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**A GOOD LEARNING ENVIRONMENT
FOR NURSING STUDENTS IN PRIMARY
HEALTH CARE**

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Institutet**

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In memory of my dear father Anders Finn (1922-2005), who grew up under very poor circumstances in the 1920s. He never had opportunities to study and had to work hard for his livelihood. He always stood up for me—regardless of the problem. My parents believed in me when I decided to enter higher education. Thanks Mom and Dad!

If there were only one truth, you couldn't paint a hundred canvases on the same theme.
(Pablo Picasso, 1966).

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ABSTRACT

Background: Clinical learning is a key part for developing nursing and caring skills during nursing education. Previous studies concentrated on hospitals as placement sites. Research results reported in this dissertation identify factors that encourage good learning environments in primary health care (PHC) placements.

Aims and methods: The overall aim of the present research was to identify factors that promote good clinical learning environments in PHC settings. Clinical learning environment was investigated from students' and supervisors' perspectives and their perceptions of the clinical part of nursing education in PHC settings. The present research implemented three quantitative studies (I, II, III) and one qualitative study (IV). In study I investigated district nurses' (DNs') student supervision experiences in PHC units before and after implementation of a new supervision model; 98 of 133 DN (74%) responded to a questionnaire *before* and 84 (65%) responded *after* implementation. In study II validated the *Clinical Learning Environment, Supervision, and Nurse Teacher* (CLES+T) scale. In study III investigated students' motivation, total satisfaction, and experience of professional role models associated with dimensions in clinical learning environments. In studies II and III collected data from undergraduate nursing students (n=356) using the CLES+T scale. In study IV interviewed six focus groups with 24 supervisors (DNs); these data provided understanding of student supervision in PHC units.

Results: **Study I** revealed significant need for a new supervision model in PHC units. Supervisors had difficulties staying updated on changes in nursing curricula and experienced insufficient support from universities. They felt that they had to set aside time from their regular duties and get permission from unit managers to supervise students. The supervisors felt confident in the supervisory role, but few had formal educational and academic credentials. After the new supervision model implementation, several supervisors were more satisfied with the supervision organization. The model implementation resulted in improvements within PHC units.

Study II confirmed good internal reliability in the CLES+T scale and demonstrated that the five-factor model within the scale is the best-fit model. Supervisory relationship was the most important factor and it strongly correlated with these factors: (i) pedagogical atmosphere and (ii) premises of nursing. Supervisory relationship was moderately correlated with the role of the nurse teacher, and leadership style correlated with PHC units.

Study III revealed a statistically significant association between (i) students' motivation, total satisfaction, and experiences of professional role models and (ii) five dimensions of clinical learning environments. The satisfaction factor had a statistically significant association (effect size was high) with the dimensions; this clearly indicated that students experienced satisfaction. Supervisory relationship and pedagogical atmosphere particularly influenced students' satisfaction and motivation.

Study IV revealed three themes related to supervisors' experiences during student supervision in PHC units: abandonment, ambivalence, and sharing the holistic approach. Supervisors felt abandoned by their managers, colleagues, and nurse teachers from universities. They were proud to be DN and willing to share experiences with students – yet torn between being students' supervisors and patients' nurses.

Conclusion: This dissertation reports six main factors for good learning environments in PHC units. Supervisors must be prepared and engaged, and students must be motivated. A close, reflective supervisory relationship is one of the most important factors for learning in PHC units. Successful supervision requires clear structure and organization. Adequate support and resources from PHC units are needed for supervisors. Collaboration and liaison between universities and PHC units are needed to link theoretical and practical parts of nurse education. PHC-unit circumstances contribute to holistic nursing care, which is an important factor for student learning. Furthermore, the CLES+T scale was shown to be a reliable tool to use for evaluating PHC settings as clinical learning environment.

Keyword: Clinical learning environment, Supervisor, Nursing student, Primary health care

LIST OF PUBLICATIONS

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Abbreviations and definitions

CeFAM	Centre for Family Medicine
CLES+T	<i>Clinical Learning Environment, Supervision and Nurse Teacher</i> scale
DN	District nurse
NS	Nursing student
PHC	Primary health care
PHC unit	One district's centre including patient care in primary health care centre and home care
RN	Registered nurse

Terminology

Clinical teacher	An employee in a PHC unit that's connected with nursing programs at universities and acts as a link between universities and a PHC unit to support students and supervisors
Main supervisor	District nurse with primary responsibility for all nursing students in one unit
Nurse teacher	A formally educated person – employed by a university's nursing education department – who responsible for theoretical and clinical teaching. This person supports and guides clinical teachers and supervisors who contribute to student's overall experiences during practice
Supervision	Process that contains interaction between two people, where theory and practice are placed in a professional context and involves relationships and interactions between students and clinical staff members
Supervisor	District nurse or registered nurse working in PHC units and supervising nursing students

PREFACE

I acquired extensive experience in supervising nursing students, first as a registered nurse (RN) in various hospital wards and then as a district nurse (DN) in the primary health care (PHC) units. In 2003, I was given an opportunity to work as a clinical teacher at the Centre for Community Medicine (CeFAM); the purpose of the position was to meet with students and their supervisors and support them in PHC units in southern Stockholm.

In 2008, I received an opportunity to work as a part-time nurse teacher at the Red Cross University; here, I was responsible for theoretical and clinical teaching that enabled students to achieve learning outcomes during PHC placements that are part of the nursing program. I introduced students to the course before their placements and supported them during their four- week placement in PHC units. I also provided support and guidance to their supervisors during that time. By listening to students and supervisors, I clearly understood that PHC units – as learning environments – were far from optimal. Learning prerequisites could vary extensively among the PHC units – and even within the same unit during different periods. The atmosphere in PHC units and pedagogical encounters with students, supervisors, ward managers, and other staff members in PHC units varied. I wanted to find out what prerequisites are necessary for student learning within PHC units. How do students and their supervisors experience PHC units as clinical learning environments? How students and supervisors experiences interact with each other? With other staff members? With nurse teachers at universities? What kinds of factors can complicate or promote student learning in PHC units? What factors complicate supervisors from supervising students in PHC settings? What factors promote supervision? Many factors had to be accounted for and many persons were involved. My curiosity regarding how good clinical learning environments in PHC units should be understood and described became the starting point of my research project.

1 INTRODUCTION

This research project focused on students' and supervisors' experiences of primary health care (PHC) units as clinical learning environments. The general aim was to understand prerequisites for students learning to become nurses and supervisors' opportunities for supervision. Learning and supervising requires good learning environments. To understand and describe the *good*, it's essential to uncover and understand students' and supervisors' experiences and to find an instrument for evaluating clinical learning environments. The *Clinical Learning Environment, Supervision, and Nurse Teacher (CLES+T)* scale, which can be used in research and quality assessments of clinical learning environments, was developed and validated for in-patient hospital care. Valid instruments are also necessary for evaluating PHC units as clinical learning environments.

A clinical learning environment is very complex and consists of various factors that are important for learning, for example: type of learning culture, learning atmosphere, supervisory relationship, how supervision is organized, and prerequisites for nursing care. Clinical placement in a clinical learning environment is one of the key components in nursing education; it facilitates work-based learning with focus on patients' care. Students have opportunities to apply theoretical knowledge by caring for patients in real life situations [1]. Clinical placements also offer situations in which students meet and observe qualified nurses (supervisors) who reflect on the profession for future nurses.

Nurse education

Nursing program is a practice-focused education that has undergone some major changes in the last three decades and has emerged from vocational training to a university degree (plus vocational training) in many European countries [2]. This nursing education transition has been challenging – and not without problems [3]. Since 1993, nursing education in Sweden could lead to a Bachelor of Science degree in nursing – after completing a three-year nursing program. The academic requirements involved theoretical knowledge and clinical practice experiences – distributed about evenly. Another transition that took place was the way in which learning was understood. Previously, students were passive objects who received instruction and

information. Today, they take active roles and assume responsibility for learning the requisite knowledge. Teachers are no longer considered to be persons who transmit knowledge and exercise control. Instead, they serve as facilitators who guide learning processes. Swedish nursing education encourages students' independence, critical thinking, and decision-making. And students must assume responsibility for their studies [4, 5]. To meet these increasing requirements, it is crucial for students to acquire a broad knowledge base on the run-up to the day when they receive degrees and start working as professional nurses [6].

Most international interest has been on the academic level of nursing education, and clinical placement in education has not received the same attention. Gaps between these two key components must be filled. Clinical placements in PHC settings as learning environments are viewed as vital and have received increased attention in the last decade [7]. The current European trend in health care is to increasingly move patient care away from traditional hospital settings – to home care and health care centres in PHC settings. Hospital care has become more high-tech, with increased costs. Subsequently, an increasingly aging population and few hospital beds led to patients having to receive care at home. This brings new challenges for future nurses and other health- and medical-care professionals – to meet patients' increasing needs outside hospitals [7, 8].

Unfortunately, most nursing education studies focus on hospital settings as clinical learning environments. Little is known about PHC units as learning environments and in particular, about supervisors' and students' experiences. So the purpose of the present research was to identify factors that promote PHC units as good learning environments – by describing students' and supervisors' experiences.

2 BACKGROUND

2.1 CLINICAL LEARNING ENVIRONMENT

As emphasized by previous research, clinical learning – part of nursing education – is a significant arena for acquiring nursing and caring skills. *European directive 2005/36/EC* [9] specifies length of nursing education and minimum theoretical and practical training levels. Several universities offer a combination of short and long placements during nursing education. Clinical learning opportunities vary; consequently, this is an issue of national and international interest. Current growing demand for good placements exceeds supply, and universities usually compete for these placements [7, 10].

As per the *European coordination directive 77/453/EEG*, students must spend at least half of their education in clinical environments. Nursing education has always been closely linked with diverse clinical environments in which students have direct contact with patients and their relatives [11]. Clinical placements most often occur in hospitals – as well as nursing homes, retirement homes, palliative care units, maternity and pediatric units, schools, and PHC settings, among others. Students must get varying experiences from various types of clinical placements – to gain comprehensive understanding of what nursing involves. These experiences facilitate the transition from student nurse to professional nurse. Because placements are in real life situations (patient-care settings), they have opportunities to learn the profession.

Clinical learning environments are multifaceted; they are often fast-changing and sometimes very unpredictable. Multifaceted environments embrace all psychological, social, and cultural factors that influence clinical learning experiences. These environments contain everything that surrounds students – patients and their families and friends, staff members, supervisors, and equipment. Nursing care content and quality are critical success factors for achieving meaningful learning experiences in clinical learning environments [12, 13]. The environments vary regarding focus on conditions for students' learning activities, ways in which students experience the atmosphere within a specific setting, students relationships with supervisors, ways in which students describe ward managers' roles, and ways in which managers create a positive atmosphere among nursing staff [13-15].

The literature describes the importance of providing good clinical environments and of improving learning; here, focus is on students' opportunities to integrate theory with practical skills [16]. Consequently, supervisors must be interested in supervision and must possess aptitude/capabilities to be able to supervise students, support them, provide feedback, and enable opportunities for students to reflect on learning situations [17]. Besides the aforementioned facets, collaboration and cooperation with other health care professionals also constitute part of clinical learning environments. All staff members play a role in students' learning. Technology trends and patients' short hospital stays, however, create complexity and challenges when it comes to learning [18].

Previous studies show that clinical environments offer a lot of stimuli – often via unplanned activities with patients; these stimuli and activities can trigger stress and make it difficult for students to sort through what is essential [18, 19]. Unsatisfactory experiences in earlier clinical placements could affect students' expectations for new clinical placements and increase their anxiety levels [20].

Regarding integration of theory and practice, Jonsen et al. [21] and Lindberg et al. [22] report that the main objective for students is to apply theoretical knowledge in practice; this, in turn, provides opportunities to give staff members in various settings access to new research. Integrating theory with practical skills involves implementation of research findings and [23] development of evidence-based practice guidelines – two of many effective tools for improving patient-care quality. Staff nurses and supervisors are responsible for implementing the latest research, i.e., putting it into practice. They play a key role in supporting students and implementing the research; unfortunately, studies indicate that research-results implementation is not visible in daily practice. In part, this is probably because nurses who were educated in vocational training programs – rather than academic programs – do not see the importance of higher education for new nurses and perhaps reject the academic content of nursing education.

It is important to continually evaluate clinical learning environments to ensure optimal clinical placement and optimal prerequisites for students' learning. Results from evaluations facilitate development of new nursing education content. During clinical learning environment evaluations, assessors must account for students' and supervisors' opinions and experiences regarding these environments. Several instruments were

developed and validated to evaluate clinical learning environment quality; these instruments have been used nationally and internationally in universities; approaches to their implementation vary from country to country [14, 15, 24-28]. For example, Chan's [23] *Clinical Learning Environment Inventory* (CLEI) evaluates nursing students' perceptions of psychosocial characteristics within clinical learning environments during their hospital placements.

2.1.1 Primary health care units as clinical learning environment

The present research examined clinical learning environments from the perspective of PHC. Clinical placement in PHC units offers students many varying experiences and learning situations – in encounters with patients and their relatives in homes, work situations, and other settings within society. Sweden's PHC units focus on supporting and caring for individuals and populations of all ages (cradle-to-grave) within an area/district in one community. This focus requires staff members who have comprehensive knowledge about inhabitants' physical, psychosocial, and spiritual needs [29]. PHC is the first level of contact of individuals and families with the national health- and medical care system and constitutes the first element of a continuing health care process. It brings health care as close as possible to where inhabitants live and daily work [30].

PHC is a key concept within the entire health- and medical-care system. PHC addresses inhabitants' various health problems and diseases. Besides providing basic medical treatment, PHC units offer preventive, curative, and rehabilitative services to everyone in the community [31]. District nurses (DNs) often work with health promotion projects that cover issues such as lifestyle changes, exercise and fitness, healthy eating, and general health and well-being [32]. In most European countries, the age 60+ population is skyrocketing. Forecasts indicate that the number of persons age 65+ will nearly double between 2010 and 2050 [33]. Further health- and medical-care will be needed outside of hospitals – due to the increased number of care-dependent older persons in many countries [30]. European health- and medical-care services will be increasingly focused on patients with chronic diseases, because older persons are more likely to have chronic and often multiple health and medical problems. Consequently, they are vulnerable, which necessitates ongoing preventive care, well-controlled conditions for managing disease, and rehabilitation. Due to increasing financial costs worldwide, this new situation triggers new ways of thinking. PHC, which has

responsibility for an ever-increasing aging population, also has responsibility for health promotion, which is an important part of nursing care within the PHC system. Health promotion has potential to facilitate healthy aging and inhibit, moderate, and prevent many late-life health problems and diseases [32]. The World Health Organization captured the importance of preventing increased chronic disease development: “All countries, therefore, need to develop sustainable systems of chronic care that ensure high quality, safe care beyond the hospital setting”[33].

Organization and DNs work in primary health care

In Sweden, PHC units are organized under the auspices of 20 county councils. Each council is responsible for health and medical care for inhabitants of all ages within its geographic area. Each county delivers clinical placements in hospitals and in PHC units for nursing education [34]. PHC employ DNs, RNs, family physicians and other health- and medical-care personnel. Inhabitants are offered care in PHC settings or in their homes. Patients can seek care within PHC settings without referrals. Consequently, staff members cannot preplan patients’ health- and medical-care process stage that requires fundamental investigation and assessment of patients’ health – to give appropriate care and treatments. DNs evaluate patients’ health care problems, who for various health reasons, cannot visit PHC centres and are enrolled in home care, which requires a holistic approach concerning patients’ health care needs. Patients with chronic diseases often have complex care requirements; this, in turn, requires collaboration with other caregivers such as physiotherapists and occupational therapists [35].

