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CLINICAL LEARNING ENVIRONMENT AND SUPERVISION
Development and validation of the CLES evaluation scale

by

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CLINICAL LEARNING ENVIRONMENT AND SUPERVISION
Development and validation of the CLES evaluation scale

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Mikko Saarikoski

CLINICAL LEARNING ENVIRONMENT AND SUPERVISION

Development and validation of the CLES evaluation scale

University of Turku, Department of Nursing Science

2002

ABSTRACT

The purpose of the study was: (1) to describe how nursing students' experienced their clinical learning environment and the supervision given by staff nurses working in hospital settings; and (2) to develop and test an evaluation scale of Clinical Learning Environment and Supervision (CLES).

The study has been carried out in different phases. The pilot study (n=163) explored the association between the characteristics of a ward and its evaluation as a learning environment by students. The second version of research instrument (which was developed by the results of this pilot study) was tested by an expert panel (n=9 nurse teachers) and test-retest group formed by student nurses (n=38). After this evaluative phase, the CLES was formed as the basic research instrument for this study and it was tested with the Finnish main sample (n=416). In this phase, a concurrent validity instrument (Dunn & Burnett 1995) was used to confirm the validation process of CLES. The international comparative study was made by comparing the Finnish main sample with a British sample (n=142). The international comparative study was necessary for two reasons. In the instrument developing process, there is a need to test the new instrument in some other nursing culture. Other reason for comparative international study is the reflecting the impact of open employment markets in the European Union (EU) on the need to evaluate and to integrate EU health care educational systems.

The results showed that the individualised supervision system is the most used supervision model and the supervisory relationship with personal mentor is the most meaningful single element of supervision evaluated by nursing students. The ward atmosphere and the management style of ward manager are the most important environmental factors of the clinical ward. The study integrates two theoretical elements - learning environment and supervision - in developing a preliminary theoretical model.

The comparative international study showed that, Finnish students were more satisfied and evaluated their clinical placements and supervision with higher scores than students in the United Kingdom (UK). The difference between groups was statistical highly significant ($p= 0.000$). In the UK, clinical placements were longer but students met their nurse teachers less frequently than students in Finland. Arrangements for supervision were similar.

This research process has produced the evaluation scale (CLES), which can be used in research and quality assessments of clinical learning environment and supervision in Finland and in the UK. CLES consists of 27 items and it is sub-divided into five sub-dimensions. Cronbach's alpha coefficient varied from high 0.94 to marginal 0.73. CLES is a compact evaluation scale and user-friendliness makes it suitable for continuing evaluation.

Keywords: nurse education; clinical learning environment; supervisory relationship; instrument development; concurrent validity; test-retest

Mikko Saarikoski

**KLIININEN OPPIMISYMPÄRISTÖ JA OHJAUS
CLES evaluaatiomittarin kehittäminen ja validointi**

Turun yliopisto, Hoitotieteen laitos

2002

TIIVISTELMÄ

Tutkimuksen tarkoituksena oli (1) kuvata sairaanhoitajaopiskelijoiden kokemuksia sairaalan vuodeosastoista kliinisen opiskelun oppimisympäristöinä sekä opiskelijoiden kokemuksia hoitohenkilökunnan toteuttamasta ohjauksesta sekä (2) kehittää ja testata kliinisen oppimisympäristön ja ohjauksen tutkimiseen ja arviointiin soveltuva mittari (**CLES**, *Clinical Learning Environment and Supervision evaluation scale*).

Tutkimus toteutui kolmessa vaiheessa. Pilottitutkimuksessa (n=163) selvitettiin vuodeosaston ominaispiirteiden ja kliinisen oppimisympäristön välistä yhteyttä. Mittaria kehitettiin edelleen (1) pilottitutkimuksen tulosten, (2) asiantuntijajaneelin (n=9 hoitotyön opettajaa) ja (3) uusintamittaustestin (n=38 hoitotyön opiskelijaa) avulla. Näin muokattu mittari testattiin tutkimuksen suomalaisessa pääaineistossa (n=416). Tässä vaiheessa käytettiin mittarin validiteetin arvioimiseksi rinnakkaismittaria (*concurrent validity instrument*, Dunn & Barnett 1995). Kansainvälinen vertailututkimus toteutettiin vertaamalla em. aineistoa Englannista koottuun lisäaineistoon (n=142). Kansainvälinen vertailu katsottiin aiheelliseksi kahdesta syystä. Istru-mentin kehittämisessä kansainvälinen vertailu on tärkeää, koska sen avulla saadaan kokemuksia mahdollisista kulttuurisista eroista, joihin kirjallisuudessa viitataan. Toisena syynä oli kehitetyn mittarin arviointi myös yhtenäistyvien koulutus- ja työmarkkinoiden näkökulmasta; Euroopan Unionissa on ilmeinen tarve vertailla eri kansallisia koulutusjärjestelmiä.

Tulosten perusteella yksilöohjaus ja siihen sisältyvä henkilökohtainen ohjaaja ovat tärkeimmät yksittäiset kliinisen ohjauksen osatekijät. Keskeisiksi oppimisympäristössä vaikuttaviksi tekijöiksi havaittiin myös osastolla vallitseva ilmapiiri ja osastonhoitajan johtamistapa. Tutkimus vahvistaa ja yhtenäistää aikaisempaa kliiniseen oppimisympäristön ja ohjauksen teoria siinä määrin, että on mahdollistaa esittää tätä tutkimuskohdetta kuvaava alustava teoreettinen malli.

Kansainvälisessä vertailututkimuksessa suomalaiset opiskelijat olivat tyytyväisempiä ja he arvioivat oppimisympäristönsä ja saamansa ohjauksen korkeammilla pistemäärillä, kuin brittiopiskelijat. Ryhmien välinen ero oli tilastollisesti erittäin merkitsevä (p= 0.000). Englannissa kliinisen opiskelun jaksot olivat pidempiä ja opiskelijat tapasivat ohjaavan opettajan huomattavasti harvemmin kuin suomalaiset opiskelijat. Muut ohjattuun harjoitteluun liittyvät tekijät olivat jokseenkin samanlaiset.

Tutkimusprosessi on tuottanut arviointimittarin, jota voidaan käyttää tutkimusvälineenä sekä kliinisen oppimisympäristön ja ohjauksen laadun arvioinnissa. Kehitetty mittari on reliaabeli (Cronbachin alfa-arvot 0.73-0.94) ja validi tutkimusväline, joka soveltuu osaksi hoitotyön koulutuksen arviointia niin Suomessa kuin Englannissakin. CLES koostuu viidestä summamuuttujasta ja siinä on yhteensä 27 väittämää. Se on helppokäyttöinen arviointiväline ja siksi käyttökelpoinen kliinisen oppimisympäristön ja ohjauksen jatkuvassa arvioinnissa.

Avainsanat: hoitotyön koulutus, kliininen oppimisympäristö, ohjaussuhde, mittarin kehittäminen, samanaikaisvaliditeetti, uusintamittaustesti

LIST OF ORIGINAL PUBLICATIONS

This academic dissertation is based on the following publications, which are referred to in the text by their Roman numerals from I to IV:

I

Saarikoski M. & Leino-Kilpi H. 1999. Association between quality of ward nursing care and students' assessment of the ward as a learning environment. *NTresearch 4*: 467-474.

II

Saarikoski M. & Leino-Kilpi H. 2002. The clinical learning environment and supervision by staff nurses: developing the instrument. *International Journal of Nursing Studies 39*: 259-267.

III

Saarikoski M., Isoaho H. & Warne T. 2002. Evaluating the clinical learning environment and supervision. A comparison of two research instruments. Submitted.

IV

Saarikoski M., Leino-Kilpi H. & Warne T. 2002. Clinical learning environment and supervision: testing a research instrument in an international comparative study. *Nurse Education Today 22*: 340-349.

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In this e-version the original publications have been given only as the references.

