanligt att hastig igenom operationsförberedelserna instället för att lugnt kunna förbereda nästa operation. Lokalerna på operationsavdelningen sågs också som hinder i arbetet, med alltför små förråd och material som förvarades på olika ställen över hela operationsavdelningen, vilket ledde till sämre framkomlighet, och innebar att det tog
längre tid att hitta den utrustning som behövdes. Bristen på specialistsjuk-
sköterskor innebar extra belastning för personalen och sågs som ett hinder i
arbetet.

Slutsatser och implikationer
Beskrivningarna av specialistsjuksköterskors och undersköterskors arbete på
operationsavdelningar samt enkäten ”Attraktiv arbete” gav värdefull och
tydlig information om vad som styr arbetet på en operationsavdelning, hin-
der i arbetet samt vilka faktorer i arbetet som är viktiga för arbetes attraktivi-
tet.

Relationer, Ledarskap och Status bedömdes som mest viktiga för arbetets
attraktivitet, dessa faktorer bedömdes också vara attraktiva i det nuvarande
arbetet. Eftersom attraktivt arbete inte är något som uppnås en gång för alla
behöver ledningen sträva mot ständiga förbättringar inom dessa faktorer för
att bibehålla attraktiviteten. Den största skillnaden mellan hur attraktiv en
faktor bedömdes samt hur detta överensstämde med attraktiviteten i nuva-
rande arbete var Lönen, Organisationen och den Fysiska arbetsmiljön. Detta
ger en tydlig indikation till ledningen om att det behövs förbättringar inom
dessa faktorer för att arbetet ska uppfattas mer attraktivt. Attraktiva faktorer
som inte tidigare undersökt i förhållande till sjuksköterskebrist, och därför
behöver undersökas ytterligare, var Utrustning, Fysisk arbetsmiljö och Ar-
betsplatsens lokalisation.

Om de organisatoriska målen ska guida specialistsjuksköterskornas och un-
dersköterskornas arbete behöver dessa bli anpassade och integrerade i det
dagliga arbetet samt möjliga att utvärdera. På operationsavdelningen var det
operationsprogrammet som styrdde specialistsjuksköterskornas och underskö-
terskornas arbete. Att dagligen slutföra operationsprogrammet var dock ett
orealistiskt mål med tanke på de givna förutsättningarna: ett för optimistiskt
(tidsmässigt) planerat operationsprogram, störningar i operationsprogrammet
(akuta och inställda operationer), den fysiska arbetsmiljön samt bristen på
sjuksköterskor. Ett sätt att öka specialistsjuksköterskornas inflytande, vilket
är viktigt för arbetets attraktivitet, skulle kunna vara att ge specialistsjukskö-
terskorna inflytande över operationsprogrammet och genom detta bättre an-
passa programmet efter givna förutsättningar och ge tid för förberedelser
inför operationen.

Förbättringar inom faktorerna: Lönn, Organisation och Fysisk arbetsmiljö,
förtylgandet om vad som ska styra arbetet, samt att öka specialistsjukskö-
terskors och undersköterskors inflytande i arbetet kan vara åtgärder som
leder till ökad attraktivitet och i och med det ett sätt att behålla specialist-
sjuksköterskor i arbetet på operationsavdelningar.
Acknowledgements

It would not have been possible to fulfil this thesis without help and encouragement from many people, and I thank you all. If I think of myself as a drop in the flood of life, all of you are the other drops that have kept me floating.

En droppe droppad i livets älv
har ingen kraft till att flyta själv
Det ställs ett krav på varenda droppe:
Hjälp till att hålla de andra oppe!
Tage Danielsson
Postilla: 52 profana predikningar och betraktelser (1 uppl. 1965)

I would especially like to thank:

All the study participants: The specialist nurses, nurse assistants and nurse managers who generously shared their experiences, knowledge and time, and thereby made this thesis possible.

Malin Josephson, my main supervisor: With great kindness and loads of patience, you guided me in the journey to become a PhD. With calmness and trust, you encouraged me by providing exactly the right amount of challenges for me to develop my research knowledge. You have always been available and quick to respond, willingly sharing your experience and making me express myself in a way that is understandable to others. You also helped me to see the world from many perspectives. I appreciated the great respect for my work time with other tasks, such as clinical work in the operating department and supervising nurse students. I feel lucky to have had you as my main supervisor.

Barbro Wadensten, my co-supervisor: You were a strong support at the department of Public Health and Caring Sciences in Uppsala. Thank you for reviewing my writing with “new eyes”. You always made sure that I had the right information, understanding the difficulties of being a doctoral student at a distance. You encouraged me to take part in valuable activities at Uppsala, such as doctoral seminars. I am grateful that you always made sure I was welcome at Uppsala.
Dag Rissén, my co-supervisor: You were my support at the Centre for Research & Development, Uppsala University/County Council of Gävleborg (CFUG). With your good attitude, you were always willing to support and lift me during hard times. You were the perfect reviewer, always finding things that slipped my mind and mistakes in my writing. I will miss the humorous chitchats during our enjoyable coffee breaks.

Eva Lindberg Boström, my supervisor and co-writer in Study I: It was you who put me on this track, although I had thought of doctoral studies as being unreachable for me. If you hadn’t believed in me and introduced me to the scientific world, this thesis would never had happened.

Magnus Lindberg, co-writer in Study III: Thank you so much for contributing with your knowledge.