DNs in Sweden are certified (registered) nurses who completed specialist training after initial certification. DNs work independently – usually in a geographic area and in collaboration with other caregivers such as physicians who have main responsibility for patients using a holistic approach [36].

The work of DNs focuses on the nursing care of individuals and widely on disease prevention and health promotion. DNs identify patients’ physical, psychological and social health conditions and problems and assess, plan, implement and evaluate appropriate nursing interventions. DNs meet patients and their families and often establish close, long-term relationships with patients in the home care programs [37].

Visiting patients in their homes is a privilege and unique setting for DNs and an important in the process of achieving a holistic view of the patients and their individual health conditions [36]. To enter patient' home and his/her "world and rules" is a caring situation in which DNs are challenged to find ways to establish trust, maintain confidentiality and preserve supportive relationships with patients and their families [38]. Working conditions are not always the most ideally. Many DNs stress difficulties such as a lack of continuity of patients care when the daily working includes tasks as telephone counselling and several short home visits [39].

PHC are organized in various ways worldwide. For example, in some countries, instead of the *district nurse* (DN) title, nurses are called *health visitors* and *practice nurses*, who work with family practitioners. These nurses work more independently and cooperate with health care assistants who do work previously done by these nurses [40, 41]. In the UK district nurses or *community nurses* provide nursing care primarily in the homes. In Norway and Ireland PHC settings are organized into prevention units, health promotion units, and disease-based care units [42]. In New Zealand, Canada, and the US, multidisciplinary teams or nurses and volunteers deliver home care and visit patients [7] .

2.1.2 Learning in clinical learning environments

Nursing is a practice oriented profession, where teaching and learning in universities are combined with teaching and learning in clinical environments. Today, theories of learning focusing of student activity and knowledge is created by student's learning activity, students take responsibility for their own learning [43].

PHC as a clinical learning environment constitute a natural part of nursing education. Students can get opportunities to meet patients and their relatives within the PHC settings to gain insight into the importance of families most often, with supervisors on home visits [7, 44]. When students first arrive in PHC units, it is common that they don't totally understand how, why, and what they will learn during the placement. When they enter a nursing education program, they often have an inner picture of what nurses should think, do, and say. Clinical learning environments are complex – so much so that they may affect all the senses that are engaged during clinical education. Students cannot control what happens in PHC units and that raises new thoughts and feelings that students must reflect over [45, 46]. So supervisors are needed – persons

who can see things from students' perspectives and offer the requisite patience that enables students to feel safe and secure in the learning situation. It's crucial not only for supervisors but for all staff members in PHC units to find strategies for students' learning, ways in which learning should be organized, and ways in which information and understanding of learning activities and learning outcomes can be assessed [11].

Interaction

Interaction is a crucial factor for learning. Compared to classroom settings, learning in clinical environments occurs within a complex social context that embraces ways in which students are involved and interact with patients, supervisors and other staff members while learning activities occur [47].

From students' perspectives, essential in the learning is to interact with patients and their relatives. Students have opportunities to take an interest in patients' situation and establish an ongoing dialogue with them. Interaction with staff members is another crucial element in learning. Ways in which staff members interact with students and even ways in which students interact with other students are important aspects in learning process. Many factors may affect clinical environments in positive and negative directions that often are related to interaction between a student and a supervisor [16, 48, 49].

Consequently, students must learn and experience how they affect others through their behavior and how they can interact in these encounters applying knowledge and training practical skills. This awareness develops a professional identity. New knowledge integration is a psychological process that emerges from their nursing care experiences – when they independently discover and solve problems – based on their individual needs [50]. According to Felstead [51], learning is simultaneously an interaction process and an internal process all aspects of learning environments influence students. These factors affected students' sense of being prepared for transition from the student role into the professional nurse role: perceptions, degree of initiative for learning, and perceptions of various role models, and a variety of learning environments – the sum total of all their experiences. Initially, nurses are students' role models during practice, and the nurses' behavior might affect who students choose as a role model. Stages within the students' socialization process are not “taught” by mentors, so it's to be expected that students will just mimic prevailing workplace-

culture rules that are demonstrated by staff members' behavior. However, the issue of whether or not staff members have the ability and capacity to model behavior for students.

By observing how others are doing or performing tasks is also a learning opportunity [52]. According to Bandura [53] modeling is central in the master-apprenticeship model. It's necessary for transmitting current attitudes, values, and even different patterns of thought and behavior and modeling. Nasrin et al. [54] recently reported that students observe supervisors to be good role models. If students can share in direct patient care, then they are motivated to become nurses. If a nurse as a role model demonstrated respect and human kindness toward patients – and this nurse becomes an appropriate model for students – then students get valuable insight into their future profession and ways in which they want to care for patients. By observing how others are doing or performing tasks is also a learning opportunity. If two students are working in tandem, then they learn by observing each other in action [55].

Students follow examples demonstrated by several persons to build their professional identities. Supervisors frequently leverage their awareness of being a role model for students in clinical practice. Holmlund et al.[56], reports that development among students – from having more focus on observing nurses to having a more profession-centered focus – occurred by taking more responsibility in clinical placement. But this learning perspective is insufficient for meeting today's increased academic education demands – because some nurses, who will be role models for students, do not have the same academic knowledge required to support students. This can cause problems for learning because at the same time, the ward must serve as a good learning environment in which the main focus is on providing good patient care.

So if supervisors focus on tasks to be performed – rather than on where each student is in the learning process – it can easily become a master-apprenticeship situation in which the student mimics the supervisor and learning takes a back seat to the assigned tasks. Students become observers and are not well-prepared and involved in situations. But when students meet and discuss things with other students and nurse teachers, awareness of *what nursing means* evolves [57].

One learning-critical factor is students' well-being when it comes to their sense of belonging to the health care unit [58]. It is important that students have a sense of belonging because they often feel very exposed and vulnerable, especially at the start of clinical placement. Exposure and vulnerability generally results in students feeling uncomfortable and assuming a more observational role [16]. A sense of belonging occurs if supervisors trust students to perform tasks in direct patient care, to caring patients independently yet supervisors support them. Students feel that supervisors focus on their self-learning [59]. A sense of belonging is a prerequisite for learning. Feeling part of a team at the start of a clinical period makes students feel immediately accepted by the staff [11]. Belonging to the teams assist students to reflect learning activities fitting into a social context. Bandura reports that socialization is a process in which a person learns prevailing norms and values in society, in education programs, or in the workplace [60].

According to Schön [61] the turning points in learning can be increased awareness when theoretical knowledge integrates with practical knowledge or when clinical practice can be understood on the basis of theory. To reflect is a transition back and forth between theory and clinical practice – in thoughts and awareness and reality. Consequently, in such a setting of knowledge acquisition, supervisors play a crucial role as teachers.

Learning environments have direct and indirect impacts on student learning and ways in which students interact with others. Consequently, learning is an ongoing external interaction process between students and learning environments, which simultaneously, in turn, triggers an internal psychological process within students. If the interaction is not going so well, the supervisor's attitudes toward supervising student could be the problem. Various factors might influence these attitudes. Perhaps nurses feel pressured due to heavy administrative workloads and they might not have enough time to supervise students. Attitudes might also be a question of priorities, where focus is on immediately completing certain tasks [62]. Students might land last on a priorities list during fragmented working days that demand attention to regular duties [48]. If students perceived that supervisors, who were responsible for student learning, were less prepared and had little knowledge about curriculum and goals for the placement, then these perceptions might affect supervisors' attitudes [63].

Pedagogical encounters

Starting points for a pedagogical encounter in clinical education are often in a caring situation where a student has a goal to learn something (content component) and he/she interact with a person who has a task to teach the student within a particular field of knowledge. Often, this person is a supervisor, but even a patient may be an important actor in pedagogical encounters. He/she is the one who has knowledge of his own life situation. In pedagogical encounters involve always some activities for supporting learning (how to learn) and goals for learning [64]. Uljens [65], established the pedagogical encounter concept that has since evolved and been reworked for medical education purposes [64, 66]. Mc Niesh et al.[67] describe clinical learning through concrete experiences in relationship with patients and their relatives, other students, clinical nurse teachers, and other health care professionals. Being responsible for a patient led the students to pay attention to several situational nuances that were not obvious before. Students took more initiative to ask more questions that formed capacities required for becoming an effective nurse.

Encounters with real patients play a crucial role in learning. Independent practice in meeting patients' needs strengthens student self-esteem. This implies that students gain new insights and increased awareness of patient care. The supervisor or patient can contribute something specific, and all parties involved interact in one way or another according to current studies [8, 68]. Through real-life experiences, students gain new knowledge and evolve from being novices to being experts [69]. Compared to novices, expert nurses can easily identify patients' deviations from normal health conditions and thus can improve patients' conditions – thanks to several years of experiences [70].

Pedagogical encounters may also occur during discussions or observations – on the run-up to learning opportunities. Students must prepare themselves, make choices, and take decisions ahead of a learning activity. Feedback on a student's skills can be given directly in front of the patient (always an objective of such sessions). And these sessions aren't just learning activities for students – anyone can learn something – even patients who might gain more knowledge about their diseases. Regarding technologies, other stakeholders might also be involved in pedagogical encounters, for example, when physiotherapists or respiratory therapists instruct patients on how to use devices [64]. One study stated that students reported unmet learning needs, i.e., supervisors didn't prepare them before they entered encounters with patients – especially in

situations with suffering patients. Students must match past experiences with the theory they studied; in practice, student-supervisor interactions (discussions) promote student learning [68, 71].

The PHC system offers a comprehensive pedagogical-encounter platform for learning. The most significant pedagogical encounters via PHC could be with patients in PHC centres and in patients' homes, for example, during PHC-arranged home visits to dress a leg wound and in clinics where students instruct patients on how to use new blood glucose monitors. Students also get opportunities to meet patients' relatives and sometimes home-care staff who are not employed by PHC operations. During clinical placement, students get opportunities to meet many caregivers (e.g., nurses, general practitioners, and physiotherapists), and students can observe or participate in various scenarios. So students observe/experience extensive interaction throughout the day with patients and perhaps participate in clinical activities [51].

Motivation

Biggs and Bang [43] report that interaction is one component of ways in which students learn. Motivation, however, is the driving force for learning and one of the most critical aspects of the success of learning outcomes. Extrinsic and intrinsic motivating factors determine whether or not learning in depth occurs. Bengtsson and Ohlsson [72], report that students considered intrinsic motivation to be the most important factor that's based on an inner drive to learn the nursing profession. They view learning as an opportunity to satisfy their own desire to learn. Extrinsically motivated students strive to satisfy others such to please supervisors. Extrinsic and intrinsic motivating factors interact and can have a connection of positive and/or negative experiences during clinical learning.

Motivating extrinsic factors come from positive and negative learning experiences during clinical placement. These factors have consequences for self-learning approaches. Positive experiences driven by educational intentions increase student motivation and aid them in becoming nurses [73]. Acquiring meaningful learning placements for students depends on a cluster of components. Consequently, experiences from theoretical and practical learning must be interpreted, processed, tested again, and reflected upon – to develop new knowledge [61]. Today students must be active and demand support and more organized structure within the learning

experience. Mc Niesh et al.[67] reported that pedagogical training has not been an integral part of clinical education and has been neglected. Nurse teachers from universities depend on staff nurses' willingness to supervise students. In most cases, staff nurses are seldom trained in the finer nuances of educational methodologies. So more attention must be put on pedagogical encounters in which students get opportunities to become more active, take responsibility, and dare to ask questions.

2.1.3 Supervision in clinical learning environments

The present research used *supervision* and *supervisor* as main conceptual terms, which cover the relationship and interaction between students and clinical staff members. Severinsson [74] explains supervision: "*A pedagogical process with interaction between two people, where theory and/or practice is placed in a professional context*"(p.272). For nursing students, registered nurses regarding education in health care.

In nursing research, other related terms are used, for example: mentoring, preceptoring, or facilitating [3, 75, 76]. There is no unified term used in the literature; although all articles mention support and guidance of nursing students and assessment of learning in clinical settings [3, 77, 78]. Adequate nursing student supervision during clinical placement and positive clinical experiences can increase students' enthusiasm and facilitate the transition into the nursing profession [79]. Supervision can be organized in many ways and supervising students during clinical placement includes a series of pedagogical activities, for example: identifying and planning learning needs with students, assessing, and reflection [80]. Several studies indicate that reflection meetings regarding patients' situations are widely used when supervising students [81-84]. Reflection assists supervisors during situation assessment – when it comes to students' skills and knowledge [85]. Supervisors state that reflection is the most important component for learning and that reflecting together help students and supervisors and during supervision, the supervisors' questions can stimulate students to think; this, in turn, facilitates their professional development and helps them gain better understanding of patients' situation [86].

Severinsson [74] explains the "supervisor" concept: "*for the nurses, the concept can be associated with someone who directly supervises, controls and evaluates*"(p.273).

Other terms were used in nursing research for someone who supervises students is mentor, preceptor, and tutor.

According to supervisors' experiences, a climate that is engaging, confirming, creative, and permissive characterizes clinical learning environments. It is important that there is room for joy and gravity. Enabling a good introduction facilitates supervision and creates good relationships with students during their placement [87]. Hilli et al. [88] reported that supervisors provided support to students by walking "side-by-side" with student during early placement. After a while, supervisors stayed more in the background and tried to give students more responsibilities when they were ready for them. Relationships with supervisors constitute a key factor in clinical learning. These relationships help students bridge the gap between theory and practice and integrate theoretical knowledge into clinical practice. Students often follow the same supervisor during placement. This one-to-one relationship between a student and a supervisor is crucial for achieving learning outcomes and developing professionally [89].

Today, when students must take responsibility for learning, research reveals that it's better for students to follow several nurses, because tasks can be performed in various ways and this exposure gives students an option to reflect on. Supervisors will help students achieve clinical competence through integrating theoretical knowledge acquired at universities, applying skills in real-life situations, and learning to cooperate with everyone in the workplace [43]. So it's essential to ensure that students have high-quality clinical placements and that experienced, well-prepared nurses supervise them. Supervisor must understand and integrate expectations from nursing education programs, which do not primarily focus on evaluating students' abilities to carry out tasks, such as medication administration, intravenous starts, and catheter insertions. Supervisors' primary role is to guide and coach students toward greater understanding and a sense of professional responsibility for the practice of nursing in direct patient care [11].