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- Appendix 2.** Kysymyslomake kliinisellä opiskelujaksolla olleelle opiskelijalle (CLES - Finnish version)
- Appendix 3.** Questionnaire for student who has taken part in clinical training on the hospital bed ward (CLES - English version)

Appendices are available in the paper version of this thesis or from the author by e-mail: mikko.saarikoski@turkuamk.fi

1 INTRODUCTION

In Finland, the locus of nurse education has shifted from nursing colleges to multi disciplinary polytechnics. Many parts of the educational system have been subject to careful analyses in order that transitions build upon the best of the old system and reject the worst of the previous system. The use of research and comparative international studies, in the context of clinical teaching, have been a crucial element in this process reflecting the changes made in other European nurse education systems. For example, in the United Kingdom (UK) the pre-registration nurse educational system transition to universities has been due to changes in the arrangements for clinical teaching. Such changes are congruent with changes in the Finnish nurse educational system.

The prompt for this study was that in Finland, there is not a valid research instrument available to study clinical learning environments and supervision. Some empirical studies have been done but the data collection tools used in these studies were developed only for the appropriate studies with little generalisability of methodology and outcomes evident. Also in the international nursing literature, there are only limited numbers of tools available to evaluate the quality of nurse education system in clinical practice (Marriott 1991; Fisher & Parkinson 1998; Roberts et al. 2001).

An additional issue to consider is clinical teaching and supervision practices have national contextual dimensions and evaluation tools developed in other cultural contexts can be invalid for use outside of the original environment (Chan 2001; Suen & Chow 2001). It was in seeking to respond to these issues that resulted in the original development of a research instrument, which was piloted and evaluated earlier in Finland (Saarikoski 1995). In this report, the development process of an evaluation scale reflecting both international and Finnish literature will be described.

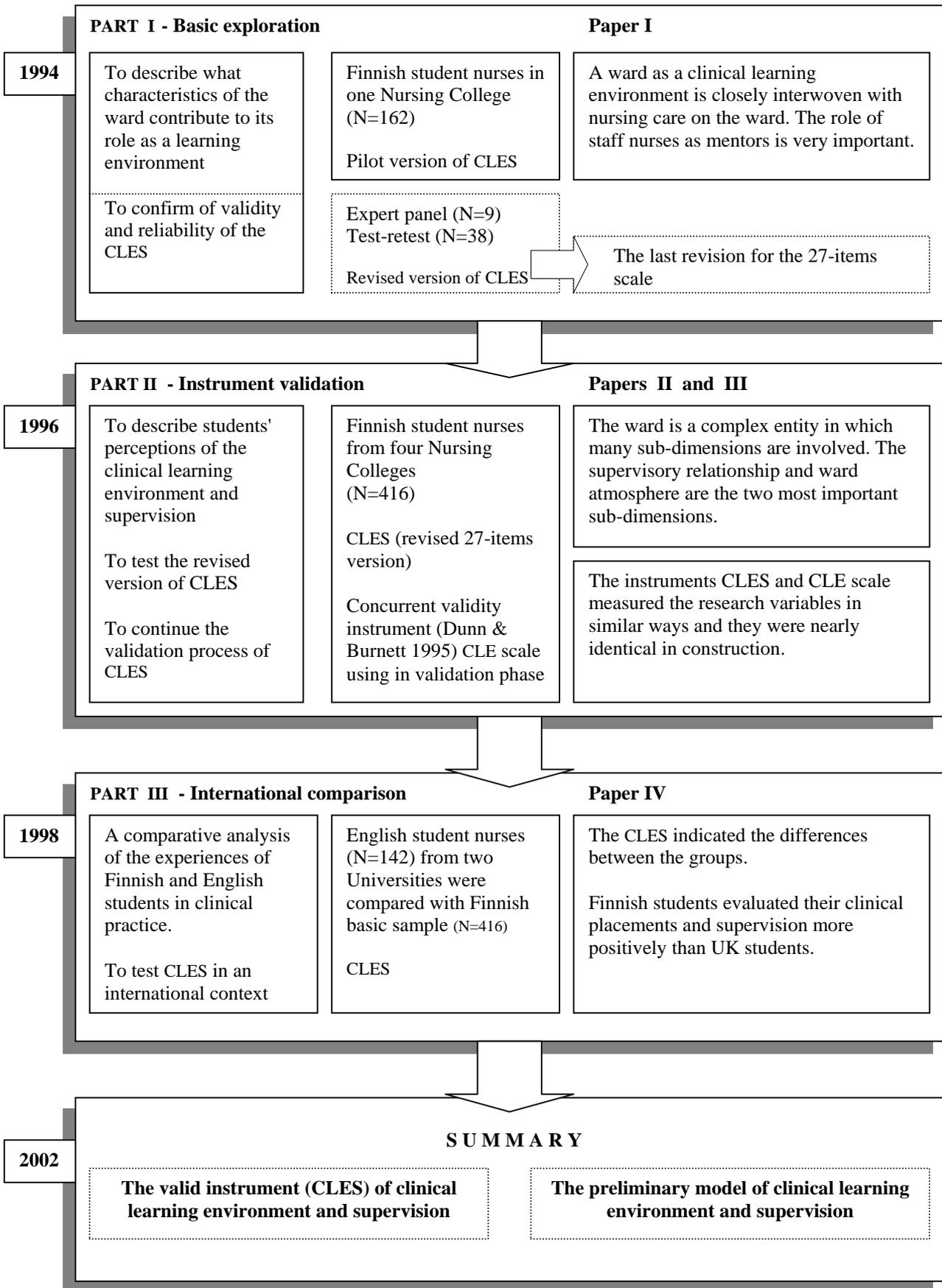
The approach adopted in this study is quantitative. A quantitative approach is required if the research area is broad and the aim of the study is to generate and refine theory and build constructs (Burns & Grove 1997). Clinical teaching and learning in nurse

educational systems have been examined from different perspectives during the last two decades. However, the studies have not produced a consistent theory of clinical teaching.

One perspective of many of these studies has been to determine factors contributing to students learning in the clinical placements: what is the important aspect of clinical learning environment and supervision system in clinical studying? The clinical learning environment and supervisory systems have been considered in nursing research from three different subjects: student nurses, teachers and qualified staff. The focus of this study is on the contributing factors involved in clinical learning on a clinical ward considered from the viewpoint of the student. The contributions of nurse teachers have been examined to a limited extent in one paper (Paper IV) in which the contact frequency of nurse teacher was used as a background variable. However, the major element (91%) of the empirical studies considered the clinical learning environment through the students' unique experience (Saarikoski 1998). This is easy to understand because learning is a sensitive process, which can be easily affected by environmental factors. The subject's unique experience is an appropriate instrument with which to evaluate the quality of clinical learning environment and supervision.

The purpose of this study is to describe how nursing students' experiences their clinical learning environment and the supervision given by staff nurses, assessing what areas of congruence there might be across the different elements of a clinical ward what are experienced by the student. The clinical ward is a very complex entity, made up of the ward culture, practices of nursing care, management system etc. In recognition of this complexity, the study was used to develop the Clinical Learning Environment and Supervision (CLES) evaluation scale - being the second main purpose of this study. The process started during the middle of the 1990's with a pilot study (Paper I), which explored the association between the characteristics of a ward and its evaluation as a learning environment by students. The results of this pilot study were used to develop the basic research instrument. This was tested in the wide Finnish sample (Paper II). A concurrent validity instrument has been used and is reported in a separate article (Paper III). The total design of the study can be seen in Figure 1.

FOCUS OF THE STUDY: SAMPLES AND INSTRUMENTS: MAIN RESULT:



The international extension of this study was necessary for two reasons. (1) Part of the instrument development process, involved testing the new instrument in different nursing culture, because the cultural differences noted in the literature. (2) To reflect the impact of open employment markets in the European Union (EU) that has resulted in a need to evaluate and to integrate EU Health care educational systems. Paper IV describes the students' experiences and explores the differences between Finnish and British nurse education systems in clinical practice.

2 LITERATURE REVIEW

The literature review was undertaken using electronic databases with time limit boundaries of literature produced between 1980's and May of 2002. An initial review was undertaken during the pilot phase and the literature review has subsequently been updated twice: (1) In 1997 as part of the instrument validation phase and (2) as part of producing this report in 2002. The initial review utilised Cinahl and Medline databases and in the last updating phase, Ovid was also used.