All former managers (verksamhetschefer) at the operating department: Kjell Karlsson, who gave the first permission for my doctoral studies; Lars-Åke Berndalen and John Mälstam, who continued to believe in me; and my present manager who provided trust and support, Johnny Hillgren; thank you all.

My former managers (vårdenhetschefer) at the operating department: Lotta Sundberg, Miska Hibner, Eva Lassander, Liza Nordström Partanen and my present manager, Tove Söderström—thank you for giving me the best opportunities to combine the enjoyable work at the operating department with my doctoral studies.

To all personnel at CFUG: The spirit of the department has always been supportive, and you meet every individual’s needs with the best possible assistance. We doctoral students develop by having fun at coffee breaks and a relaxed and open atmosphere. Marieann Högman, former head of the department: You arranged and made my doctoral studies possible; I am most grateful for that. Katarina Wijk, head of the department: You came along at the completion of this thesis and have in a short time been most supportive, not least in future planning. Thank you so much for that. Lennart Fredriks-son, research advisor: You were always supportive, especially in the finishing of this thesis; thank you. Hans Högberg, former statistician, and Per Liv, statistician: Thank you for your invaluable support and discussions that helped me to understand a little bit of the world of statistics. It is a wonder that you did not break down under all my “stupid questions”, with me forgetting what you had just told me. I hope to be able to consult you in the future. Inga-Lill Stenlund: You were always service minded and gave everything you had to support me in every possible matter. Maria Lindh: You are taking on the mission to continue in the same spirit, and I’m most grateful.
To my roommates throughout the years at CFUG—Magnus Lindberg:
You were the experienced doctoral student when I first entered the room. You gave me the best start and you never seemed to get tired of all my questions. You supported me in learning how to supervise students and you made me join the EANS summer school, which became a really good learning ground and a source of good friends. It was also enjoyable to discuss house-restoration projects with you. I’m most grateful for all your help. Maria Lindberg: Thank you for sharing your knowledge with me; you broadened my view on research. It was really enjoyable to go to the EANS summer school with you. I give you special thanks for your support in how to supervise students and for reading my second manuscript and giving me advice. Eva Sving: Is there anything we don’t laugh about? I don't think so. I’m so happy I made friends with you and I love discussing everything in life with you; you are such a wise person. Aside from the laughter, you were the one who listened to my difficulties when I went through the borrelia infection. Thanks for keeping me upright. You also gave helpful advice on Study IV. Kristina Vroland Nordstrand: Thank you for your lovely company and for the discussions in the new room. It was such good thing, having you do your thesis just before me, although you left a big vacuum when you finished. Thank you for helping me, especially with making the tables and figures understandable. To all other former and present doctoral students at CFUG: You gave great advice and provided many enjoyable breaks in my writing.

To all former and present doctoral students and senior researchers at the Department of Public Health and Caring Sciences in Uppsala: You all contributed to my development in learning more about aspects of writing, methodological issues and interpretation of findings through our doctoral seminars. Thank you all for giving your time and sharing your knowledge.

To all former and present colleges at the operating department: Thank you for your support in my doctoral studies and for allowing me to be one in the team even though I was often “new at the job”. I really love the mix of fun and serious, highly skilled work that we have in the operating department. It’s been great to take time off from my doctoral studies to work with you.

Kerstin Waldenström, who developed the ARIA used in Study IV: Thank you for introducing me to the methodology.

Ann Hedlund, with the research team at Högskolan Dalarna: Thank you for your interest in my doctoral studies and for generously letting us use the Attractive Work Questionnaire.
The Department of Occupational and Environmental Medicine, Medical Sciences, Uppsala University: Thank you for your assistance with data collection in Studies II and III.

Lars Elfving and Ingrid Halvarsson: Thank you for assisting with information from the operating programme.

Annika Nilsson and UllaKarin Ivarsson, my supervisors in writing my “c-uppsats”: You took on your mission with such enthusiasm and joy that it inspired me to carry on to the “d-uppsats”. Furthermore, Annika, you took me on as a co-writer in two studies in addition to this thesis; I’m so grateful for this opportunity to learn more, and I have enjoyed our meetings.

To my close family:
Albin, Beatrice and Cornelia: You have been and will forever be the light and love in my life. Whenever I think of you it reminds me of the most important thing in my life—you.

Percy, my dear husband, my love and my very best friend: I could not have done this without you. Thank you for being you, always by my side. We have such fun together, sharing life. Every moment with you is precious.

My mother and late father: You always made me feel loved; that is the very best gift. I love you.

My sister Sussi: Thank you for always being there when needed and for reminding me of a life outside my doctoral studies.

This thesis was supported by funding from the Centre for Research & Development, Uppsala University/County Council of Gävleborg.


Gillespie BM & Hamlin L (2009): A synthesis of the literature on "competence" as it applies to perioperative nursing. AORN J 90, 245-258.
International Council of Nurses Code of Ethics [in Swedish].


The Swedish Society of Nursing (2011): Kompetensbeskrivning för legitimerad sjuksköterska med specialistsjuksköterskeexamen med inriktning mot operationssjukvård [Description of competence for Registered Nurse with Graduate Diploma in Specialist Nursing - Operating Room Nursing Competence].


A doctoral dissertation from the Faculty of Medicine, Uppsala University, is usually a summary of a number of papers. A few copies of the complete dissertation are kept at major Swedish research libraries, while the summary alone is distributed internationally through the series Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Medicine. (Prior to January, 2005, the series was published under the title “Comprehensive Summaries of Uppsala Dissertations from the Faculty of Medicine”.)