Supervisors in clinical situations are responsible for student supervision – while dealing with patients who need immediate care. Consequently, they must simultaneously shift between these two roles, and often, students have lower priority. Ways in which supervisors manage this dilemma might depend on previous knowledge and experience in best managing the situation, while aiming to provide high-quality supervision [12,

62, 90, 91]. Student might be troubled by the situation if supervisors appear to be stressed or uninterested or if the activities do not match the nursing education curricula and objectives of the placement [92]. It is uncertain if staff members can meet each student's needs and whether supervisors are educated for this role in the clinical placement. Obviously, there is need for more education and support for supervisors in the clinical placement – if they are to meet students' learning and educational expectations. The supervision also depends on support that supervisors receive from all stakeholders involved with students' supervision (e.g., colleagues, unit managers, and nurse teachers from universities). Borch [93], reported that good results were achieved (i.e., the supervisory role was strengthened) with introduction of group supervision that provides opportunities for supervisors to discuss supervision-related issues. Staff members' contributions to a supportive, enthusiastic climate were instrumental in giving students maximum benefits from clinical placement experiences [94]. In general, several clinical supervision models were introduced in the clinical placements to support students' learning in Sweden and other Nordic countries, nurses supervise students with support from nurse teachers [95].

Supervisors, in their role as experts, are crucial. They can prepare various scenarios, which promote development of students' self-learning. To achieve this, opportunities for students to discuss, describe, and reflect on practice scenarios must be created. Supervisors do not have the opportunity to teach students everything but they can motivate students and thus enhance learning. All these elements together can help supervisors plan more efficient learning processes [49, 70]. Bourbonnais [96] reported that the association between supervisory relationships and positive ward atmospheres constituted the most important factor for learning. The relationship between supervisors and students is fundamental for successful learning experiences – as is supervisors' abilities to share knowledge and experiences with student. Once in place, these elements create opportunities for good learning atmospheres.

A study of Houghton [11], describe peripheral supervision and direct supervision observed various approaches to supervision. *Peripheral* supervision was used for senior students – enabling them to work more independently – compared to *direct* supervision that is more common for novices, who needed more supervisor support. In clinical learning environments, students are directly or indirectly supervised. Supervisors' responsibilities are to coordinate and plan learning experiences with the students.

Supervisors determine circumstances when student work independently and when they are indirectly supervised.

Students often have unrealistic expectation of their abilities to function as nurses. Feedback from supervisors regarding students' performances is important; this increases their awareness of their strengths and weaknesses [50]. The move towards a constructivist view of learning suggest that feedback needs to be meaningful and understood in the ways students make meaning from their learning experiences and engage in self-regulated learning. For example, supervisors' creative strategies – such as reflection meetings and practice development – benefit students' awareness and can be used in many clinical learning contexts to enhance students' self-knowledge and develop abilities needed for becoming a nurse. By stimulating student engagement, opportunities are created for meaningful and thoughtful dialogue with supervisors and other staff members. This leads to a win-win situation; all stakeholders reap benefits from learning activities [97].

Other perspective been discuss in literature of importance that affect clinical learning environments: health care organizations, ways in which collaboration is perceived, requisite supervisor capabilities that are necessary for the supervisor-student relationship [3, 77]. When accounting for these factors, many conditions/circumstances must be consistent for optimal learning. Many apply to the learning process occurs; others exist/occur outside the student. Everyone – supervisors, managers, teachers and other staff members – must collaborate and support learning that extends beyond student awareness [3, 98]. Consequently, supervisors needed to be well prepared to collaborate closely with responsible nurse teachers [54].

Collaboration and teamwork can improve patient care, because patients can take an active role in their care during teamwork encounters. Organizational learning fosters relationships with other professional (inter-professional learning) as does a reflective practice [99]. Pearson [100] complements this thinking by emphasizing the importance of understanding various workplace roles on a workplace, and sharing knowledge and ideas.

2.1.4. Collaboration between clinical placement and universities

Universities provide support for supervisors in clinical placement and provide openings for innovation generated by students within a planned pedagogical context [16, 101]. The overriding responsibility for clinical education and integration between theory and practice lies on the nurse teacher. Nurse teachers employed by universities have responsibility for informing supervisors about learning outcomes, coordinating student assessment, and preparing students for upcoming clinical placements [28].

In many European countries, nurses supervise students with varying degrees of support from nurse teachers [102]. For example, in the Nordic countries and UK, nurses are made available for supervising students with support from nurse teachers. In the US and Canada, clinical teachers – with formal teaching qualifications – are perceived to provide quality instruction in clinical settings [40]. Students at the start of their nursing education programs have certain expectations and experience uncertainty. When they enter the reality of practice, it can be challenging and stressful [103]. So the nurse teacher plays a key role in reducing students' stress and in working for a supportive learning environment that contributes to learning. Students experience stress from two sides: the university and the clinical placements. Learning procedures that occur in these environments present many challenges that trigger stress and anxiety [19].

Nursing education has changed substantially over a quarter of a decade. Nurses in hospitals now manage more complex health care interventions than previously. Students must attain competence in a mandatory range of subjects before earning their degrees [5]. In addition, they must keep up with current and future health- and medical-sector trends [16]. In the US, Ireland, Australia, and Canada, for example, the transition to a higher level of nursing education and subsequently more requirements on clinical practice has shifted responsibility for student learning from clinical staff to educational staff. To meet these requirements in hospitals and community programs/facilities, these countries introduced clinical *facilitators*, *instructors*, and *coordinators* to act as supervisors who support learning during clinical placement. Such persons are post-graduate nurses with extensive clinical experiences but no teaching degrees [104-106]. In the UK, a school nurse or a district nurse (specialists) are now practice teachers, and they are responsible for supporting students in various specialist practices within community settings [107]. They act as experts and facilitate clinical supervision with

the intention of arranging educational activities and of serving as resources for staff members.

In Sweden, during the 2000s attempts were made to introduce clinical lecturers who had teaching positions. To varying degrees, they work in clinical setting part of the time. This concept was developed to support supervisors and students and serve as a link between universities and clinical placements [108].

Recent studies report that clinical learning environments are not without problems. For example many clinical learning environments cannot provide students with positive atmospheres [109-112].

2.2 RATIONALE FOR THIS THESIS

Most previous studies with focus on clinical learning environment and supervision are from hospital perspective. There is evidence that the apprenticeship model is still the most common supervision model applied in students' clinical placements – despite nursing education transitioning to a higher educational level. However, little attention has focused on identifying of factors in PHC setting which most likely promote PHC as a good clinical learning environment based by nursing students' and their supervisors' experiences. Knowledge about PHC as a good learning environment is hopefully of practical use for everyone who is involved with nursing students' clinical learning in this context.

3 OVERALL AIM

The overall aim of the present research was to identify factors that promote good clinical learning environments in PHC settings. Clinical learning environment was investigated from students 'and supervisors' perspectives and their perceptions of the clinical part of nursing education in PHC settings. Students were in the fourth and fifth nursing program semesters. Supervisors were district nurses, a protected specialist nursing title in Sweden who has completed a three-year nursing education program (general, registered nurse education) and then a specialist education program, today on the masters level [5]. Some supervisors had only general nurse education yet fulfilled DN functions and supervised nursing students.

3.1 SPECIFIC AIMS

The present research intended to:

- I. To investigate DNs' experience of supervising of nursing students in PHC before and after the implementation of a new supervision model.
- II. To validate the Clinical Learning Environment, Supervision and Nurse Teacher (CLES+T) instrument in PHC settings by using confirmatory factor analysis and to identify the factors most relevant for student learning in these settings.
- III. To investigate the factors associates with dimensions in the clinical learning environment in PHC among nursing students.
- IV. To gain understanding of supervisors' experiences of supervising undergraduate students in primary health care units.

4 METHODOLOGY

4.1 RESEARCH APPROACH

This research investigated nursing students' experiences of clinical learning environments and supervisors' experiences of supervising nursing students – to be able to identify and describe good clinical learning environments in PHC settings. It attempted to identify conditions for learning in PHC units via the empirical data – not to explore what and how nursing students learn nursing care. The sample in the studies I, II, III was selected by using quantitative methods and in the study IV qualitative methods that can make significant contributions to knowledge about good clinical learning environments. Studies with quantitative methods focus on measurable attributes of phenomena and in qualitative approach research, the methods describe dimensions and variations of phenomena [113]. Selection of appropriate research methods depend on the goal of the research, the research question, and the perspective the researcher wants to investigate [114].

In studies I, II and III applied quantitative methods for data collection and analysis. These are the most appropriate when researchers are interested in explanations and variation in the study population – in a general sense. In quantitative analysis were the overall aim to organize the content by statistical procedures and take the structure and meaning of the research material [115]. Study IV applied a qualitative research approach and interviewed focus groups, which are recommended for capturing meaning and views from the participants in a collective context – to interpret and obtain deeper understanding of phenomena [113].

According to Guba and Lincoln [116] quantitative and qualitative methods may be used appropriately with any basic belief system or worldview (paradigm). Traditionally, a positivist paradigm is thought to be the most common paradigm in physical and social sciences. The fundamental ontological assumption is that there is a reality that can be studied. Positivism is linked to objectivism, and focus is explaining the social world by using quantitative methods to measure the effects and hypothesis testing to understand the world by collecting “facts”. To collect data using quantitative methods, investigators must be objective without being influenced by the data. They attempt to suppress personal beliefs and bias as much as possible during the research project. In contrast, within the constructivist paradigm, realities are understandable in the form of

multiple, socially, and experientially based, a construction of the individuals participating in the research. Methods of inquiry emphasize the understanding of humans' experiences as they are lived. Individual constructions can be refined through interaction among investigator and respondents.

Table-1 Overview of studies I to IV of the research reported in this thesis.

Study	I	II	III	IV
Focus	To investigate district nurses (DNs) experiences of supervising nursing students before and after an implementation of a new supervision model	To validate CLES+T instrument in PHC settings and to identify the factors most relevant for student learning in these settings	To investigate the factors associates with dimensions in the clinical learning environment in PHC among nursing students	To gain understanding of supervisors' experiences of supervising undergraduate students in primary health care units
Participants	DNs (Supervisors) Before: n=98/133 After: n=84/130	Nursing students n=356	Nursing students n=356	DNs (Supervisors) n=24
Design	Descriptive Quantitative	Validation Quantitative	Descriptive Quantitative	Descriptive Qualitative
Data collection	Questionnaire	Instrument CLES+T	Instrument CLES+T	Focus groups Interviews
Data analysis	Mann-Whitney-U-test Kruskal Wallis test	Psychometric testing Factor analysis	Uni –and Multivariat analysis	Content analysis

4.2 PARTICIPANTS AND SETTINGS

4.2.1.1 Study 1

The research was done between 2003 and 2008. Participants were DNs and some nurses (who act as DNs). They worked in PHC centres and in home care and supervised nursing students. Selection included urban and regional PHC units. Health care managers in 25 of 175 PHC units in one part of Stockholm County had received information about the intervention and the study's purpose. After receiving permission from managers, DNs from these 25 units received information in verbal and written form to help them decide whether or not they would participate in the study. Ninety-eight of 133 DNs from 22 PHC units decided to participate. One inclusion criterion for participating was at least two years of experience in supervising students in PHC settings. After the implementation, 84 of 130 DNs at 17 PHC units responded to the questionnaire – despite a reminder. Some DNs failed to complete the questionnaire due

to high workloads, some due to organizational changes in the unit. All the DNs were female (mean age 50); they had 24 years of professional nursing experience and 12 years of experience as DN.

4.2.1.2 Study II and III

Data for studies II and III were gathered between 2008 and 2010. Participants were undergraduate nursing students (n= 425) with a response rate of 84% (n=356) from one university in Stockholm. Purposive sampling was used, consequently, the researcher has knowledge of the population as being hand-picked for the study [117]. The students had clinical placements in 200 regional and urban PHC units throughout Stockholm County. The students were in their fourth and fifth semesters in their nursing programs (90% females; mean age, 28; range between ages 19–54).

4.2.1.3 Study IV

Study IV data were collected in 2008. A purposive sampling was used. The participants were DNs/nurses from PHC units. To increase the variety the centres, participants were strategically selected, and they worked in small and large centres (public and private) and in home care. An obvious inclusion criterion for participants was previously experience in supervising students. The sampling consisted of 24 DNs (23 female and one male; mean age 51). Only 10 participants had some form of pedagogical education. Most participants, who had earned nursing degrees, received them before 1993. Of all participants, only 7 had bachelor's degrees.

4.3 DATA COLLECTION

4.3.1 Study I

Questionnaire data were collected before and after implementation of a new supervision model that represented the intervention. A research team developed the model and questionnaire; the literature and the team's experience and expertise (regarding PHC as a learning environment) formed the foundation for development. Twelve DNs participated in the pilot; worked in several PHC units and supervised students. Analysis of pilot results led to a 51-item questionnaire with three response options: *yes*, *no*, and *don't know* – or four options: *very high degree*, *quite high degree*, and *quite low degree*. The questionnaire covered these general areas: supervisors' background (12 items), performance of supervision (25 items), and organization of supervision (14 items).

Intervention research is a process; its overall objective is to study effects before and after something new was introduced. In most studies, researchers develop comparisons to provide a context for interpreting results [114]. Study I compared group members' experiences before and after implementation (no control group was implemented). One inclusion criterion was that the DNs had two years of experience in supervising students.

The supervision model was presented during the first half of 2003 for managers in 25 PHC units in a city district (Stockholm) in which students received clinical education. The managers received information about the intervention and the study's purpose. After each manager approved the study, questionnaires were distributed at year-end 2003. DNs from 25 centres received information verbally (a meeting was held in each PHC unit). They also received written information by the researcher about the intervention and the study and a consent form., According to Kreuger and Casey [113] rigorous communication efforts create open, positive attitudes toward participation. DNs from 22 of 175 PHC units chose to participate.

One DN in each centre, who had responsibility for student placements, received information about the study and an invitation to become the study's contact person. If a centre had no previously designated person, then DNs in the centre were asked to nominate a DN as a contact person who would administer the questionnaire at the

centre. Each contact person was asked to once again verbally inform all DNs, distribute and collect the questionnaires, and account for the questionnaires on a coded list (all DNs were guaranteed confidentially, so each DN was assigned a code).

Each respondent's questionnaire was put into a sealed envelope along with a notation of the questionnaire's distribution and submission date. All envelopes were put into one self-addressed, postage-paid envelope and sent to an impartial person at the Centre for Family Medicine (CeFAM). To maximize participation, contact persons reminded respondents by phone– if they had not completed the questionnaire during the designated period.

4.3.2 Implementation of a new supervision model

The new supervision model was developed to meet challenges that the research team experienced. One such challenge was the transition from nursing education to academic education.

The new supervision model as an intervention had these components:

- One DN, acting as a main supervisor, organizes the structure and content of students' clinical learning and coordinates supervision among all supervisors in one PHC unit.
- One or two DNs, acting as co-supervisors enhance students' patient-care experiences. Here, the objective is to broaden student knowledge by observing ways in which DNs care for patients in various situations and reflecting over DNs' actions. Procedural execution (action) and reflection on the action thus expand their knowledge base and enrich the learning experience.
- Focus on certain patients and their health- and medical-care needs or problems; here the aim is for students to develop deeper insight into an individual patient's health care circumstances.
- Pedagogical seminars held at PHC centres – rather than universities. Participants are students with their supervisors, the main supervisor, and a nurse teacher from a university. The aim is to integrate theory and practice knowledge and to support collaboration between the university and the PHC unit. On the run-up to the seminars, students prepare for them by selecting health- and medical care problems from real patient care situations and searching for the latest research findings linked to the patients' health care problems. During the seminars, participants discuss and reflect; here, the goal is to develop and deepen their knowledge.