In the initial review, searching terms were drawn from Marriott's (1991) early literature review and from a range of related studies undertaken in this area in the UK during the 1980's (Fretwell 1980; 1983; Ogier 1981; Orton 1983). The main search terms used were: *clinical teaching; learning environment; nursing care; culture; ward climate; nursing management; mentor (and preceptor); staff nurse; professional role; professional development and supervision*. The results of searches undertaken have been used in the concept definitions and in the development of the theoretical structure for the study.

2.1 Definition of clinical learning environment and supervision

Whilst the context of this study is unique in the western world; all modern nurse-training programmes include theoretical and practical studies. However, there is a lack of congruency in the concept definitions used to describe these shared approaches to nurse education. Language is not the sole reason for this conceptual incongruence, although some terms can have completely polarised meanings in two different English language speaking countries (e.g. concepts *mentor* and *preceptor* in the UK and in North America). Similar conceptual problems can be illustrated in the terms that refer to nurse teacher who is teaching in clinical practice. All ten terms (below) have been gathered from the literature review.

<i>clinical facilitator</i>	<i>clinical teacher</i>	<i>clinical educator</i>
<i>clinical instructor</i>	<i>link teacher</i>	<i>link tutor</i>
<i>nurse teacher</i>	<i>practice educator</i>	<i>practitioner-teacher</i>
<i>tutor</i>		

To aid clarity, this chapter will first define the main concept usage.

Clinical learning environment refers to a group of stable characteristics unique to a particular clinical setting and impacting on the behaviour of individuals within that setting (Orton 1981). These settings encompass a wide range of health care services and in the wider meaning of the term; includes all psychological, social and cultural factors of the clinical placement (Hodgson & Reynolds 1994; ENB 2001a). In this study the concept clinical learning environment refers to the clinical ward in hospital settings because the empirical data collection of the study was undertaken in the hospital environment only.

Supervision is widely used and common concept. The dictionary definitions (Oxford dictionary 1976; Webster 1993; Bloomsbury 1994) of supervision refer to the direct control of worker: *"to watch over and direct (work, workers etc.) oversee"* (Webster 1993, 663). In this study supervision as a main conceptual term covers the pedagogical activities in the relationships between student nurse and clinical staff. These kinds of activities can be e.g. assessing, mentoring, teaching etc., either at an individual or term level. In team supervision the same supervisor can have several students or the supervisor can vary according to the demands of shift rotes or type and place of work.

The term *kliininen ohjaus* (Finnish for clinical supervision) has been used when referring to the teaching of student nurses in clinical practice by nurse teachers or nursing staff. In the UK, the term clinical supervision refers to activities to advance the clinical practices, knowledge and skills of nursing team:

"Clinical supervision is a process based on a clinically-focused professional relationship between the practitioner engaged in clinical practice and a clinical supervisor. It complements, but does not take the place of formal programmes of education at pre and post-registration level. This relationship involves the clinical supervisor applying clinical knowledge and experience to assist colleagues to develop their practice, knowledge and values. This relationship will, therefore, enable practitioners to establish, maintain and improve clinical standards and promote innovation in clinical practice." (UKCC 1995,2)

In individualised supervision, the role of supervisor can also involve the supervisor taking on the characteristics of a mentor. The term mentor is used to denote the role of personal supervisor who facilitates learning and supervises and assess. Mentors have an understanding of the context of the student's learning experience and they are often

self-selected by student for the purpose of providing guidance and support. (ENB 1994; ENB 2001b.)

The preceptor should be seen as a supporter for the newly registered practitioner (nursing). The preceptor acts as a valuable source of help, both professionally and personally during the early professional career. (UKCC 1993.) In Canada and in the USA the terms mentor and preceptor have been used in a polarised manner (see e.g. Myrick 1988; Vance & Olson 1992; Dibert & Goldenberg 1995).

The terms *clinical teacher* (USA) or *practice educator* (UK) have been used to denote the role of the teacher of nursing who makes a significant contribution to education in the practice setting, co-ordinating students' assessments, experiences and the progress of learning (Wong & Wong 1987; Leino-Kilpi et al. 1995; ENB 2001b). In this study the term nurse teacher is used to illustrate a teacher who is responsible both for theoretical and clinical teaching. She or he leads the development of clinical practice and provides support and guidance to mentors and other's who contribute to the student's overall experience in practice, enabling students to meet learning outcomes and develop appropriate competencies. (Leino-Kilpi 1992, ENB 2001b.)

The conceptual terms used to illustrate the leader of a nursing team on a clinical ward are varied in the international literature. In this study the term's *sister* (used in the UK on 1980's), *nurse (unit) manager* and *ward manager* are used synonymously. In the questionnaires the preferred term used was ward manager (WM) to reflect the use of this term in other studies. (see Ogier & Barnett 1986; Yuen 1991; Dunn & Barnett 1995.)

2.2 Earlier studies of clinical learning environment and supervision

The literature on learning environments and supervision reviewed revealed differences in foci through time periods. During the 1980's the focus of much of the research was on ward culture, yet by the 1990's this focus had shifted to supervisory relationships. Various approaches to how clinical teaching and supervision have been researched are evident in studies undertaken in different countries as well. However,

despite these differences, the time and content changes noted above are partly concurrent albeit these reflect some cultural differences also (Marriot 1991; Chan 2001). Early research in the UK focused more on the clinical learning environment during the early 1980's whereas later studies at the end of 1980's focuses on the meaning of the supervisory relationship.

During the late 1990's and early 2000's the research has focused increasingly on the supervisory relationship (Saarikoski 1998; Andrews & Wallis 1999; Saarikoski & Leino-Kilpi 2002) with only a few studies focused on ward culture (Wakefield 2000; Koskinen & Silen-Lipponen 2001). However, during the 1990's, an important new topic emerged: what was the relationship between the student's experience and the level of nursing care on the ward (Smith 1987; 1991). This question is getting more important in the studies of 2000's (Turunen 1997; 2002; Lofmark et al. 1999; Shin 2000).

However research involving clinical learning environment and supervision has mainly focused on the students' experiences. Only few studies have been published about the learning needs or learning experiences of nursing staff in clinical practice (e.g. Gibson 1998; Björk 2001; Teasdale et al. 2001). For the purpose of this study, all these studies were outlined from the analyses of the empirical studies.

2.2.1 Nursing care as a basic element for students experience in clinical practice

The content of nursing care is an important issue in clinical teaching as it provides the context within which clinical learning occurs. The quality of patient care is also a crucial factor in achieving meaningful learning experiences. (Leino-Kilpi 1990; 1991; Quinn 1995.) High-quality nursing care has been defined as care that is holistic and individual, provided by a nursing team with a defined nursing philosophy (Leino-Kilpi 1990; Kalkas 1991).

Clinical learning and nursing care should always be considered together because they are both comprehensive and interrelated. For example, the student nurse who sees the

whole individual nursing process has a much clearer picture than one who has only participated in series of disconnected tasks (Davis 1990; Smith 1987; 1991). Contact with patients is an important element in learning nursing in clinical practice. Students are exposed to authentic life stories - for example people with serious illness and these experiences can arouse strong emotions and yet they also offer meaningful learning experiences. These kind of clinical situations are important impulses and challenges to professional development. (Turunen 1997; Loftus 1998.)

However, linked to this is the caveat of the impact of workload on the ward. It can be argued that a heavy physical workload and the pace of work will result in a decrease in the levels of work satisfaction of nursing staff. However in many research studies the evidence is contradictory, for example, nurses working in the intensive care units suffer lower occupational stress, than nurses working on conventional medical and surgical wards do. Although long stay wards have been reported as being more stressful working environments than the wards, which are hectic and where the patient stay is short. (Thomas 1992; Levec & Jones 1996; Adams & Bond 1997.)

Studies, evaluating the learning environments from the viewpoint of ward type are few low in number. From these limited studies, generally students have commonly experienced the worse learning environments as being those lesser technically orientated departments, in which the patients' stay is long. In the main, these were surgical wards, noted as being often 'good' and both medical and geriatric wards as 'poor' learning environments by students. (Fretwell 1980; Parkes 1980; Lewin & Leach 1982.)