The intervention

Networks meetings

Model implementation involved 12 networks meetings (22 hours) between January 2004 and May 2005 for DNs with main supervisor responsibility at each centre; 18 persons participated.

Those responsible for day-to-day supervision could participate in four of these meetings (15 hours); 12 persons participated and discussed their experiences with the model.

Two clinical teachers organized these network meetings that dealt with the new supervision model and whether or not it was relevant/applicable to their situations. They discussed other supervision models, their supervision experience, experiences of assessing students' performance, and the structure and content of clinical learning activities in nursing education. The number of DNs at these meetings varied from 12-18. One important purpose of these meetings was to increase coherence within nursing education.

Pedagogical seminars

Nurse teacher from universities together with clinical teachers arranged seminars for nursing students and their supervisors. The students prepared for the seminars by searching for one patient situation with health and medical care problems and searching for the latest research findings linked to these problems. The overall aims were to integrate theoretical knowledge with clinical practice and bring new research findings into the field. Students also had opportunities to practice their presentation skills. Supervisors had opportunities to meet their colleagues from other PHC units and to share experiences with each other. During seminars supervisors and students also listened short presentations about the latest knowledge of some public health issues and diseases and discussed about this.

4.3.3 Study II

Identifying factors that promote good clinical learning environments in PHC settings it is necessary to measure students' experiences on PHC as a learning environment. For

measuring it's important to find valid and reliable instruments. The *Clinical Learning Environment, Supervision, and Nurse Teacher* scale (CLES+T) demonstrated a high degree of content and construct validity. It was administrated to the nursing students from different countries and it has demonstrated marginal to high reliability coefficient. [26-28, 118, 119]. Johansson et al.[120] have translated the English version of CLES+T scale into Swedish and validated it in hospital settings. This triggered the decision to test and validate CLES+T scale within the PHC context.

For study II, an expert panel of seven DNs evaluated each items in the CLES + T scale for its relevance in Sweden's PHC context and for comprehensibility of all statements. The definitive version of the revised CLES+T scale consisted of 34 items. Data on nursing student's experiences from PHC units were collected one week after their clinical placement between December 2008 and January 2010.

The researchers ensured that nursing students received written and oral information about the study. A written confidentiality and anonymity guarantee was distributed and reinforced verbally during initial contact. Together with nurse teachers they distributed a paper-based questionnaire to undergraduate nursing students ($n=639$); the response rate was 56% ($n=356$). Completion took about 10 minutes. All identifying names and places were removed during transcription, and the transcripts were numerically coded. To ensure security, collected data was locked in the drawers of the researchers' office.

4.3.3.1 Instrument

The original *Clinical Learning Environment and Supervision* scale was developed in Finland [119] tested in hospitals, and used in international comparison studies [27]. The theoretical framework of the origin CLES scale is from 67 empirical studies and five audit instruments into clinical learning environment and supervision. The sub-dimension (Nurse Teacher) is basing on literature review with 22 empirical studies, four literature reviews and four discussion papers undertaken during 1990-2006 [118]. The scale was used to understand these aspects of nursing student's experiences: (1) *the type of clinical learning environment*, (2) *the contact and relationship with supervisors in practice*, and (3) *contact with the nurse teacher*. Today there are over 20 language versions from CLES and /or CLES+T scales and researcher link to CLES+T over 40 countries.

The scale originally [118] addressed:

- *Supervisory relationships* – relationship between students and supervisors
- *Pedagogical atmosphere on the ward* – ward atmosphere, attitude, communication and ward culture in a unit
- *Leadership styles of ward managers* -facilities and resources for nursing care in a unit
- *Premises of nursing care on the ward* – quality of nursing care

Later [118], the scale was expanded to include:

- *Nurse teacher* – support for students during clinical placement, pedagogical support for staff members

The CLES+T scale consisted of 34 items with Likert-type responses, where 1 = *fully disagree* to 5 = *fully agree*. The scale has five latent factors (1) supervisory relationship = 8 items, (2) pedagogical atmosphere in the ward = 9 items, (3) role of nurse teacher = 9 items, (4) leadership style of the ward manager =4 items, and (5) premises of nursing care on the ward = 4 items. The original CLES+T scale also covered background variables related to respondents' age, gender, earlier nursing experience, and type of ward they had just left. Respondents' satisfaction was indicated at the end of scale with the options: *low*, *high*, and *very high* – regarding the clinical part of education. Students' degree of motivation within the clinical placement was indicated with the options: *low*, *high*, and *very high*. The students indicated also their experience of preferred professional role model for supervision with the options: *supervisor*, *nurse teacher*, or *both*.

4.3.4 Study III

Study III applied a quantitative approach and its results are based on data gathered in study II (Bos et al., 2012). The valid CLES+T scale was used for data collection, [121, 122]. Three supplementary questions were added to the end of the valid Swedish instrument; the questions dealt with these factors that were the focus of this study: *motivation*, *satisfaction* and *professional role model*. These factors were an important addition to the CLES + T scale and needed to be measured. According to previous studies, these factors are crucial for clinical learning environments [3, 51, 72, 92]. (The response options were reported during data collection in study II)

4.3.5 Study IV

Data were collected via focus-group interviews. Focus group interviews are widely used as a data collection method. This method explores group members' experiences, thoughts, and knowledge [113]. This method enabled DNs to gain deeper understanding and to clarify their experiences from supervising students.

Implementation involves gathering qualitative data via interactional group dynamics – with specific focus on persons who have similar backgrounds. The group method provides better data collection and analysis opportunities [113], – compared to individual interviews, which demands more time and limits acquisition of valuable information.

During the group sessions, a moderator can further stimulate discussion and thus acquire more information. Focus-group participant selection was based on the research team's intentions to share their experiences of the phenomenon being studied. Study IV focus groups consisted of 4–6 participants, which participants consider to be most comfortable for discussion [113].

Focus group inclusion criteria were having DN work experience in a PHC unit and having had supervised students. Twenty-three women and one man participated in the focus groups. The researcher contacted them by phone, invited them to the focus group interview, and asked whether they were willing to participate in study IV. Those who agreed received information via regular mail. They needed permission from their managers to participate (their managers received the same information).

After an open presentation, the moderator began by giving all participants information about the study's purpose (an observer participated with each session and took important notes). All participants had the opportunity to take part in the discussion and could respond to statements/questions from the interview guide about participants' experience of PHC as a learning environment. The interview guide contained open-ended questions related to pedagogical encounters with students and universities, pedagogical atmosphere, and leadership at the PHC centre.

The interviews occurred at participants' workplaces in a separate room at the end of the working day. The interviews lasted 50–60 minutes. Six focus-group sessions were

sufficient to achieve saturation. Participants were also told that the researcher would tape and then transcribe the interview verbatim. Data collection occurred during 2008.

Pre-understanding of the context

As a researcher, it's important to be aware of the fact that pre-understanding and subjectivity maybe can have impact on results [116]. The main researcher had extensive work experience within PHC units. Before and during data collection, the researcher was responsible for planning students' clinical placements and supervision at one PHC unit. As a clinical teacher, the researcher had contact with many students and their supervisors. Familiarity with the topic being researched can be an advantage and disadvantage for studies. The researcher had no relationship to participants, but perhaps the name and face might be familiar to some study participants (via other educational activities), and this could have an effect on the studies. Although established contact with participants might be an advantage. Lincoln and Guba (1985) recommend some activities for establishing data quality. To enhance trustworthiness for example, the researcher wrote down observations and took reflective notes after data collection in study IV and analyzed subsequent decision-making in dialog with supervisors (other research team members).

4.4 DATA ANALYSIS

4.4.1 Study I

Descriptive statistics captured participants' characteristics. The level of significance was set to $P \leq 0.05$ to see if any differences existed in distribution between the independent groups of variables before and after the implementation. Two measurements were taken before and after with two independent groups that were compared to determine if the groups varied. Data were analyzed with the Wilcoxon-Mann-Whitney test for two times two tables and the Kruskal-Wallis test were used for large tables assuming independence between groups [115]. The StatXact application (version 6.3) was used for all calculations.

4.4.2 Study II

Descriptive analysis was used for all items in the CLES+T scale (Table 2). Exploratory factor analysis (EFA) was used to reduce the number of variables and to identify construct in the data (Table 3) [123]. Confirmatory factor analysis (CFA) was used to investigate the association between the identified factors and outcomes of interest (Table 4). [124, 125]. After EFA and CFA analyses, one model was developed. Because supervisory relationship was ranked highest, the model was created to demonstrate the correlation between the other four factors in the CLES+T scale, and how each relationship influenced statistical outcomes that were associated with the context of learning environments in the PHC settings.

4.4.2.1 Factor analysis methods

This brief description explains data analysis using the EFA and CFA.

Exploratory factor analysis; several primary studies [120, 122] which tested the CLES+T scale, used EFA; although the analysis might not always evaluate relationships among variables within a given dataset. The variable reduction method identifies the number of latent constructs and the underlying factor structure of a set of variables of a reduced dataset. The mechanics of extraction and rotation methods determine factor structures in an EFA. And all factors are either correlated or uncorrelated. EFA is recommended for early questionnaire development stages [124].

Confirmatory factor analysis: a more sophisticated statistical method used to verify the factor structure of a set of observed variables, which describes associations between factors and their collective influence on outcomes. CFA was not applied during validity/reliability testing of the CLES+T scale and within the context of study II. CFA allows researchers to test the theoretical hypothesis that a relationship exists between observed variables and their underlying latent constructs. Researchers use knowledge of the theory, empirical research – or both – to postulate the relationship pattern a priori and then test the hypothesis statistically.

Study II combined results from the EFA with the CFA in the same dataset – to establish validity of a single factor model, *Second order CFA model* by Byrne [126]. During CFA, the research team selected the *supervisory relationship* factor, which was the

most important, established factor in the pre-analysis during study II – as per previous studies [120, 122] – to estimate the true relation between this factor and other factors.

The objective was to determine if the number of factors and loadings measured, and their results, show that the variables really belong together and have enough charge to confirm the full five-factor model. Study II combined results from the EFA with the CFA in the same dataset – to establish validity of a single factor model – as described in *Second order CFA model* by Byrne [126].

During CFA, the research team selected the *supervisory relationship* factor, which was the most important, established factor in the pre-analysis during study II – as per previous studies [120, 122] – to estimate the true relation between this factor and other factors. Factor loadings were estimated by oblique rotation and the suggested model indicated that the *supervisory relationship* factor has a relationship to other factors [127].

4.5 STUDY III

In study III, univariate and multivariate analysis of variance and covariance (ANCOVA/MANCOVA) were used on the data – to analyze differences between groups on mean ratings and in the total scale [115].

In study I, statistical analyses were done using STATA, version 9 (StataCorp LP College Station, Texas, US) and StatXact, version 6.3 (Cytel Software Corp, Cambridge, US). In studies II and III, all statistical analyses were done with SAS 9.22 (SAS Institute, Cary, NC, USA).

4.6 STUDY IV

To obtain deeper understanding of DNs' experiences of supervising nursing students, method literature recommender qualitative *content analysis* as a suitable method for study IV [117]. Qualitative content analysis is a more complex method and more difficult to implement than quantitative content analysis because it is less standardized. Content analysis is widely used in qualitative research approaches; it is a process with many stages and procedures for organizing and analyzing text, and it involves

interpretation of the underlying meaning of text. Findings emerge through researchers' communication with the data [128-131]. Study IV used an *inductive approach to content analysis*, which is recommended if there is very little knowledge about a phenomenon; with this approach, categories are derived from data content [132]. And interpretation focuses on the text (*manifest content*) and underlying meaning (*latent content*) of the interview text [129].

Content analysis

During inductive content analysis, the research team:

1. Assigned an ID to each focus group and its PHC centre – to link a specific set of notes or quotes with a group or unit.
2. Listened to all interview recordings several times to become familiar with each interview's content.
3. Did several rounds of naïve reading to get the big picture regarding overall content.
4. Took notes on units of meaning and identified content relevant to the study's aim.
5. Clustered units of meaning with the same content and condensed the units into subcategories, close to the statement/question areas in the interview guide.
6. Extensively discussed emerging themes and subthemes – organizing and reorganizing themes and subthemes until all authors reached consensus on interpretation of the data [113].

5 FINDINGS

The overall aim of the present research was to identify factors that promote good clinical learning environments in PHC settings. This chapter presents the research findings in consecutive order (**note:** studies II and III deal with nursing students and studies I and IV deal with supervisors).

5.1 STUDY I

Study I investigated DNs' experiences of supervising student nurses in PHC units before and after implementation of a new supervision model; 98 of 133 (74%) responded to the questionnaire *before* implementation and 84 of 130 (65%) responded after implementation.

5.1.1.1 *Before implementation*

Supervising DNs indicated that potential existed for conveying the PHC mission and function to students during their clinical education in PHC units. DNs had extensive experience in the profession and felt secure in their professional and supervisory roles. But more than 50% lacked formal qualifications in the supervisory role. Only one-third had training in educational methods and more than 80% had received degrees as a registered nurse before 1993, that is, before the scientific approach was introduced in nursing education courses.

The statistical analysis revealed that before intervention, 36% of the DNs thought it was hard to keep up with the nursing education program and to follow and use its assessment form. The analysis also showed that 39% of DNs lacked support from the universities and 52% of the DNs lacked support from their managers in PHC centres – although 91% of the DNs received support from their colleagues *before* implementation.

5.1.1.2 *After implementation*

Analysis of the data (DN's responses) revealed six changes that occurred after implementation:

1. *More students received more supervision.* By following the new model, the students were supervised by more than one supervisor at the centre (before implementation, 14% and after, 61%).

2. A contact person was designated for administration of students (before implementation, 82% and after, 94%).
3. A person primarily responsibility for clinical education was appointed (before intervention, 33% and after, 68%)
4. A binder that contained information was provided for students (before intervention, 29%, and after, 81%).
5. A binder that contained information was provided for supervisors. By giving up-to-date information about courses and curriculum to other supervisors into a binder to collecting all new information; (before intervention, 19% and after, 53%).
6. A written welcome letter was sent to students (before intervention, 26% and after, 63%). Note: at the time of the study, e-mail use was not a standard procedure. Most information was sent before the placement vial the postal service to the manager in each unit – thus the need for a binder.

The statistical analysis showed increased collaboration and contact with universities and nurse teacher (before intervention, 39% of DNs and after, 54%) by involving nurse teachers in the network meetings. After invention, 78% of the DNs received support from their colleagues.

5.2 STUDY II

Study II validated the CLES+T scale and identified *factors* most relevant for learning within PHC units. All five identified factors yielded a Cronbach's alpha value > 0.94 which demonstrates good internal reliability (Table 2). Refer to the "Data analysis" chapter for further clarification of data analysis methods.

Confirmatory factor analysis allows us to test results of previous studies which has used the same instrument [120, 122] where one of the main findings show factor 1 (*supervisory relationship*) were an important and established factor.

The results from factor analysis of the five factors

Factor 1 (F1) – 8 items covered *supervisory relationship* – with an eigenvalue of 11.46 – and explained 39% of the response variance. The response frequency to all items for this factor had an overall median near 4.0. The EFA (Table 3) and CFA (Table 4) resulted in the same results for F1 – and all items that are associated with this factor have the same grouping as the original CLES+T scale. The students evaluated their supervisory relationship experience in PHC units as positive (as measured by the CLES+T scale).

Factor 2 (F2) – 9 items covered *pedagogical atmosphere* – with an eigenvalue of 6.84; analysis of these items explained 15% of the response variance. F2 had the lowest loading value than the other four factors due to low multicollinearity as per the EFA. Here, multicollinearity refers to a situation in which two or more independent variables in a multiple regression model are highly linearly related, but commonly there is an nearly exact linear relationship among these variables [124]. All items associated with F1 – except items 9, 11, 12, and 14 have the same compatibility. This four items correlated with F2 (Table 3). Descriptive analysis showed that students were quite positive about the pedagogical atmosphere; the median was close to 4.0 (Table 2). According to the CFA, correlation between F2 and F1 was the highest. The coefficient was 83% (see the model in the study II article).

Factor 3 (F3) – 9 items covered *role of nurse teacher* – with an eigenvalue of 6.49; this factor explained 6% of the response variance. All items associated with F3 – except 18, 19, and 20 had same compatibility; they correlated instead with F5. Descriptive analysis results indicated that more than 50% of the students fully disagree with statements in items 21-26 – regarding the nurse teacher’s role (Table 2). CFA results indicated that F3 and F1 have the lowest correlation coefficient (26%).

Factor 4 (F4) – 4 items covered *leadership style of the ward manager (WM)* – with an eigenvalue of 6.11; this factor explained 4% of the response variance. All items associated with F4 had a strong tendency to correlate toward F2 (Table 3). More than 40% of the students fully disagreed item 29 with statement: *feedback from the WM could easily be considered a learning situation*. As per the CFA, F4 and F1 had a correlation coefficient of 48% (see the model in the study II article).

Factor 5 (F5) – 4 items covered *premises of nursing on the ward* – with an eigenvalue of 5.57; this factor explained 4% of the response variance. All items associated with F5 were in the same group with a tendency to instead correlate with F4 (Table 2). The CFA results indicated that F5 had a high correlation coefficient of 69% with F1 (see model in paper II). This model in study II provided a satisfactory fit to the data for several goodness-of fit-criteria [133].

Summary of CFA

The CFA results indicated a significantly strong correlation between *supervisory relationship* and *pedagogical atmosphere* ($r=0.83$), and a slightly weaker correlation between *supervisory relationship* and *premises of nursing* ($r=0.69$). *Supervisory relationship*, however, moderately correlated with *leadership style* ($r=0.48$) and even less with *role of the nurse teacher* ($r=0.26$).

Table-2 Overview of survey responses on the CLES+T scale.

Question	N (%)*					Median (SD)
	(1) <i>fully disagree</i>	(2) <i>disagree to some extent</i>	(3) <i>neither agree nor disagree</i>	(4) <i>agree to some extent</i>	(5) <i>fully agree</i>	
1-My supervisor showed a positive attitude towards supervision (N=354)	15 (4.2)	25 (7.0)	54 (15.2)	97 (27.2)	163 (45.8)	4.00 (1.13)
2-I felt that I received individual supervision (N=354)	17 (4.8)	33 (9.3)	38 (10.7)	96 (27.0)	170 (47.8)	4.00 (1.18)
3-I continuously received feedback from my supervisor (N=354)	30 (8.4)	42 (11.8)	63 (17.7)	104 (29.2)	115 (32.3)	4.00 (1.28)
4-Overall I am satisfied with the supervision I received (N=354)	26 (7.3)	33 (9.3)	37 (10.4)	110 (30.9)	148 (41.6)	4.00 (1.25)
5-The supervision was based on a relationship of equality and promoted my learning (N=354)	22 (6.2)	29 (8.1)	36 (10.1)	111 (31.2)	156 (43.8)	4.00 (1.20)
6-There was a mutual interaction in the supervisory relationship (N=353)	18 (5.1)	25 (7.0)	54 (15.2)	106 (29.8)	150 (42.1)	4.00 (1.15)
7-Mutual respect and approval prevailed in the supervisory relationship (N=354)	17 (4.8)	16 (4.5)	39 (11.0)	107 (30.1)	175 (49.2)	4.00 (1.10)
8-The supervisory relationship was characterized by a sense of trust (N=353)	20 (5.6)	21 (5.9)	46 (12.9)	100 (28.1)	166 (46.6)	4.00 (1.62)
9-The staffs were easy to approach (N=355)	3 (0.8)	9 (2.5)	53 (14.9)	134 (37.6)	156 (43.8)	4.00 (0.85)
10-I felt comfortable going to the ward at the start of my shift (N=354)	12 (3.4)	40 (11.2)	60 (16.9)	110 (30.9)	132 (37.1)	4.00 (1.14)
11-During staff meetings (e.g. before shifts) I felt comfortable taking part in the discussions (N=351)	116 (32.6)	59 (16.6)	62 (17.4)	63 (17.7)	51 (14.3)	3.00 (1.46)
12-There was a positive atmosphere on the ward (N=354)	7 (2.0)	28 (7.9)	64 (18.0)	124 (34.8)	131 (36.8)	4.00 (1.02)
13-The staffs were generally interested in student supervision (N=353)	32 (9.0)	37 (10.4)	85 (23.9)	116 (32.6)	83 (23.3)	4.00 (1.22)
14-The staff are need to know the students by their personal names (N=349)	10 (2.8)	27 (7.6)	53 (14.9)	97 (27.2)	162 (45.5)	4.00 (1.09)
15-There were sufficient meaningful learning situations on the ward (N=354)	29 (8.1)	45 (12.6)	71 (19.9)	103 (28.9)	106 (29.8)	4.00 (1.26)
16-The learning situations were multi-dimensional in terms of content (N=353)	25 (7.0)	70 (19.7)	82 (23.0)	107 (30.1)	69 (19.4)	3.00 (1.20)
17-The ward can be regarded as a good learning environment (N=353)	22 (6.2)	47 (13.2)	71 (19.9)	112 (31.5)	101 (28.4)	4.00 (1.20)
18-In my opinion, the NT was capable of integrating theoretical knowledge and everyday practice of nursing (N=316)	74 (20.8)	43 (12.1)	128 (36.0)	50 (14.0)	21 (5.9)	3.00 (1.19)
19-The NT was capable of operationalising the learning goals of this placement (N=323)	82 (23.0)	60 (16.9)	117 (32.9)	43 (12.1)	21 (5.9)	3.00 (1.19)
20-The NT helped me to reduce the theory-practice gap (N=317)	92 (25.8)	65 (18.3)	120 (33.7)	30 (8.4)	10 (2.8)	3.00 (1.18)
21-The NT was like a member of the nursing team (N=312)	217 (61.0)	19 (5.3)	47 (13.2)	13 (3.7)	16 (4.5)	1.00 (1.18)
22-The NT was able to give his or her expertise to the clinical team (N=312)	201 (56.5)	26 (7.3)	57 (16.0)	19 (5.3)	9 (2.5)	1.00 (1.13)
23-The NT and the clinical team worked in supporting my learning (N=258)	207 (58.1)	23 (6.5)	56 (15.7)	12 (3.4)	14 (3.9)	1.00 (1.15)
24-The common meetings between myself, mentor and NT were comfortable experience (N=257)	137 (38.5)	6 (1.7)	54 (15.2)	36 (10.1)	25 (7.0)	1.00 (1.46)
25-In our common meetings I felt that we are colleagues (N=255)	127 (35.7)	15 (4.2)	56 (15.7)	38 (10.7)	21 (5.9)	2.00 (1.41)
26-Focus on the meetings was in my learning needs (N=349)	126 (35.4)	15 (4.2)	58 (16.3)	33 (9.3)	23 (6.5)	2.00 (1.41)
27-The WM regarded the staff on her/his ward as a key resource (N=349)	7 (2.0)	21 (5.9)	80 (22.5)	129 (36.2)	112 (31.5)	4.00 (0.98)
28-The WM was a team member (N=322)	25 (7.0)	25 (7.0)	71 (19.9)	119 (33.4)	109 (30.6)	4.00 (1.18)
29-Feedback from the WM could easily be considered a learning situation (N=350)	146 (41.0)	44 (12.4)	76 (21.3)	36 (10.1)	20 (5.6)	2.00 (1.29)
30-The effort of individual employees was appreciated (N=353)	12 (3.4)	33 (9.3)	105 (29.5)	131 (36.8)	69 (19.4)	4.00 (1.02)
31-The units nursing philosophy was clearly defined (N=353)	78 (21.9)	74 (20.8)	102 (28.7)	72 (20.2)	27 (7.6)	3.00 (1.23)
32-Patients received individual nursing care (N=353)	5 (1.4)	30 (8.4)	62 (17.4)	144 (40.4)	112 (31.5)	4.00 (0.98)
33-There were no problems in the information flow related to patients' care (N=353)	14 (3.9)	55 (15.4)	75 (21.1)	130 (36.5)	79 (22.2)	4.00 (1.12)
34-Documentation of nursing (e.g. nursing plans, daily recording of nursing procedures, etc.) was clear (N=353)	31 (8.7)	65 (18.3)	87 (24.4)	116 (32.6)	54 (15.2)	3.00 (1.19)

* Some percentages do not total 100 because of rounding and missing.

Table-3 EFA; oblique factor loading for nursing students (n = 356) on the CLES+T scale.

	Factor-1	Factor-2	Factor-3	Factor-4	Factor-5	Cronbach's Alpha if Item Deleted (KMO)	1-Communality
Supervisory relationship							
1-My supervisor showed a positive attitude towards supervision	0.84	0.03	0.00	-0.03	0.07	0.94 (0.97)	0.26
2-I felt that I received individual supervision	0.83	-0.08	-0.01	0.20	0.00	0.94 (0.95)	0.21
3-I continuously received feedback from my supervisor	0.81	0.05	-0.01	0.09	0.00	0.94 (0.96)	0.24
4-Overall I am satisfied with the supervision I received	0.92	-0.03	0.01	0.00	0.00	0.94 (0.94)	0.17
5-The supervision was based on a relationship of equality and promoted my learning	0.93	-0.04	0.02	-0.04	0.04	0.94 (0.93)	0.17
6-There was a mutual interaction in the supervisory relationship	0.95	-0.04	-0.01	-0.02	-0.01	0.94 (0.93)	0.17
7-Mutual respect and approval prevailed in the supervisory relationship	0.95	0.00	0.06	-0.09	-0.10	0.94 (0.93)	0.18
8-The supervisory relationship was characterised by a sense of trust	0.92	-0.00	0.09	-0.11	-0.08	0.94 (0.92)	0.26
Pedagogical atmosphere							
9-The staffs were easy to approach	0.27	0.62	0.03	-0.04	-0.12	0.94 (0.90)	0.42
10-I felt comfortable going to the ward at the start of my shift	0.74	0.18	-0.00	-0.06	0.02	0.94 (0.96)	0.32
11-During staff meetings (e.g. before shifts) I felt comfortable taking part in the discussions	0.10	0.48	-0.00	0.15	0.07	0.94 (0.95)	0.60
12-There was a positive atmosphere on the ward	0.27	0.59	0.09	0.06	-0.15	0.94 (0.92)	0.35
13-The staffs were generally interested in student supervision	0.56	0.10	0.06	0.20	0.05	0.94 (0.96)	0.41
14-The staff learned to know the students by their personal names	0.25	0.38	0.12	0.11	-0.17	0.94 (0.92)	0.63
15-There were sufficient meaningful learning situations on the ward	0.59	0.06	-0.13	0.18	0.22	0.94 (0.92)	0.38
16-The learning situations were multi-dimensional in terms of content	0.51	0.13	-0.18	0.17	0.29	0.94 (0.92)	0.42
17-The ward can be regarded as a good learning environment	0.52	0.13	-0.18	0.17	0.30	0.94 (0.94)	0.38
Role of nurse teacher							
18-In my opinion, the NT was capable of integrating theoretical knowledge and everyday practice of nursing	0.07	0.04	0.12	-0.03	0.79	0.94 (0.90)	0.23
19-The NT was capable of operationalising the learning goals of this placement	0.00	0.06	0.16	-0.07	0.79	0.94 (0.90)	0.23
20-The NT helped me to reduce the theory-practice gap	-0.03	0.00	0.18	0.05	0.79	0.94 (0.89)	0.18
21-The NT was like a member of the nursing team	-0.03	-0.05	0.77	0.16	0.09	0.94 (0.92)	0.27
22-The NT was able to give his or her expertise to the clinical team	0.03	-0.08	0.80	0.09	0.14	0.94 (0.88)	0.19
23-The NT and the clinical team worked in supporting my learning	-0.00	0.04	0.78	0.10	0.13	0.94 (0.90)	0.21
24-The common meetings between myself, mentor and NT were comfortable experience	-0.00	0.04	0.95	-0.07	-0.04	0.94 (0.87)	0.15
25-In our common meetings I felt that we are colleagues	-0.02	0.04	0.94	-0.08	-0.05	0.94 (0.84)	0.16
26-Focus on the meetings was in my learning needs	-0.04	0.03	0.87	-0.07	0.01	0.94 (0.91)	0.22
Leadership style of the Ward manager (WM)							
27-The M regarded the staff on her/his centre as a key resource	-0.06	0.86	0.01	-0.02	-0.02	0.94 (0.87)	0.33
28-The WM was a team member	-0.15	0.85	-0.04	-0.07	0.11	0.94 (0.86)	0.37
29-Feedback from the WM could easily be considered a learning situation	-0.07	0.55	0.04	0.03	0.20	0.94 (0.90)	0.61
30-The effort of individual employees was appreciated	0.04	0.58	-0.05	0.27	0.00	0.94 (0.94)	0.48
Premises of nursing							
31-The ward nursing philosophy was clearly defined	0.05	0.15	0.02	0.63	0.19	0.94 (0.93)	0.44
32-Patients received individual nursing care	0.32	0.00	0.03	0.57	-0.09	0.94 (0.93)	0.42
33-There were no problems in the information flow related to patients' care	-0.03	0.06	0.08	0.86	0.17	0.94 (0.88)	0.28
34-Documentation of nursing (e.g. nursing plans, daily recording of nursing procedures, etc.) was clear	-0.09	0.01	0.03	0.76	0.13	0.94 (0.87)	0.38

* Bold still marked represent abs (loading) > 0,30

Eigenvalues before rotation (Cumulative proportion)

Eigenvalues after *oblique rotation* (Proportion)

13.13 (0.39) 5.11 (0.54) 2.13 (0.60) 1.57 (0.64) 1.31 (0.68)

11.46 (0.34) 6.84 (0.20) 6.49 (0.19) 6.11 (0.17) 5.57 (0.16)

Scale reliability coefficient

Cronbach's alpha ignoring the factor

Overall Cronbach's alpha (0.95)

Overall Kaiser-Meyer-Oklin (KMO) (0.92)

$\chi^2=6616$, $df=561$; $p<0.001$ RMSR = 0.04,

Table-4 Second-order CFA. Standardized factor loading matrix (n=356) using unweighted least-squares estimation.