However, later studies have demonstrated that understanding what a 'poor' learning environment means is more complex. Smith (1987) noted similarities between the relationships of students and qualified staff and the relationship between patients and qualified staff. The results of Beck (1993a), Kosowski (1995) and Nehls et al. (1997) have confirmed this perception. Thus, it is possible to argue that where nursing practice effectively reflects a shared sense of caring in the relationships between staff and patients and staff and students, such relationships result in mutual respect and a greater sense of trust (Stark et al. 2000).

2.2.2 Ward culture and clinical learning environment

One of the most important features of good clinical learning environment is psychological security. This is achieved in an environment, in which the atmosphere is fair and where students can solve learning problems and also in a culture that tolerates faults and mistakes as part of the learning process. Thus in such an ideal learning environment, students are placed optimally and their workload is also optimal. Inactivity and minimal patient contacts are associated with poor learning experiences. In secure working environments the student can also impact on the development of the professional nurse role; the student nurse can move flexibility between roles of learner and newly practitioner. (Orton 1983; Neville and French 1991; Wilson-Barnett et al. 1995; Dunn & Hansford 1997.)

The majority of research undertaken during the 1980's emphasised the ward manager's role and type of ward culture (Fretwell 1980; Ogier 1981; Sellek 1982; Orton 1983). Clear differences in perceptions of how important ward teams saw their teaching tasks have been noted. Orton (1983) defined the quality of the teaching atmosphere being: high student orientated wards (HSO) and low student orientated wards (LSO). On the HSO ward, there is a non-hierarchical structure with good communication relationships evident. From Orton's work (1983) the main influence factor was the ward managers' role as a teacher and supervisor of student nurses. The typical LSO ward presents to the student nurse an experience characterised by the student being seen as a worker rather than a learner. Here the ward manager attaches very low priority to the students learning. (Fretwell 1983; Orton 1983; Chun-Heung & French 1997.)

Over time, many of these studies noted that the focus of research shifted from ward managers teaching and supervising activities to the issue of how a ward manager creates presuppositions for the process of students' supervision (Ogier & Barnett 1986; Vaughan 1988; Allisop & Orton 1992). The positive ward culture depends on the leadership style of the ward manager. If there is prevailing positive team spirit on the ward, this will be reflected in all the basic functions of the ward: nursing care, co-operation of staff, supervision of students etc. (Sinkkonen et al. 1986; Hyland et al.

1988.) This argument has been supported by later studies (Yuen 1991; Wilson Barnett et al. 1995; Troskie et al. 1998).

2.2.3 Pedagogical activities of nursing staff and the supervisory relationship

The pedagogical activities of nursing staff have been mainly studied in the context of the individualised supervision relationship. Much of this research has been undertaken in the USA or in Canada on the late 1980's and early 1990's. Human relations and atmosphere on the ward as an important variable were undertaken in the UK. The research involving pedagogical activities of nursing staff is relatively recent. (Marriott 1991; Saarikoski 1998; Suen & Chow 2001.)

The individualised supervisory relationship has largely been studied from the perspective of professional socialisation. The key question has been: *how to support a new nurse in that transition when he or she is leaving studying phase and starting working life?* As noted above, a mentor or preceptor relationship is a crucial factor in this transition process. That's why the individualised supervisory relationship is an important issue, especially in the latter phase of studies. (Clayton et al. 1989; Scheetz 1989; Campbell et al. 1994.) There is considerable evidence that a *one-to-one* relationship is one of the most important contributors to students learning in clinical practice (Hsieh & Knowles 1990; Goldenberg & Iwasiw 1993; Crawford et al. 2000). Empirical studies undertaken in Finland strongly support this point of view (Hautala 1994; Laakkonen 1994; Arvonen 1997; Munnukka 1997; Turunen 2002).

Confidential supervision sessions are considered important, because they enable talking about student's own experiences and feelings (Hsieh & Knowles 1990; Lashinger & Mac Master 1993; Shatkin 1995; Crawford et al. 2000). Often the traditional model for supervision was team supervision, whereas current models emphasise individualised supervision. As practices of clinical teaching have changed, the role of the staff nurse has become more important in the clinical supervision process than before. For example, Clifford's (1993) study noted that nurse teachers assessed the staff nurses have more involvement in teaching activities, than the nurse teachers themselves did.

However, the role of the staff nurse in the supervision of student nurses has only received a limited evaluation. Ferguson and Jinks (1994) note in their literature review, that there are many problems in the supervisory role of nursing staff. Clinical staff often experience conflicting pressures in their dual role as teachers and carers. Much of the qualified staff time is often spent on administrative work and basic work is delegated to the staff with less experience. (Ogier 1981; Reynolds 1990; Crotty & Butterworth 1992; Atkin & Williams 1995.) Also in a number of Finnish studies, similar problems have been found. There is clear gap between the goals of curriculum and clinical practice: staff nurses are not aware of the curriculum content and they emphasise different elements of clinical studying than those used by nurse teachers. Sometimes the collaboration between teaching and nursing staff is ineffective. (Hentinen 1989; Heikkinen 1994; Lohva 1998; Oinonen 2000.)

The staff nurse is likely to be an influential person in supervision of student nurses. Melander and Roberts (1994) report on a five-year' project, in which the student, nurse teacher and qualified staff nurse formed a *clinical triad* where the student had a permanent *one-to-one* relationship with an experienced staff nurse. They worked together and met the nurse teacher regularly. Both the nurse teacher and staff nurse have their own roles: the staff nurse is the expert in clinical practice, whilst the nurse teacher can give a more theoretical perspective to the clinical situations. He or she can help the student to find the underpinning theoretical evidence for the clinical practices of the unit. The nurse teacher is an expert in educational processes as well.

Traditional clinical teaching practices are being challenged and clinical teaching is in the state of transition. For example, it is argued that traditional practices are inclined to expand the *theory practice gap*. (Packer 1994; Paterson 1997.) New models and approaches are currently being evaluated (Shah & Pennypacker 1992; Cawley-Baird et al. 1994; Melander & Roberts 1994; Syrjälä & Talsi 1998). Common features in each of these projects have been the development of new models of co-operation between nurse teachers and clinical staff.

2.3 Theoretical framework of the study

The theoretical framework of this study draws upon a number of empirical studies into the clinical learning environment and supervision undertaken in the 1980's and 1990's. The initial literature review utilised Cinahl, Medline and indexes of all Finnish universities. These searches identified 67 empirical studies (Appendix 1) and five theoretical articles each of which contained different clinical learning environment audit instruments (Shailer 1990; Reed & Price 1991; English National Board 1993; Farrell & Coombes 1994; Orton et al. 1994).

The main topics of the empirical studies were categorised. The empirical studies and theoretical articles were used in the development of the theoretical structure for this study. The categorisation of research topics was to some degree artificial because the theoretical structures of the studies were quite disconnected. However, it was relatively easy to allocate all of the studies into at least one of the categories. Some studies were so multi-dimensional that they might have been allocated to more than one category, however, they have been allocated only to one 'best-fit' category. Initially there were five main categories but there was considerable overlapping of categories. The original five categories were therefore reduced to three main categories: (1) Nursing care; (2) Ward culture; (3) Pedagogical activities of nursing staff. These three categories provide a basis for the for analysis of the content of the audit instruments.

In the pilot study (Saarikoski 1995), there were seven main themes in the questionnaire, which were made up of 50 statements. All items were derived from the results of empirical studies. The results of the pilot study were reviewed in order to develop a more robust research instrument. The sample (N=162) of the pilot study was too small for any complex statistical investigations (e.g. factor analyses) but some explorative cluster analyses were undertaken for evaluation of the content sub-dimensions. The outcomes from the literature review, the results of pilot study and analyses of audit instruments decreased the final number of sub-dimensions of CLES to five (Saarikoski 1998). (The instrument development process is described in more detail in the chapter Empirical aspects of the study.)

Although the audit instruments were developed in a way that reflected more expert opinions and assessments than empirical studies, they were important tools in the building of theoretical structure. The origins of the concept of audit are to be found in financial administration. For example, (Bloomsbury 1994, 61) notes audit as being "*an examination of accounts or dealings with money or property by person, especially accountants, appointed for that purpose; an examination into one's actions*".

Through the total quality management (TQM) revolution, the concept has been expanded to mean, an evaluation tool developed through the assessments of experts (Little 2001). In the terminology of this study auditing is used to reflect an examination and exploration of available learning opportunities in clinical practice (Reed & Price 1991).

Five audit instruments were content analysed. Headings and subheadings were gathered for the list (*coding*). After this the same content observations (in the list) were formed into groups (*pattern*). Combining patterns formed eight main themes, where all subheadings or any subassembly could be located (*pattern coding*). Every theme class was allocated a descriptive name. (Miles & Huberman 1994.) (Table 1)

Table 1 Themes in five audit instruments (Shailer 1990; Reed & Price 1991; English National Board 1993; Farrell & Combes 1994; Orton et al. 1994) in the order of frequency

Themes involving the quality of learning environment and supervision:	Audit instruments:					
	Shailer	Reed & Price:	ENB:	Farrell & Combes:	Orton et al.	
Total:						
<i>'Teaching, supervision'</i>	+	+	+	+	+	5
<i>'Issues involving resources'</i>	+	+	+	+	+	5
<i>'Nursing care, quality of nursing care'</i>	+	+	+	+	-	4
<i>'Nursing management, quality management'</i>	+	+	+	+	-	4
<i>'Assessing as a part of supervision'</i>	+	-	+	+	+	4
<i>'Ward culture, ward atmosphere'</i>	+	+	+	-	-	3
<i>'Ward as a pedagogical environment'</i>	-	-	+	+	+	3
<i>'Individualized supervision'</i>	-	-	+	-	+	2
Number of themes by the instruments:	6	5	8	6	5	

The English National Board (1993) audit instrument only includes all demonstrated themes. In the context of this study it an important observation that theme *individualised supervision* is mentioned only in two audit instruments (ENB 1993; Orton et al. 1994). The reason for this might be the source of the audit instruments; they were all developed in the UK, where the *mentor* -research did not start before the late 1990's. In the earlier studies (and in the audit instruments) there were many of the same elements, concepts and research focuses used. It was from these that the structure of the research instrument was developed. These elements, themes and concepts are illustrated in the Figure 2 showing how the sub-dimensions of CLES were developed.

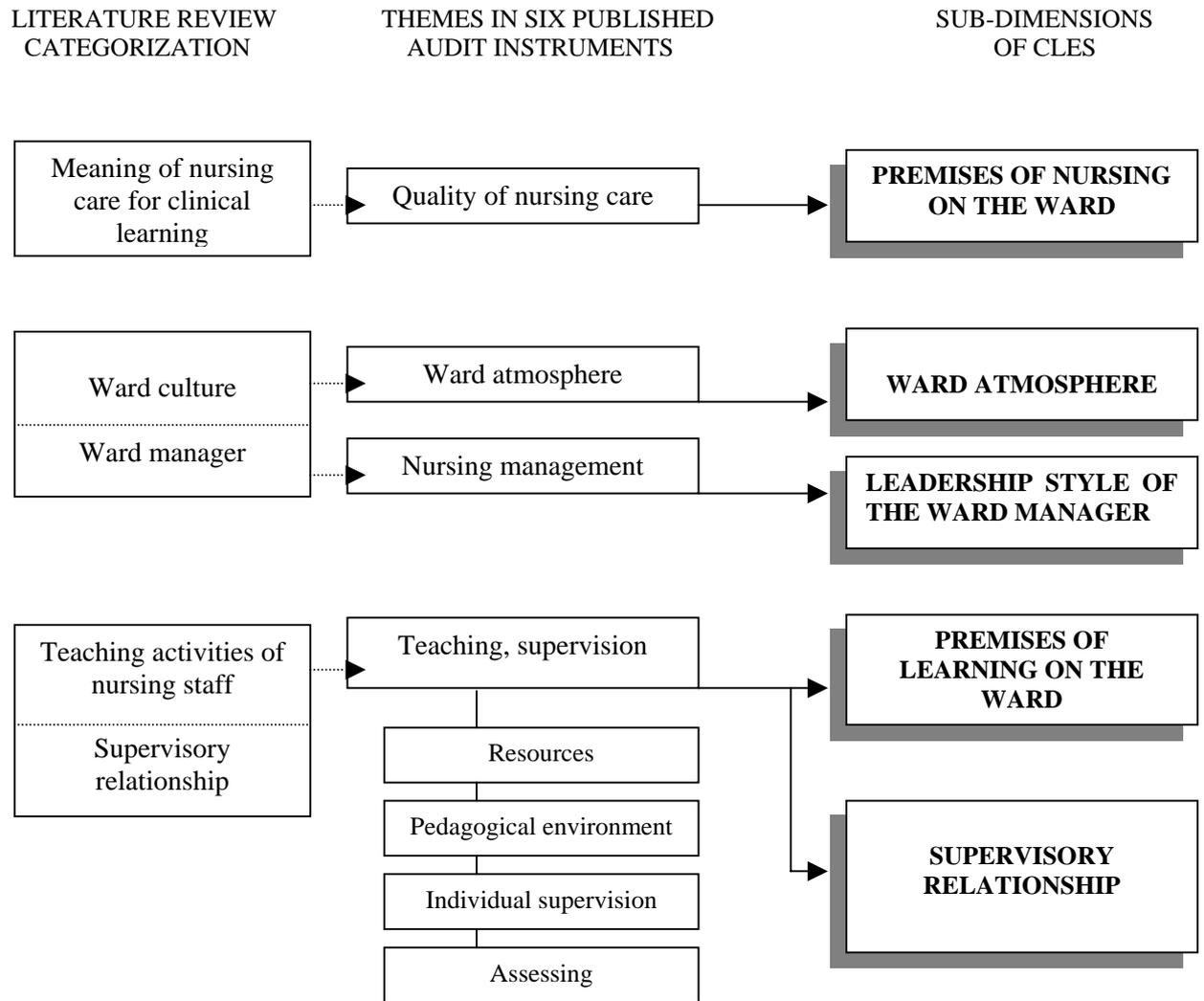


Figure 2 Theoretical framework of the study and the sub-dimensions of the CLES

After the theoretical construction of the CLES was achieved, a further clinical learning environment instrument was published (Chan 2001) and one further mentorship evaluation scheme (Suen & Chow 2001). Chan's (2001) Clinical Learning Environment Inventory (CLEI) is based more on an in-depth literature review of classroom learning environments. It has been modified from the *College and University Classroom Environment Inventory* (CUCEI) and complemented with perspectives of clinical studying in hospital settings. CLEI (2001) consists 35-items and subdivided into five sub-scales: Individualisation; Innovation; Involvement; Personalisation; and Task orientation. Chan's (2001) development of CLEI also used a qualitative approach as part of the validation process of the instrument. The results

from the analyses of the interviews were congruent with results of the quantitative analyses. CLEI has been tested in Australia.

Suen's and Chow's (2001) mentorship evaluation scheme is based on a similar theoretical background to CLES but focuses only mentor-mentee -relationship. It considers mentorship from both pedagogical and psychological perspectives. The scheme uses a 4-step scale and consists of 33 items, sub-divided to five categories. This instrument has been tested in Hong Kong.

3 AIMS OF THE STUDY

The purpose of this study is:

1. to describe how nursing students' experienced their clinical learning environment and the supervision given by staff nurses working in hospital settings
2. to develop and test an evaluation scale of Clinical Learning Environment and Supervision (CLES).

More specifically, the following research questions were addressed:

- How do the characteristics of the ward contribute to its role as a learning environment? (Paper I)
- How does the supervision of student nurses occur in the clinical placements? (Paper II)
- What kind of theoretical structure can be modelled to represent clinical learning environments and supervision by staff nurses? (Paper II)
- What is the level of congruence of CLES with a concurrent validity instrument (CLE scale)? (Paper III)
- How the developed instrument (CLES) works in two different nursing cultural contexts (Finland and United Kingdom)? (Paper IV)

4 EMPIRICAL ASPECTS OF THE STUDY

4.1 Instrument development process

The noticeable feature of a 'good' quantitative research is *rigor*. It is '*the striving for excellence in research and involves discipline, scrupulous adherence to detail, and strict accuracy*' (Burns & Grove 1997, 41). This description illustrates the instrument development process because it strives for more precise measurement methods, representative samples and the continuous improving of the research instrument. Instrument developing processes includes specific phases that consist of meticulous details, which are logically linked together. These phases are critically examined and re-examined for errors and weaknesses in such areas as design, measurement, sampling and statistical analysis. (Wilson 1989; Burns & Grove 1997.)