	Factor-1	Factor-2	Factor-3	Factor-4	Factor-5	R-square
Supervisory relationship						
1-My supervisor showed a positive attitude towards supervision	0.86	—	—	—	—	0.80
2-I felt that I received individual supervision	0.88	—	—	—	—	0.84
3-I continuously received feedback from my supervisor	0.90	—	—	—	—	0.86
4-Overall I am satisfied with the supervision I received	0.94	—	—	—	—	0.93
5-The supervision was based on a relationship of equality and promoted my learning	0.96	—	—	—	—	0.86
6-There was a mutual interaction in the supervisory relationship	0.96	—	—	—	—	0.89
7-Mutual respect and approval prevailed in the supervisory relationship	0.95	—	—	—	—	0.83
8-The supervisory relationship was characterized by a sense of trust	0.92	—	—	—	—	0.79
Pedagogical atmosphere						
9-The staffs were easy to approach	—	0.68	—	—	—	0.47
10-I felt comfortable going to the ward at the start of my shift	—	0.83	—	—	—	0.73
11-During staff meetings (e.g. before shifts) I felt comfortable taking part in the discussions	—	0.50	—	—	—	0.34
12-There was a positive atmosphere on the ward	—	0.74	—	—	—	0.61
13-The staffs were generally interested in student supervision	—	0.75	—	—	—	0.68
14-The staff learned to know the students by their personal names	—	0.65	—	—	—	0.41
15-There were sufficient meaningful learning situations on the ward	—	0.85	—	—	—	0.64
16-The learning situations were multi-dimensional in terms of content	—	0.76	—	—	—	0.47
17-The ward can be regarded as a good learning environment	—	0.87	—	—	—	0.66
Role of nurse teacher						
18-In my opinion, the NT was capable of integrating theoretical knowledge and everyday practice of nursing	—	—	0.62	—	—	0.55
19-The NT was capable of operationalising the learning goals of this placement	—	—	0.61	—	—	0.56
20-The NT helped me to reduce the theory-practice gap	—	—	0.71	—	—	0.66
21-The NT was like a member of the nursing team	—	—	0.95	—	—	0.79
22-The NT was able to give his or her expertise to the clinical team	—	—	0.98	—	—	0.81
23-The NT and the clinical team worked in supporting my learning	—	—	0.97	—	—	0.86
24-The common meetings between myself, mentor and NT were comfortable experience	—	—	0.85	—	—	0.72
25-In our common meetings I felt that we are colleagues	—	—	0.85	—	—	0.74
26-Focus on the meetings was in my learning needs	—	—	0.80	—	—	0.73
Leadership style of the ward manager (WM)						
27-The WM regarded the staff on her/his centre as a key resource	—	—	—	0.83	—	0.51
28-The WM was a team member	—	—	—	0.83	—	0.36
29-Feedback from the WM could easily be considered a learning situation	—	—	—	0.63	—	0.51
30-The effort of individual employees was appreciated	—	—	—	0.63	—	0.71
Premises of nursing						
31-The ward nursing philosophy was clearly defined	—	—	—	—	0.61	0.49
32-Patients received individual nursing care	—	—	—	—	0.69	0.63
33-There were no problems in the information flow related to patients' care	—	—	—	—	0.69	0.49
34-Documentation of nursing (e.g. nursing plans, daily recording of nursing procedures, etc.) was clear	—	—	—	—	0.64	0.46

"Fixed" parameters are designated by dashes ("—") and five factor variances are fixed to equal 1.0s thus making the factor covariance equal factor correlation coefficients.

N=354, RMSR= 0.06, SRMSR=0.06, GFI=0.98, Bentler - Bonett NFI=0.98

Average absolute residual=0.05, average off-diagonal absolute residual = 0.05

5.3 STUDY III

The study III population is the same as in study II (student nurses). Study III investigated factors associated with dimensions in the clinical learning environment in PHC units. Overall findings revealed an association between the *pedagogical atmosphere* and which role model students preferred. Nursing students were very motivated and satisfied with the clinical learning environment in PHC units. The highest association study III was between the *satisfaction* and the *pedagogical atmosphere*.

5.4 STUDY IV

Twenty-four DNs were interviewed in six focus groups to gain understanding of supervisors' experiences of supervising undergraduate students in PHC units. Three themes and eight subthemes emerged from the data analysis:

1. *Abandonment*: Insufficient dialogue and support from universities, uninterested management and colleagues.
2. *Ambivalence*: Students as burden – or resource – security and insecurity, and conflict of loyalties.
3. *Sharing a holistic approach in the PHC system*: Learning opportunities from complex nursing situations in PHC – from dependence to independence and finding time for reflection.

Overall, supervisors felt lonely and abandoned in their supervisor role. They lacked support from universities and PHC units, managers, and colleagues. Many supervisors had mixed feelings about supervising students. There were many conflicting emotions among supervisors; they felt that their mission to supervise students was unclear. They were torn between caring for patients and supervising students. Some indicated that supervising students was a burden – just another task on top of all their other tasks. Other supervisors felt that supervising students was rewarding.

They lacked adequate information about the nursing education program and dialogue regarding student tasks and problems that might arise. They did not know what was expected of them as supervisors. At the same time, they were proud to work as DNs and wanted to show students their work in the PHC units, which emphasized a holistic approach toward individuals. The DNs often established long-term relationships with

patients – especially in home care – and this was something that DNs wanted to convey to students. Despite the problems, the supervisors wanted to be well prepared before students arrived, give them a good introduction to PHC, and make them feel welcome.

6 DISCUSSION

The aim of this research was to investigate factors that promote good clinical learning environments in PHC settings. The discussion involves three perspectives. Supervisors' perspectives, i.e., how supervisors experience supervising and conditions for supervising. The second section covers students' perspective and students' approaches to PHC units as clinical learning environments. The last section, "Support from Nurse Teacher," discusses collaboration between universities and PHC units as clinical learning environments.

6.1 SUPERVISORS' PERSPECTIVE

Learning opportunities

Ways in which supervisors perceive their role was very important regarding ways in which they could create conditions for student learning. The results from studies I and IV provided a broad range of factors in clinical learning environments that can complicate and promote student-nurse supervision in PHC units (from DNs' perspectives). Some similar findings from studies I and IV demonstrate and contribute to how DNs and student supervisors perceive their work in PHC units.

Firstly, DNs expressed feelings of pride in being DNs who work independently in their professional roles. Other studies did not report DNs' pride in their role as DNs. In study IV, participants indicated that they feel secure in the professional role – so they dared to lighten control of students and allow them to work more independently with patients. Secondly, participants in study IV wanted to show students the uniqueness of working in the PHC units and that DNs apply a holistic approach to individuals and work independently when they care for patients in their homes, via the home care system. DNs generally work alone in homes – without collegial support – and they often establish sound, long-term relationships with these patients. Findings in the present research were aligned with the Modins study [134], about DNs' solitary, independent work in Sweden's home care system – and how DNs followed patients' conditions very closely and reported changes to family physicians only. As Nygren [39] proposes, by creating sustainable relationships with patients, DNs could help meet patients' needs. DNs describe themselves as patient advocates and say that they function as protectors of patients' interests in the medical care system.

In study IV, DNs' professional experiences during home visits were of interest to students because DNs demonstrate how they know patients' entire life situations, ways in which patients live their lives, and whether or not patients live alone or with their spouses/families. It is valuable for students to see this unique approach and to understand that it's not the same as working in hospitals. So placement in PHC units provides opportunities for students to observe and practice independent work – which enhances, advances, and benefits their professional developing.

To have space and preparation time for student supervision is a critical success factor; if this factor is absent, then the end result might be unsuccessful relationships with students [94, 135]. Study IV participants said that students suffer the consequences if supervisors are unprepared and don't want to supervise a certain student at a certain time. Supervisors said difficulties arose when they were insufficiently prepared. They had, for example, inadequate time and space to help students transform experiences into knowledge and give support and feedback when students asked for it. Supervisors indicated that they needed management support regarding how to prioritize among all duties within the units and that DNs' roles and responsibilities had to be formally documented. The results from study I showed the value of educating and preparing DNs for the supervisor role so that they could become more confident in the role. Hallin [136] supports the need to prepare, educated nurses for their supervisory role and give feedback during nursing education

Clearly mandate to supervise

Planned joint educational encounters that involve nurse teachers, supervisors, and students encourage student supervision. Because student supervision clearly adds additional responsibilities to DNs' daily routines, frequency and types of support that nurse teachers can provide for supervisors must be clarified to help DNs achieve balance between patient care and student supervision. One possible approach might be to provide individualized supervision mandates from management (study I reported an attempt at providing a “mandate” by clarifying the supervisor's role and by appointing one DN at each centre to be a main supervisor to offload other supervisors). Part of the mandate, for example, could specify that DNs with main responsibility for diabetes patients are diabetes specialist nurses (an obvious, well-established role in most Swedish PHC units), i.e., they combined their DN duties and their specialist duties [137].

Willingness to be a supervisor

Being a supervisor in PHC was thoroughly discussed during the interviews and in the study I network meetings in which DNs participated. DNs perceived several factors to be obstacles in PHC learning environments. For example: who becomes a supervisor in the centre? Generally, in studies I and IV, being appointed as a supervisor in a PHC unit is done via a rotation system. A general directive in Sweden was adopted for just that purpose, i.e., each DN in a PHC unit should supervise one student per year.

Participants in study IV expressed that PHC centre managers expected every DN to supervise students – as a natural part of their regular work. Some of DNs discussed if a colleague have no interest to supervise a student, should not undertake this task, they wonder if it right? They thought PHC management should resolve this issue. The expectation was based on a county council mandate for PHC units and does not account for DNs or nurses having opportunities to supervise a student at a given point in time, DNs in study IV felt ambivalence about this responsibility. And this ambivalence might depend on individual DN's responsibilities and the degrees to which they demonstrate that they also have supervisory responsibilities (assignments) and must attend to students as well as patients. One reason for this sense of ambivalence among DNs could be that very little support was given from clinical management during the time students were in the units. As per Bourbonnais [96], clinical managers must attend to clinical staff experiences of the supervisory role in advance.

Who is responsible for students' goal achievements during clinical placement? If there is a new staff (nurse) on the unit, whose responsibility is it to prepare new nurses to supervise students? [138]. Management in clinical settings must discuss the role and its responsibilities, and take advantage of educational potential provided by the universities [3, 139]. To show interest sends good signals to students and their supervisors, namely, that the unit is a favorable place for future work. But discussions must occur on a more general level and must involve dialogue with educational organizations and leaders in clinical settings – regarding how to best supervise and manage students [140], because new, well-educated employees are continuously needed – employees who are willing and able to work in PHC units in the future. Studies I and IV reported that sharing the supervisory role (two DNs sharing responsibility for one student) was desirable. For example, in study I, most supervisors stated that there were benefits if several supervisors manage/work with the students. In

the new supervisor model, a DN was appointed to be in charge of overall supervision; consequently, students received instruction from other supervisors, and the supervisors could share the burden of supervising students while complementing each other during assessment meetings.

These findings are aligned with other studies, which reported that qualified supervisors, colleagues, and nurse teachers should cooperate in assessment meetings [141, 142]. When two supervisors participate together in assessment meetings, then they can give good, objective assessments of students' professional development and competency in clinical placements. This partnership is a way to reduce the supervision burden. In studies I and IV, participants articulated the need for more reciprocal support.

Mårtensson et al.[143] reported the importance ensuring that appointed supervisors receive some support from colleagues. For example, other:

- Nurses – who have no main responsibility for a student – must understand that it takes time to supervise and that they should make things easier for their colleagues (who are supervisors) and thus care for more patients.
- Professionals can provide serendipitous supervision (unplanned supervision, e.g., a student might follow a physician for one day or go to the lab with a nurse's aide)

By sharing supervision, the task isn't so stressful, because DNs need not be alone with this duty and exposed as supervisors.

Support from managers and colleagues

Studies I and IV reported that communicating clearly and getting positive feedback from managers and colleagues are very important – as are perceptions about the supervisory role and dealing with sometimes difficult supervisory situations that might require more support (e.g., unmotivated students or student assessment meeting).

Blomberg et al.[144] support this and contend that involving supervisors, other clinical staff members, and managers creates a supportive learning climate for students – by communicating learning expectations and other problems that arise. It is difficult for supervisors to encourage positive attitudes if managers are involved in the supervisory process to varying degrees. Andrews et al.[3] report that when staff members are taken for granted, they feel neglected and unappreciated by managers.

Results from study I revealed that DNs experienced decent conditions in which to supervise but lacked management support. In study IV, some indicated that they felt torn between their supervisory responsibilities and their patient responsibilities. They said that finding balance between their roles was extra difficult. They had to find their own balance due to insufficient management support; absence of educational strategies for students, PHC management and colleagues, and universities' nurse teachers; and working with students in learning situations changes working-day rhythms (which is unavoidable) [145], so supervision needs to be more organized within PHC units.

Findings reported in this dissertation suggest that student supervision is based more on DNs' past supervision experiences. Daily work directs supervision; so no supervision plan is implemented. One possible reason is insufficient interest and knowledge on the part of PHC unit managers and university stakeholder when it comes to how supervision should be implemented PHC units. This findings is in accordance from a further back study by Pilhammar [146] from hospital settings, which is interesting but also incomprehensible that after so many years that the report was made, do not have much happened.

Reflection and feedback opportunities

To have time for reflection was another valuable factor that emerged in study IV. Reflection is a learning activity in which students increase their knowledge so they can achieve greater understanding of the nursing context. As per Ekebergh [81], learning strategies are necessary for supporting a reflective process that strengthens the transmission between theoretical and practical knowledge. By supporting and giving feedback, supervisors can help students clarify components that comprise good patient care. During reflection meetings with their supervisors, students can learn to reflect, discuss, and debate nursing – and this requires time.

Participants in studies I and IV could, however, find a little time for reflection with the students between home care visits and at the end of the working day when things calmed down. As per Murphy et al.[147], because a student and a DN travel between patients, they get more time for reflection after each patient encounter, which may not always be possible in hospitals.

Schön (1983) mentions an additional aspect of having recurrent reflection meetings, i.e., they are important for increasing levels of competence. And various types of reflection enable achievement of more competence via reflection *in action* and reflection *on action*. Reflection *in action* describes students' abilities to resolve situations while they are happening in the moment, which is based on students' previous experiences; here, it's about student knowledge and action. Schön describes this as "theory-in-use". Reflection *on action* occurs after one educational episode with a student has taken place. This involves dialogue with the supervisor and forces students to think about what they would ideally do if the situation happens again [61]. Based on participants' vivid reflection-session descriptions of supervising students within PHC units during study IV, it's easy to conclude that they generally implement reflection *on action*.

6.2 STUDENTS PERSPECTIVE

Students spend a substantial part of their nurse education in clinical placements. So their perceptions of the clinical part of nursing education in PHC settings are important. This section discusses a range of factors that promote students learning in these settings.

Good role models in PHC units

The main findings from studies II and III were that supervisors serve as significant role models when it comes to students' knowledge acquisition and the supervisory relationship was very important for students who are developing into professional nurses. University nurse teachers did not have the same impact.

In studies I and IV, supervisors' skills, willingness to supervise, and interest in supervising students determine existing supervision – not students' specific professional needs. One possible explanation could be that supervisors in the study felt alone and perceived these factors to be unclear: supervisors' situations, conditions, or circumstances for supervision.