The first version of research instrument was developed for the pilot study of this research project (Saarikoski 1995; Saarikoski & Leino-Kilpi 1999). The pilot version was derived from an extensive review of empirical studies and published audit instruments. From the results of pilot study it was possible to see that the theoretical structure of the instrument required further modification. For example, some sub-dimensions were incoherent: it was possible to conclude from the low Cronbach's alpha values. Also the number of statements was too high for an 'ease-of-use' evaluation scale. There is some evidence in psychometric measurement that a short instrument can be remarkably robust tool whilst being still valid. It can work as well as longer versions (Cheung & Spears 1994; Goldberg et al. 1997).

After the revisions (resulting from the pilot study), the CLES was used in two different samples (Saarikoski & Leino-Kilpi 2002; Saarikoski et al. 2002). The actions, which were used in this confirmation of validity and reliability, were (1) the evaluations of results of pilot study; (2) the use of an expert panel; (3) test-retest with a small sample and (4) selection of criterion related instrument. These actions will be presented in this chapter.

4.1.1 Confirmation of validity

Validity refers to the ability of a research instrument to measure accurately what it is supposed to measure. When an instrument is valid, it truly reflects the concept it is supposed to measure and it can produce trustworthy research results. The main types of validity are content validity, criterion-related validity and construct validity. (Wilson 1989; LoBiondo-Wood & Haber 1994.) Validity is a crucial element of instrument development and for this reason it has been carefully considered during the initial piloting and refining phases.

Content validity is the most important type of validity because it ensures the match between research target and the data-collecting tool of the study. It is important to delineate the exact nature of the construct and specify all dimensions of research target. (Wilson 1989; Burns & Groove 1997.) Content validity is the determination of the content representatives or content relevance of the elements of an instrument (Lynn 1986). The extensive literature review in the field of clinical learning environment and supervision led to the content analyses of earlier studies and five audit instruments (Shailer 1990; Reed & Price 1991; English National Board 1993; Farrell & Coombes 1994; Orton et al. 1994). The congruence of these two validity sources was relatively high. These analyses led to the basic theoretical structure of the study (presented in Figure 2).

Face validity is one part of content validity. It promotes validity through the assumption of a logical tie between various items and the research area. The practical tool in the assessment of face validity is an expert panel. Often, the members of panel are experts in the content area of the proposed study. Normally, the number of experts can be moderately low because the assessments are based upon non-statistical methods. (Lynn 1986; Zhan & Shen 1994; Paunonen & Vehviläinen-Julkunen 1997.)

Nine experienced nurse teachers who had ongoing relationships with clinical teaching formed the expert panel for CLES. They were asked to evaluate 32 items, which were revised after the pilot study. The scale (Lynn 1986, 384) was: (1) *not relevant*; (2) *unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant*; (3) *relevant but needs minor alteration*; (4) *very*

relevant succinct. Lynn (1986) notes that the level of consensus must be high - about 80-90%.

The panels accepted fully 18 items and to a further 11 items proposed small contextual or linguistic revisions. Two further items received some negative responses proposed significant revision of these two items. There was a conflict between the theoretical content validity and face validity: two experts were unconvinced of the significance of the ward manager's role in the CLES. However, the concept of the ward manager is so important in this research area by literature review that all items involving the ward manager were retained. The results of expert panel was that 29 items were evaluated as relevant and included in the test-retest version of CLES.

Concurrent validity of a developed instrument can be evaluated using another research instrument simultaneously to collect the same research data. In practice, it means that informants of a study answer items from two different instruments. Concurrent validity is one type of criterion-related validity. (A second type of criterion-related validity is predictive validity; a current measure used to predict future performance. For example, scores on professional socialisation test are used to predict future satisfaction on the job.) (Wilson 1989; Teasdale et al. 2001.) Often the problem in testing concurrent validity is that there is not an adequate and valid instrument available. A common situation is that the researcher must select an instrument, which measures the research target from a slightly different perspective (Wilson 1989).

A concurrent validity instrument to CLES was used: the Clinical Learning Environment scale (CLE scale) developed by Dunn and Burnet (1995). The CLE scale is based on a 55-items questionnaire of Orton's (1981) ward climate survey. Using an expert panel, the Orton survey items were chosen and revised for an 23-items CLE scale (Dunn & Burnett 1995) which has been used as the concurrent instrument in the validation of CLES. There are five sub-dimensions in the CLE scale: (1) Staff-student relationship; (2) Nurse Manager commitment (a synonym of the term Ward Manager); (3) Patient relationship; (4) Interpersonal relationships (Hierarchy and ritual on 1997 version); and (5) Student satisfaction (Dunn & Burnett 1995; Dunn & Hansford 1997).

(Construct validity of CLES will be presented in the chapter of Results.)

4.1.2 Confirmation of reliability

The evaluation of an instrument reliability can involve three different types of reliability. (1) Internal consistency reliability, which can be analysed by using Cronbach's alpha coefficient. It reveals how homogeneously items makeup one sub-dimension (Alkula et al. 1994; Zhan & Shen 1994). (2) Test-retest reliability can be estimated in the measurement of the stability of an instrument over time. A small representative sample of target population complete the same questionnaire twice - over a specific interval of time - and the correlation between the two scores is analysed. (Caulcott 1992; Burns & Grove 1997.) (3) Values of items in factor analyses can also be considered as reliability values: the higher values there are the higher the level of reliability (Nummenmaa et al. 1997).

The estimation of reliability is a constant requirement of empirical data collection. The reliability of CLES has been estimated three times: (1), in the sample involved in the pilot study; (2) in the test-retest and (3), using research data, which had been collected after the confirmation of validity and reliability. In this chapter two reliability types will be presented and the reliability values in the light of results of factor analysis are presented in the Results chapter.

Internal consistency reliability of the CLES improved after the initial piloting and refining process. In the pilot study, the internal consistency reliability coefficient of sub-dimensions ranged from high (0.95) to marginal (0.51) using Cronbach's alpha (Saarikoski 1995). There were three sub-dimension with Alpha values on acceptable level: 'Supervisory relationship' (0.95); 'Ward atmosphere' (0.84) and 'Premises of learning on the ward' (0.78) (Alkula et al. 1994). After revising (decreasing the number of items, correcting language and improving the form) the internal consistency reliability of CLES were analysed in the main sample (n=416) of this study. This part of internal consistency reliability is presented in the Results chapter.

Test-retest reliability was evaluated after the revisions made by the expert panel. The number of items included in the test-retest was 29. The test-retest group (n=38) was formed from two student groups, who had just ended their clinical placement and were asked to evaluate the learning environment and supervision of their last clinical

ward placement. The questionnaires were identified with order numbers from 1 to 38. The students were asked to note the identification number of the questionnaire in their personal diaries. This enabled analysis of the data so that every assessment could be compared with the correct assessment. After four weeks the students were asked to use the same identification number and to evaluate exactly the same clinical placement they had evaluated four weeks previously.

The test-retest resulted in two items having low reliability values. The correlation of singulars accepted items ranged from 0.52 to 0.89 ($p < 0.001$) and coefficients of sub-dimensions ranged from 0.71 to 0.91. The higher amplitude of sub-dimension is explained by the high internal consistency of items inside of each sub-dimension. The total instrument test-retest reliability was 0.81.

In a measurement of attitudes the opinions tend to transform systematically in the direction of more critical assessments (Eskola 1975; Alkula et al. 1994). The comparison between two different measurements (1st and 2nd measurement of test-retest) was made. The direction of small coincidental transformations was not systematic. For example, the transformations in the statement '*Basic familiarisation was well organised*' was nine times more critical, eight times more positive and the majority of students (21) assessed the current statement with same grade in the later measurement. Statistical analysis was made on the level of sub-dimensions using a mean test of repeated measurements. The test used in the analysis was Wilcoxon test, which is a non-parametric analogue of T-test (Caulcott 1992; Tähtinen & Kaljonen 1996). There were no statistically significant differences between the measurement times.

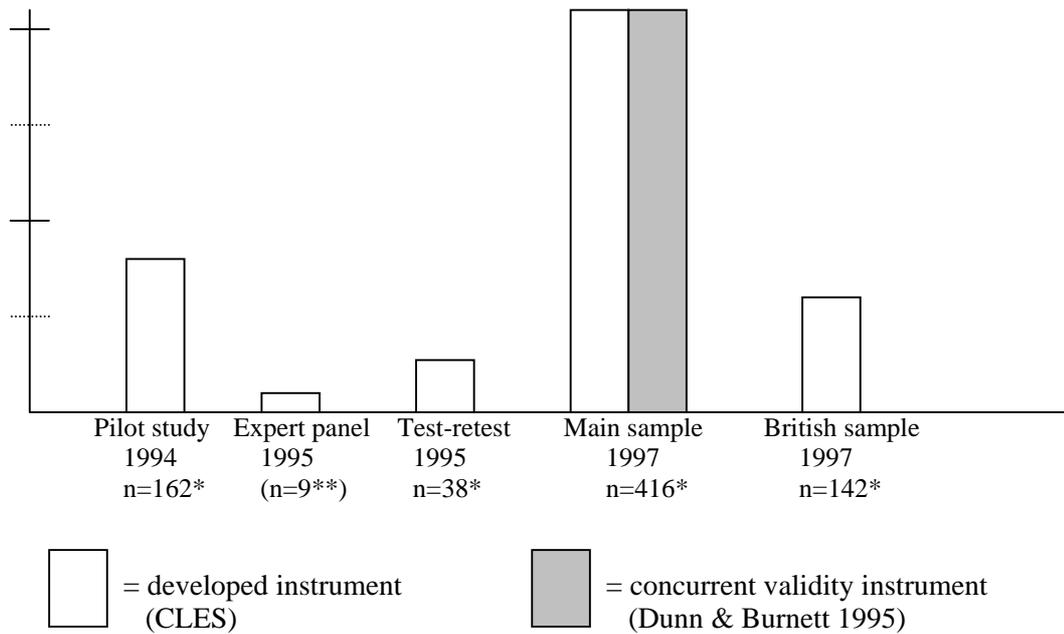
4.2 Samples and contexts of clinical placements

The data collection phase of this study was carried out during 1994-1997 and consisted of four different samples. The data from the pilot study ($n=162$) was collected in 1994 and the data ($n=38$) for test-retest was collected in 1995. These two samples were collected from one large nursing college in Southern Finland.

The main sample (n=416) of the study was made up from four colleges of nursing located in Finland in 1997. Two of the colleges were chosen from the larger colleges of nursing (350-400 nurse students). These two colleges were located near university hospitals used for clinical placements. Two smaller colleges (100-150 nurse students) were used, they co-operate with medium-size regional hospitals clinical practice placements. The chosen colleges were typical Finnish nursing colleges in relation to the size and functional environment (hospital types) used by college (Järvinen 1993; Koulutusopas 1995). The respondents from the main data collection phase had had their clinical placement in eight different clinical specialities. The ward types used, were, in the order of frequency: medical, surgical, psychiatric, paediatric, geriatric, gynaecology, oncology and obstetric wards.

The sample (n=142) for testing the CLES in the international comparative study was collected from two universities in Southern England during 1997. The universities chosen, were typical British nursing colleges in relation the size of the nursing college and the traditions of nurse education. Both universities were selected as co-opted partners in this study as both universities had pre-existing international contacts, were research orientated and there was a positive attitude to developmental evaluation projects. These factors helped to ensure the validity and stability for arrangements of data collection.

At the time of data collection, both in Finland and in the UK, the nurse training programmes begin with theoretical studies and with clinical practice being introduced during the students second year. In both countries, the main population of samples was made up of nursing students in the middle phase of their training programme. The total sample of this study is presented in Figure 3.



* = Student nurses

** = Nurse teachers

Figure 3 The samples of the study

All samples were collected in hospital settings, mainly in those in the public health care system. Only a very small part (6% of Finnish sample and 8% of British sample) of the overall groups of students had practised in social or private sector organisations (Table 2).

Table 2 The ward types of the clinical placement by the samples

Ward type sample:	Pilot study:		Main sample:		British	
	%	f	%	f	%	f
Medical wards	30	49	28	115	21	30
Surgical wards	19	31	20	84	20	28
Paediatric wards	19	31	14	58	2	3
Psychiatric wards	27	43	19	80	20	28
Geriatric wards	2	3	8	33	22	33
Gynaecology wards	-	-	2	9	7	9
Oncology wards	3	5	2	8	-	-
Obstetric wards	-	-	1	6	-	-
Other (e.g. social sector units)	-	-	6	23	8	11
	100%	162	100%	416	100%	142

Community nursing and outpatient clinic placements were excluded in order to achieve as homogenous a sample as possible. These types of services employ a different focus to the nursing care provided. The second reason for exclusion was the instrument development process: the occasional and notable differences in the samples (caused by the practical contexts of samples) confuse the validation process (Alkula 1994 et al.; Caulcott 1994; Nummenmaa et al. 1997). The clinical specialities where students undertook their clinical placements varied by in both countries (Table 2).

4.3 Ethical issues

All ethical standards of research were observed: anonymity, voluntariness and rights to refuse to participate were guaranteed to respondents (Burns & Grove 1997; Nieswiadomy 1998). Written permission to carry out the study was obtained from the Principals of the nursing colleges and the universities. The Principals were informed that comparisons between colleges or universities would not be undertaken. The research report was promised to be delivered to the libraries of the colleges and universities after the study.

During the data collection phase, the respondents' right to privacy was protected: the design of the study did not demand the use of identifiable questionnaires. In the test-retest, identified questionnaires were used but only through a personal identification code without name. All respondents were informed about the aims of the study and assured that all the information obtained would be handled anonymously and that only the researcher would have access to the raw data.

Data was collected at the end of a clinical placement using an anonymous questionnaire. All respondents volunteered to take part in the study and they gave their consent verbally. The respondents were informed also that they could become acquainted with research results through the libraries of their institutions at the completion of the study.

4.4 Instrument versions, questionnaires and statistical methods

There were a number of linguistic problems involved in undertaking this study: In Finland, the primary language is Finnish and the concurrent validity instrument (CLE scale) was not available in Finnish and in Finland developed CLES would be used also within the English language population. The CLE scale was translated using specific three steps procedure to provide semantic equivalence (White & Elander 1992) (see Paper III). Also the CLES was translated using the author of this study and bilingual (native English speaking) language teacher. The final verification and adjustment of concepts used in the CLES was made by a native English speaking nurse teacher who worked in the UK.

Four different versions of CLES were used during the research process. (1) In the questionnaire for the pilot study, there were 50 items subdivided into seven areas. (2) In the test-retest a 29-item version subdivided into five areas without background variables was used. (3) After the linguistic and statistical procedures were addressed the main data from Finland were collected with a revised Finnish language version with 10 background variables and 27 CLES items (Appendix 2). This questionnaire also included the concurrent validity instrument (23-item CLE scale in Finnish). The layout of the questionnaire was designed so that it would be impossible for respondents to identify which of the instruments the items came from. The questionnaire was four pages long. (4) The data from the UK was collected with an identical English language version of the 27 items CLES (Appendix 3).

The underpinning approach to the linguistic formation of the CLES's items was that it should be capable of illustrating an optimal learning environment and supervisory relationship. The reason for this was an attempt to achieve as much clarity as possible. This ensures that when a respondent has read the options available on the of continuum scale (used in the statements) once, they should be able to complete the whole questionnaire without reading the direction again. In addition, the absence of negative statements diminishes the risk of coding faults in the data-handling. The alternatives of the five-step continuum scale (used in all phases of the study) were: (1) *fully disagree*; (2) *disagree to some extent*; (3) *neither agree nor disagree*; (4) *agree to some extent* and (5) *fully agree*.