Students' motivation and satisfaction

At the same time, most nursing students in study III were very satisfied overall during clinical placement in PHC units – particularly in association with the supervisory relationship. They were assigned supervisors who created good pedagogical atmospheres and provided a pleasant introduction to PHC units. Students with a

personal supervisor were more satisfied with the supervisory relationship than other students who had several supervisors. So appointing a main supervisor, who a student can have contact with, proved to be important and to encourage learning. The aforementioned findings are aligned with previous studies, which showed that students preferred one main supervisor, which also reduces students' feelings of stress during placement [92, 94, 144]. Here, there is some discrepancy between what the supervisors in study I and IV described.

When several supervisors can share the supervisory role for one student, this sharing was valuable for DNs and reduced the burden of having to attend to students and patients simultaneously. One clarification may be that if main supervisors felt that they received more support from their colleagues, then this support might be sufficient to reduce their feelings of abandonment.

Another main finding in study III was that most students were motivated or highly motivated – when it comes to relationships with supervisors. Students thought that their supervisors generated student motivation. Nasrin et al.[54] reported that nurses, who are good role models, have the most influence on students' degrees of motivation or lack of motivation.

A sense of substantially influenced students' motivation to learn and makes a difference when it comes to student motivation and learning – and how much they learn and want to learn. “Belonging” makes them feel comfortable and welcome within the unit [57]. Clinical placements cannot be realistically provided in a classroom. So real-world experiences during clinical placement are important. Students must often go through many varying degrees of emotions that are related to various types of relationships during placement: with patients, with their supervisors, or with other staff members. Supervisors' attitudes toward students were so important that they had an impact on students' feelings of belonging during placement. If students felt accepted by their supervisors and other staff members, then they would learn more [138].

Positive pedagogical atmospheres in PHC units

In studies II and III, students rated pedagogical atmosphere in PHC units as positive. For clarification, *pedagogical atmosphere* is associated with the psychosocial climate of the unit. Important aspects of a good learning environment are feelings of trust and feelings of security during clinical placement [148, 149]. As per Warne and Mc Andrew [149], these feelings occur when the atmosphere is good, warm, and welcoming – an atmosphere in which students learn to solve problems in a culture with a tolerant character and mistakes are perceived as part of the learning process.

Despite findings from studies I and IV (regarding supervisors' perspectives and difficulties related to supervising students), supervisors tried to ensure that the students felt welcome and that they received a nice introduction to the unit.

Pedagogical encounters

Good clinical-placement quality cannot be underestimated, because quality is essential for development of competent, confident nurses. That said, there are many factors in the learning environment to debate and reflect over [147]. Revealing placement quality requires continuous clinical education evaluation. This is absolutely necessary for ensuring positive student experiences and assuring high-quality clinical placement. Several scales evaluate clinical-learning-environment quality. They might also reveal ways in which students build self-identity – in terms of becoming a nurse – via interactions with patients, supervisors, and other staff members [150]; (e.g., ways in which students rate how nursing principles are implemented during daily work, documentation quality regarding patient care and nursing, and how students perceive learning situation content, particularly related to patient care).

During the present research project, supervisors offered students opportunities to care for some patients; this is positive for learning because students can work independently and establish closer contact with patients in the centre and home care units – with some supervisor assistance. These opportunities, in turn, support student's professional development.

Universities have implemented assessments of this nature via various surveys – mostly on students' experiences of clinical placements; here, the research focused mainly on hospitals. Empirical studies investigated nursing students, nurse teachers, and clinical

staff conditions – in relation to clinical learning environments and supervision systems in Europe. Most studies investigated nursing students’ perspectives. Unfortunately, these studies have not produced a reliable or widespread clinical teaching theory [151].

Warne et al. [28] reported preliminary evidence that supports the importance of providing longer placements for students. The importance of the length of clinical placements has an impact for students’ degree of satisfaction. Longer placements enable closer patient relationships, which encourages developing to become a nurse. A nursing student, who sees the entire nursing process over a longer practice period – with the same patients, acquires clearer understanding of the professional nurse role – compared to students who only participated in a series of fragmented tasks during a shorter placement.

If students receive opportunities to establish longer patient relationships, then the students can learn to recognize essential elements of the caring relationship and become aware of patients’ self-expression of emotions within these relationships. Nursing students in Sweden normally do their PHC clinical practice during a four-week period.

Nursing philosophy clearly defined in PHC units

The combination of good relationship and good atmosphere for student nurses was shown to be very important – as was the premises of nursing (as per the CLES+T scale). In the present research, the “premises of nursing” context of PHC units as learning environments differs from the hospital context. As stated earlier in this thesis, DNs work independently and establish long relationships with patients in their homes. The home milieu is an excellent learning environment for students, and the DNs are supervising the students alone – so the relationship with all three together (student, patient, and supervisor) constitutes unique premises of nursing that vary from hospitals.

This finding deviates from a hospital study in Finland, where students identified the unit atmosphere as the most important element of the clinical learning environment – and not the premises of nursing care on the ward [27, 119]. The present research findings are aligned with a Papastavrou [152], study in Cyprus; here, students described premises of nursing care as being related to the clinical learning environment.

Cultural differences and educational traditions might explain some of these discrepancies – as well as the literature, which is rife with varying definitions of caring [152]. Patient cases in PHC units may be of enormous value for students when it comes to theoretical and practice-based learning, because these cases enable students to analysis, interpret, and discuss (with DNs) inter-relationships within nursing between health promotion, caring, and disease treatments [32].

6.3 SUPPORT FROM NURSE TEACHERS

Other main findings from all four studies were insufficient contacts with universities and lack of clarity regarding nurse teachers' responsibilities toward supervisors and students during clinical placements.

Findings from all four studies reveal that nurse teachers have very little involvement in the clinical part of nurse education. From the students' perspectives, they have less contact with nurse teachers. So PHC supervisors became very important persons for student learning and professional development. Some studies report that nurse teachers are crucial for the students, because nurse teachers must link education and clinical practice [12, 135]. In addition, a good clinical learning environment is encouraged via collaboration between nurse teachers, supervisors, and other staff members [12, 120].

DNs in studies I and IV lacked adequate information from the universities regarding what students were expected to do during placement. No information was forthcoming regarding changes in nursing education and what the educational objectives were for the clinical placement in PHC units. So the supervisors felt abandoned in their role of supervising students. This clearly indicates lack of collaboration between universities and responsible supervisors from the “real world” in medical care – regarding how caring sciences can be integrated. New research and development was excluded from daily work in hospitals (this became someone else's responsibility), so students fall somewhere between these two areas [22].

Results from study I show that universities play a key role in preparing and educating supervisors for their supervisory role. This facilitates greater understanding of what it means to supervise students. Although the implementation period for the supervision model was short, improvements were made in clinical course organization (e.g.,

assigning supervisory roles and sending out updated information packages to students). But results from study I pointed out that better *cooperation* between PHC unit supervisors and university nurse teachers was necessary – as well as *support* from nurse teachers and clinical management. Change, however, takes time to achieve, and this kind of approach requires support from good, pre-existing working relationships and university involvement.

Another nurse teacher issue worth discussing is assessment of student learning during practice – especially assessment of students’ performances, which most supervisors perceived to be problematic (studies I and IV). That is always necessary for a teacher to be involved in assessment meetings, especially the final assessment discussion. A nurse teacher can give constructive feedback to supervisor and student [153].

Results from study I led to network meetings in which DNs (main supervisors) received training/information from nurse teachers about supervising students. DNs could ask questions in the meetings and discuss the supervisor role (e.g., DNs learned what they should focus on during assessments). Another finding worth discussing is the low academic competence level of nurses or DNs in the present research. Most became certified before the new, higher academic level was introduced into nursing education.

This is aligned with a Löfmark study [154]. Master’s level specialist nurse education within PHC was only recently instituted. And the consequence of this may be a reason why study participants did not feel qualified enough for student supervision (they felt that they could not optimally assess students). Here, nurse teachers play an important role for assuring good assessments; in addition, it’s always essential that nurse teachers participate in final assessment discussions. To attend and to give support to supervisors in assessment meetings makes things easier for students and supervisors [153].

A Barrett [155] study indicated that there is a lack of strategic management regarding the role of nurse teacher, and that it is unrealistic to expect them to simultaneously research, teach, and switch between clinical and managerial roles. Lack of strategic management may also contribute to difficulties between academic and clinical areas, whereby nurse teachers and supervisors feel abandoned by their respective organizations regarding their roles and responsibilities. According to participants in

study IV, this generated considerable uncertainty and frustration regarding student supervision.

Trying new educational strategies – to enhance cooperation between universities and clinical placements – can trigger consensus among all stakeholders associated with students' clinical education [12, 13]. For example, when evaluating implementation of a new supervision model in study I, four factors emerged (holding seminars in PHC units were one factor). Clinical educational facilitators and nurse teacher were responsible for these seminars, whose purpose was to link theory and practice. The attempts to educate supervisors for their role as a supervisor and introduce learning seminars in PHC units where supervisors, their students, nurse teacher and other representatives from the university participated, showed that it had positive effects and increased supervisors' knowledge about supervising students and giving more insight into the nursing program.

A Löfmark et al.[156] study that ran at the same time as study I – but from the students' perspective – demonstrated that holding educational seminars in PHC units – rather than at universities was considered valuable for students. During these seminars, students, main supervisors, DNs from other PHC units, and nurse teachers discussed students' learning situations with patients who had complex problems and complex care requirements. These knowledge exchanges proved to be valuable for all participants.

In sum, many factors which can promote a good learning environment in PHC were identified. The pedagogical atmosphere in PHC units was described as good based on students' experiences. One of the key constructive factors was supervisors' willingness and engagement to create a positive interpersonal relationship with the students who they were asked to supervise. It appears that students learn nursing by observing DNs, who were perceived to be good role models. Several factors based on supervisors' experiences highlight the challenges in good clinical learning environment for examples due to support from nurse teachers managers and colleagues. The supervisory role is still a very vague, unclear role, which makes them feel certain ambivalence toward the mission to supervise students.

6.4 METHODOLOGICAL ISSUES

The present research applied three quantitative approaches and one qualitative approach. The methods correspond to specific research objectives. Studies I and IV (supervisors) complemented each other by using quantitative and qualitative methods to increase knowledge and deepen understanding of supervisors' experiences – thus providing richer data sets than studies II and III. Studies II and III used only a quantitative method, which according to Polit and Beck [114] emphasizes measurable properties of phenomenon that should be examined.

Studies' I and IV participants (DNs and nurses) were recruited only from Stockholm, a typical urban area. In being typical, this might limit/slant research findings. On the other hand, the land area served by the Stockholm County Council is large, and participants came from rural *and* urban areas, which can be strength in that geography facilitates a broader selection of participants.

During the first study, the questionnaire development was based on research group members' experiences with three areas that the questionnaire covered and literature that existed at that time (i.e, very few research reports from PHC were available). When developing questionnaires, there's always risk that important issues are overlooked or too difficult to interpret in questionnaire statements that study participants must respond to. To avoid such risk, an expert group of DNs discussed the three areas to determine their relevance and reviewed the statements/questions. No comparison group was used in this study. According to Polit and Beck [123] one group before- after design is not always unproductive. It may be reasonable to conclude that the intervention is the most plausible explanation for knowledge gains.

The Studies II and III deal with nursing students. While these studies provided useful, interesting information, several limitations must be noted. The study population was small. However, method literature [123] suggest researchers in factor analysis include at least four measured variables for each measured variables. In the study II the sample size was 356 and factor analysis based on 34 variables in CLES+T scale, which is sufficiently large size. Purposive sampling was used. Recruitment of a limited selection of students from Stockholm and from only one university in Sweden may have had an impact on the results, which, in turn, precludes generalization.

It can be some weakness to select CLES+T scale as an instrument. Richardson (2004) [157] indicates that content validity is situation- specific. Part of the problems with CLES+T scale can be that the research context in which the scale was devised has been changed over the years. (The CLES+T scale was undertaken during 2002 and 2008). For examples the forms of expression in supervisory relationship in the CLES+T scale “*My supervisor showed a positive attitude toward supervision*” and “*I continuously received feedback from my supervisor*” are assumed to the pedagogical approach where one student has one supervisor. Today when learning theories focus on students’ responsibility for their own learning and their active role for self-learning, several supervisors as a role model could provide variety in reflecting own professional development. Further the CLES+T scale does not take account the ward unit as a learning environment where possibly other students can be a part of opportunities for learning (peer learning). As per Soemantri et al.[158], the scale was identified to be the best suitable tool for assessing students’ perceptions of their clinical placement due to the fact that content and construct validities of CLES+T are well established, maybe it is needed to update the scale.

Quantitative researches are assessed by their validity and reliability. Validity is a degree to which an instrument measures what it is supposed to measure. To ensure face validity in study II, an expert panel (DNs from PHC units) reviewed the statement on the scale to ensure that they were relevant for the study’s area. This phase was needed for persuading people to participate in a study if the instrument being used have face validity [115]. Factor analysis was used to measure construct validity in study II. Construct validity plays a crucial role in ensuring scale validity [115].

The reliability of a quantitative instrument is a major criterion for assessing its quality. The less variation an instrument produces in repeated measurements, the highest its reliability [115]. In studies II and III Cronbach’s alpha was used to calculate the reliability (internal consistency) and high value over 0.90 indicated it is a valid instrument. The minimum (acceptable) value is 0.90 [114]. It can be seen as a strength that the CLES + T scale has been earlier validated several research processes round the world indicating a high validity and reliability [148, 159-162].

In the study II, for validation of the CLES+T scale exploratory factor (EFA) and confirmatory factor (CFA) analysis have been used. EFA is often used as a first phase of scale development and construct validation processes. The original CLES+T scale was undertaken during careful research process, so the measured variables from the domain were relevant. In contrast to EFA, CFA is normally used in later phases when the underlying structure has been adopted on empirical and theoretical grounds [163]. We have not found any previous studies where researchers have used both EFA and CFA within the same sample.

The purpose of group interviews for study IV was to deepen understanding of supervisors' experiences and complement study I results. This method provides many advantages, namely, it *(i)* is rigorous and captures an extensive range of participants' thoughts, experiences, and attitudes, *(ii)* gives interviewees control and anonymity and *(iii)* helps to clarify participants view and attitude during interpersonal communication [164]. The aim was to stimulate each interviewed DN to come into the discussion about experiences from student supervision in PHC units – to get richer, more extensive data on the subject. Group interview limitations include the inability to reach each person in a deeper sense – to find out what the individual would like to talk about. And, as in all groups, some participants can be more dominant and take over the situation. Successful data collection depends on the group dynamic during the interview and how interviewees inspired each other [165].

The strength of studies I and IV was the participants who had long experiences to work as a DNs and as a supervisor in several PHC units, not closely each other. Krueger and Casey [165] emphasize importance of homogeneity in the groups. They are critical of the use of groups where participants know each other well and work closely with each other. The interview guide was developed by applying the result from the first study and by reading literature. Discussion in the research group of the research topic before data collection facilitated identification of inherent biases. A pilot interview was carried out with the purpose to test the interview guide [129].

To ensure confirmability the interviewer carefully listened to supervisors' responses, asked for clarification if needed and observed the conversations with the help of another researcher. The research group members analyzed the interview material independently. They discussed whether or not more information was needed. To

enhance transferability, characters of the participants, the nature of interviews and process of analysis have been attempts thoughtfully describe.

7 CONCLUSIONS

Overall aim of thesis was to identify factors that promote good clinical learning environments in PHC settings by highlighting the nursing students and the supervisor's experiences on primary health care as a clinical learning environment. This thesis brings to light the six main factors (Figure 1) that can promote students' learning in PHC.

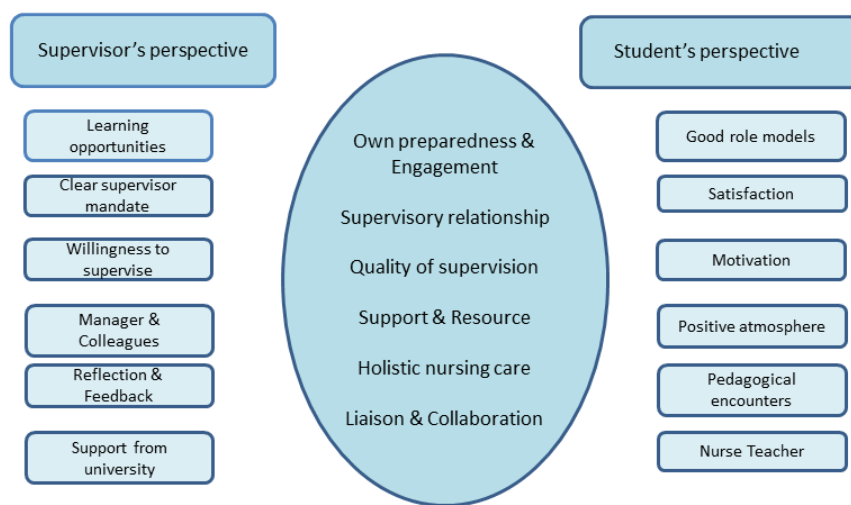


Figure1. The six main factors derived from the empirical studies. Based on supervisors and students experiences in studies I-IV

Supervisory relationship has shown to be the most important factor associated with positive pedagogical atmosphere where nursing students experience support during clinical placements. Although they receive support from different actors, the support provided by supervisors in PHC is considered the most significant in PHC.

The results indicate the supervisor's great of importance to students, how supervisors despite some difficulties try to prepared themselves before the student arrival to PHC and create a good atmosphere and learning opportunities for students, but also how student- supervisor relationship can have impact on student motivation during student placement and the students were generally satisfied with their placements in PHC.

District nurses believe they have the potential to show their profession to students because they are secure in their work and role as district nurses and believe that PHC has a lot to offer for the students' learning as holistic view, continuity, and offers home health care with close relationships with patients with mixed ages. The students expressed there are good premises of nursing in PHC and the PHC nursing philosophy was clearly defined. They get the opportunity to work in an independent approach with patients in home care and meet and give care to patients from cradle to grave.

The development of a clearer professional identity/mandate is crucial if educational preparation is to be tailored more specifically to the needs of those undertaking a clinical educator role. In this thesis the supervisors felt that they wanted to stay more up to keep-up-to- date and to gain insight about changes in nursing education curricula to could give good support to students how coming to do their clinical education in PHC. District nurses wish, however, have increased knowledge of the requirements and objectives, and set not only for student learning but also for district nurses themselves in the role of supervisors, as they believe today that the directives are very vague, both from its own organization and from the universities organization.

Supervisors need help with both supports from management and prioritize their duties. To supervise students perceived as a vulnerable position considered supervisors and several of the district nurses were ambivalent about the supervision -assignment. They need for example more engagement from their colleagues. The supervisor may double features and includes sudden in two organizations with requirements from universities to supervise a student in same time while practicing their profession and caring for patients.

The issue of responsibility on the supervision of students in general needs to be emphasizing more. To supervise students is made today a little alongside the patient work. It is therefore important to developing the supervisors' role and does this role more visible.

There is need for collaborative partnership within health care organizations and educational institutions to find and enhance best clinical education placements, to make regular evaluations of placements with valid tools can be a help with this process.

CLES+T evaluating instrument for clinical education is a valid tool for using in PHC context and it is the first evaluating instrument which has been tested in PHC context. The CLES+T scale is a reliable tool to use for evaluating PHC as a clinical learning environment. It can be argued that CLES+T are a valid instrument for future research in these settings. Continuous evaluation is important to investigate the quality of the clinical learning environment as perceived and experienced by the students.

8 IMPLICATIONS AND FURTHER PERSPECTIVES

This thesis brings attention to four studies about students and supervisors perceptions of PHC as a clinical learning environment. The deficiencies concerning supervision in PHC identified in this thesis require some improvements. The proposals on seven main factors can hopefully form the basis for these improvements. In the meantime the research has progressed raised many new questions which require further research among supervisors role to supervising nursing students in this settings.

To handle students' in a professional manner as a supervisor in clinical settings, must give more attention. A question for the future in which way the management in PHC can provide DNs better support in the supervision of students? In an organization that is so open-minded where district nurses or nurses have opportunities to be educate and develop their supervisor role in collaboration with PHC manager, will benefit students learning.

This research would help establish a system for quality assurance of the clinical learning environment in PHC settings and generate valuable insights for supervisors and faculty on how to best-and organize clinical education in these settings. It is necessary to have better liaison and communication between those responsible for the clinical part of the nursing program, to ensure high quality clinical learning environment.

CLES+T scale are shown to be a valid and reliable tools which to measure effectiveness of factors in clinical education. The results from study II improved a good five factors model of CLES+T scale which could be useful into PHC environments. It offers valuable information about student's perceptions of the clinical learning environment in the PHC to universities and can be use when planning educational programs for nursing students in PHC.

It would be interesting for future studies to include supervisors' responses to the same scale (CLES+T scale). Before the scale is used in the future, it need be adapted to current prevailing teaching and learning objectives. Hopefully, it will provide a broader spectrum for completing the picture created by the five factors in CLES+T scale, which relate to clinical learning environments in PHC units.

Relative few studies before have provided supervision model that can help and guide the development of quality clinical learning environments. In PHC units the implementation of the new supervisor model in study I were among other the pedagogical seminars were much appreciated. These may improve communication linkages between and provide a liaising component to all involved. Even though it was a small study, showed that a good result and can serve as a pilot study, before more examination on a larger scale, where this model can be developed and used by today's standards of learning.

In the future we need additional studies from other perspectives of the clinical learning environment in PHC; such as different supervision models, what, how and different ways in which students learn and other clinical staff importance for learning. Further studies are needed even to explain the complexities of the relationship between supervisors, students, patients and staff at the faculty as a clinical learning environment in PHC.

9 SUMMARY IN SWEDISH/SAMMANFATTNING PÅ SVENSKA

9.1 BAKGRUND

Utbildningen till sjuksköterska innehåller både en teoretisk del och klinisk del, cirka hälften av sjuksköterskeutbildningen består av verksamhetsförlagd utbildning som genomförs inom varierande hälso- sjukvårdsområden. Utbildningen leder till en yrkesexamen (legitimation som sjuksköterska) och till en kandidatexamen inom omvårdnad. Sjuksköterskestudenter genomför en klinisk del av utbildningen bl.a. inom primärvårdens olika enheter och miljöer såsom vårdcentralers mottagningar, hemsjukvården, barnhälsovården och i viss mån även på mödravården. Föreliggande avhandling utgår från en modell där distriktssköterskor/specialistsjuksköterskor eller sjuksköterskor som arbetar inom de olika enheterna, i flesta fall handleder studenter individuellt. Utgångspunkten för studenters kliniska lärande är de pedagogiska mötena med olika patienter och deras anhöriga/familjer, handledare samt samarbete med olika professioner.

Verksamhetsförlagd utbildning (VFU) har en stor betydelse för studentens lärande och utveckling i sin yrkesprofession. Syftet med den verksamhetsförlagda utbildningen är att sjuksköterskestudenten ska tillägna sig, tillämpa och integrera teoretiska kunskaper med praktiska lärsituationer, samt utveckla ett professionellt förhållningssätt för en framtida roll som yrkesverksam sjuksköterska. Den forskning som finns om verksamhetsförlagd utbildning är baserad på den kliniska delen inom sjukhusvård, få studier är gjorda inom primärvårdens kontext.

9.2 SYFTE

Denna avhandling fokuserar på sjuksköterskestudenter och handledares uppfattningar av den kliniska delen av sjuksköterskeutbildningen inom primärvårdens område. Det övergripande syftet med avhandlingen var att identifiera faktorer i den kliniska lärande miljön inom primärvården, som baseras på sjuksköterskestudenters och handledares perspektiv.

9.3 FYRA DELARBETEN

Avhandlingen består av fyra delarbeten, tre kvantitativa studier (I,II och III) och en kvalitativ studie (IV). Studier I och IV baseras på distriktssköterskors erfarenheter Delstudier II och III baseras på sjuksköterskestudenters erfarenheter av den klinisk lärande miljön inom primärvården.

Delstudie I syftet med denna studie var att undersöka distriktssköterskors (DSK) erfarenhet att handleda sjuksköterskestudenter inom primärvård, före (98/133 distriktssköterskor från 22 vårdcentraler) och efter (84/130 distriktssköterskor från 17 vårdcentraler) implementering av en ny handledningsmodell. Modellens utvärdering baseras på en forskningsgruppens framtaget frågeformulär som skickades ut före och efter en utbildningsintervention (12 träffar) till distriktssköterskor/sjuksköterskor som handledt sjuksköterskestudenter på olika vårdcentraler i Stockholms område. Resultatet visade att före interventionen saknade handledarna en uppdaterad information om studenternas uppgifter under VFU och mål. De hade svårigheter att använda bedömningsformulär för att bedöma studenters lärande. De uttryckte behov av stöd på olika sätt, bland annat saknade de stöd från arbetsgivaren (verksamhetschefen på vårdcentralen), från kollegorna och från läraren på de olika universiteten. Efter interventionen upplevde många handledare förbättringar, bland annat organisation kring studenters handledning blev bättre och handledarna kände sig säkrare i handledarrollen.

Delstudie II syftet var att validera ett instrument för evaluering av klinisk lärande miljön. Frågeformuläret "Clinical Learning Environment, Supervision, and Nurse Teacher" CLES+T valdes på grund av att instrumentet hade visat ha hög validitet och reliabilitet i flera mätningar i flera olika internationella studier och även en nationell studie. Vid planering av denna studie fanns det inget validerat instrument från primärvårds perspektiv, CLES+T instrumentet var översatt på svenska och validerats inom kontext av sjukhus i Sverige. Sjuksköterskestudenter (n= 356) från ett universitet besvarade enkäten en vecka efter deras VFU inom primärvården, materialet analyserades med psykometriska tester; först med exploratorisk (EFA) och därefter konfirmatorisk (CFA) faktoranalys. Dessa analysmetoder användes för att bedöma sambanden mellan de latent konstruktioner som erhållits från den preliminära EFA, i syfte att klargöra om det fanns en gemensam struktur för dessa faktorer och bekräfta resultaten från EFA. Resultatet visade att CLES +T instrumentet med fem faktorer är

valid instrument inom primärvården. Faktorer som relation mellan handledaren och studenten (supervisory relationship) samt pedagogisk atmosfär i primärvårdens enheter (pedagogical atmosphere) blev högst bekräftade och betydelsefylla.

Delstudie III syftet var att undersöka om studenters motivation, övergripande tillfredställande och erfarenheter av den professionella rollmodellen har samband med dimensionerna i den kliniska lärandemiljön som CLES+T instrumentet har visat sig har tagit fram i delstudie II. Materialet analyserades med hjälp av uni och multivariata analysmetoder. Resultatet visade att det fanns ett klart samband mellan relation till handledaren och studenten (supervisory relationship) och studenters upplevelse av egen motivation. Studenterna var både motiverade och nöjda med sin kliniska placering i primärvården. Majoriteten av studenterna ansåg att handledaren var deras professionella rollmodell.

Delstudie IV syftet med denna studie var att få en djupare förståelse för förutsättningarna för sjuksköterskestudenters kliniskt lärande som baseras på handledares (distriktssköterskors) erfarenheter. Sex fokusgruppsintervjuer med 24 deltagare genomfördes med hjälp av intervjuguiden och analyserades med hjälp av kvalitativ innehållsanalys. Resultatet utmynnade i tre övergripande teman; (1) De känner sig *överburna* från ledning, kollegor och universiteten, (2) De känner *ambivalens* inför uppdraget att handleda studenter, eftersom uppdraget att handleda upplevs mycket oklart och vagt. De vill däremot (3) *gärna dela med sig av det holistiska synsättet från primärvårdens område* till studenterna, eftersom de känner sig stolta att vara distriktssköterskor och vill visa upp det unika med att vårda patienter i patienters hemmiljö i hemsjukvården.

9.4 SLUTSATSER

Denna avhandling visar sex huvudfaktorer som främjar en god klinisk lärande miljö i primärvården utifrån studenter och handledarnas perspektiv. De fyra delstudierna visar på att handledarna trots alla brister tar väl hand om studenterna. En nära, reflekterande handledarrelation mellan studenten och handledare är en av de viktigaste faktorerna för lärande inom primärvårdens område. Handledarna var förberedda och engagerade, studenterna kände sig motiverade och nöjda. För att primärvården fungerar som en god klinisk lärande miljö krävs en tydlig struktur och organisation för handledning och att handledare har ett tydligt mandat för handledning. Det behövs klar och bestämt stöd

från ledningen och kollegor på vårdcentralen.Handledarna behöver kontinuerlig handledarutbildning, ha avsatt tid för handledning, samt införa strukturerad handledarmodell för handledare. Det behövs samarbete och samverkan mellan universitet och primärvården för att integrera teoretiska och praktiska delarna sjuksköterskeutbildningen. Primärvården bidrar till holistisk omvårdnad, vilket är en viktig faktor för studenternas lärande. Utvärderingsinstrumentet CLES + T visar sig vara ett pålitligt verktyg att använda för att utvärdera primärvården som en klinisk lärande miljö.

I framtiden behöver vi ytterligare studier från flera perspektiv; om olika handledarmodeller, hur studenter utvecklas och lär sig att bli en professionell sjuksköterska, men även mer studier vad annan klinisk personal har för betydelse för lärandet. Ytterligare studier behövs även för att förklara komplexiteten i relationen mellan handledare, studenter, patienter och personal från universiteten inom primärvårdens kontext.

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11 ETHICAL CONSIDERATIONS

This research project has followed the ethics principles thoroughly in accordance by the Helsinki Declaration. All the studies in this thesis were approved by the Ethical Committee at Karolinska Institute for study I (registration number 508/03). For the study II-IV by Research Ethics Committee, Karolinska Institute (Um dnr: 2007/1531-31/3). This approval included the design of all studies.

In study I and IV written information and verbal explanation of the purpose of the study were given to the managers in each PHC centre, before the questionnaire (study I) they gave permission to carry out the study and DNs /nurses could participate in the study. Managers and DNs/ nurses were informed about assurance of maintenance of confidentiality and anonymity. After approval of manager the DNs /nurses were contacted by mail and were sent information's sheet about the study. The DNs /nurses who voluntary participated in the studies could withdraw at any time they wanted.

In study II – III Initially, the headmaster involving in the nursing program in the university were contacted by mail with written information about the studies. After the approval of headmasters, the questionnaire distributed to the nursing students who had just completed their clinical placement in primary care. Before complete the questionnaire the students had been informed about the study and that they could complete the questionnaire anonymously. After they completed the questionnaire, we collected these immediately and maintained of them locked up in the working unit. All data were handled anonymously.

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