The first phase in the statistical analysis involved measures of central tendency. These are the most concise statement of the location of the data because they enable the assessments of distribution forms. The shape of a curve is discussed in terms of symmetry, skewedness and kurtosis. Skewedness reveals the symmetry of the curve. A curve may be positively skewed, which means that the largest portion of the data is below the mean whereas negatively skewed means that the largest portion of data is above the mean. Another term used to describe the shape of the distribution curve is kurtosis. It explains the degree of peakedness in the curve, which is related to the spread of score variance. (Alkula et al. 1994; Burns & Grove 1997.) The estimate of these values is imperative because they show the forms of distributions, which enable the use mean tests. Only the small sample of test-retest (n=38) was analysed using non-parametric test (within the comparison of measurement times). The reason for this was the size of sample (Caulcott 1992). Generally, the values of skewedness and kurtosis revealed were sufficient to enable the mean tests to be used as analysing tools. The more advanced statistical analysis used in this study was variance analysis, factor analysis and canonical correlation. Table 3 summarises the designs and analysis used in the different parts of the study.

Table 3 Designs, subjects and statistical analyses in the phases of the study

Phase of the study:	Design:	Sample:	Type of analyses:
Pilot study Paper I	Descriptive study	Student nurses in one nursing college (N=162)	Mean, deviation, cross-tabulation, Pearson correlation, Cronbach's alpha
Test-retest Reported in summary	Explorative study (controlling of measurement)	Two student groups (N=38)	Pearson correlation, Cronbach's alpha, Wilcox test
Testing of revised version of CLES Papers II & III	Descriptive and explorative study (concurrent validity)	Student nurses in 4 colleges (N=416)	Measures of central tendency, variance analyses, explorative factor analyses, Pearson correlation, canonical correlation, Cronbach's alpha
Testing of CLES in the international comparative study Paper IV	Descriptive and comparative study	Sample from the UK (N=142)	Mean, deviation, cross-tabulation, variance analyses,

5 RESULTS

In this chapter, the results of the study are presented in two main sections. In the first section, the students' experiences of learning environment and supervision are considered. The second section discusses the results of instrument developing process.

This chapter summarises the results, which were presented in papers I - IV in detail. The results reported the main elements of the theoretical structure of this study, ensure that all elements are considered from the viewpoint of both Finnish and British samples in the light of factor analysis. Also, specific issues (for example, workload, the structure of supervisory relationship) arising from the theoretical element are reported.

5.1 Clinical learning environment and supervision

5.1.1 *Nursing care as a basic element for student's experience*

The students evaluated the quality of nursing care as 'good' in all parts of this study. It varied from 3,14 to 3,61. British students evaluated the premises of nursing with higher scores than students from Finland. In the Finnish main sample the mean was 3,50 and in the British sample, the corresponding value was 3,61 (on 5-step continuum scale) and was the highest value of the samples of the study. In this part of study, the difference between samples was statistically low in significance ($p > 0.05$ in ANOVA).

Nursing care is an important element in the clinical practice of student nurses. This can be seen in the explorative factor analysis of both instruments. In the CLES's factor model it was the third most important factor (Eigenvalue 2,26; explanation percentage 9%). This outcome was congruent with the CLE scales model (importance level was third and its values the same level: eigenvalue 2,51; explanation percentage 7%).

In the results of pilot study the differences between ward types was very strong ($p < 0.001$ in ANOVA). A comparison was made between the experiences of students who had been in medical, paediatric, psychiatric and surgical wards. The students gave the highest assessment to the psychiatric wards, followed by surgical wards, paediatric wards and finally, medical wards (see Figure 1, Paper I). In the Finnish main sample ($n=416$) the differences between ward types (quality of nursing care assessed by students) appeared as well ($p < 0.001$). In this sample the order of the ward types was different. Highest scores achieved were the paediatric wards, followed by psychiatric wards, surgical wards and finally again, medical wards.

One possible feature of the different the ward types is the workload levels assessed by students. The ward types varied in the level of workload but the differences were not statistical significant. The wards assessed by the students as having the heaviest workload were the geriatric and medical wards (Saarikoski 1995; Saarikoski & Leino-Kilpi 1999). Across all the samples, there was no significant statistical connection between workload levels on the ward and students' satisfaction of the learning environment and supervision.

5.1.2 Ward culture and clinical learning environment

The students' experiences in clinical practice were mainly positive but the differences between the groups were notable: Finnish students were more satisfied of the clinical learning environment than students in the UK. Students' assessments (using 5-step continuum scale) varied between 3,42 and 3,78 in different samples. The British students assessed their clinical learning environment with lowest scores (For example 'Premises of learning on the ward' as 3,42). On the sub-dimension 'Ward atmosphere' the difference was statistical significant (Paper IV, Table 2).

In the light of factor analyses and correlation tests, it can be seen that 'Ward atmosphere' is an overwhelming sub-dimension, which has connections with all other sub-dimensions of the ward. Although the eigenvalue of 'Ward atmosphere' is low in the factor model, this does not imply the practical implications are minor. Its high correlation with all the other sub-dimensions can be interpreted so that it is a general

factor of clinical learning environment which is influential and spreads on all sub-dimensions (see Tables 4 & 5, Paper II; Table 2, Paper III).

Earlier studies (Fretwell 1980; Sinkkonen et al. 1986; Hyland et al. 1988; Yuen 1991) noted that positive ward culture, characterised by 'good' atmosphere and communication relationships of the ward, is dependent on the leadership style of the ward manager. This proposition was tested in the factor analysis of both instruments. The sub-dimension 'Ward manager' was similar in both models. Although these sub-dimensions of the CLES and CLE scales emphasise different dimensions of the role of the ward manager, the value associated with this factor is ranked the second most important in both the CLES's and CLE scales factor models. In the factor analysis, its eigenvalues were moderately high and the correlation with other sub-dimensions low. This is a characteristic of the variable, which predicts alone a lot of variance of variables. This would tend to support the argument that WM is a crucial contributor in creating a positive ward atmosphere amongst nursing staff.

5.1.3 Pedagogical activities of nursing staff and the supervisory relationship

The supervisory relationship is the most important single element of pedagogical activities of nursing staff. The respondents of this study evaluated their supervisory relationship as 'good' (mean values from 3,38 to 3,51) in all samples. British students evaluated their supervisory relationship with lower scores (mean 3,38) but the difference compared with the Finnish sample was not statistically significant (Table 3, Paper IV). The importance of the supervisory relationship can be seen in the result of factor analysis of CLES. The supervisory relationship is the most important factor and accounts for 40% of the variance in all variables. Its eigenvalue was 10.87.

The total satisfaction of students correlated most clearly with the method of supervision and with the number of private supervision sessions. This can be seen both in the Finnish and British samples. The most satisfied respondents were the students who had a successful mentor relationship and access to a private supervision session at least once a week. The most unsatisfied were students with a failed supervisory experience. The comparisons between the variations of the supervision

systems were made using variance analysis and differences between the groups were statistically highly significant ($p < 0.000$ in ANOVA) across all samples of this study.

The preferred approach to supervision is increasingly towards the individualised supervision. The percentile proportion of the individualised supervision model varied from 58% to 67% in the different parts of this study. There were any difference between the Finnish and British samples. (Proportion of team supervision varied from 33% to 42%.)

Whilst there is a shared intent and desire to facilitate individual supervisory sessions (and mentor relationships), there were a number of practical problems in organising this. A relatively high number of all respondents (31% in the pilot study and 21% in the Finnish main sample) reported that they experienced an unsuccessful supervision relationship. This was supported by the options chosen by: *'The personal mentor was named, but the relationship did not work at all'* or *'The named mentor changed during the placement'*. The proportion of all supervisory relationships that viewed as being a successful supervisory relationship varied from 36% (Paper I, p. 471) to 42% (Table 3, Paper II). An emergent trend can be seen in the data collected over time in relation to supervisory relationships. Data was collected over three and a half years (1994-1997). During this time the number of successful individualised relationships has increased (and the number of unsuccessful relationships has decreased).

In this study, the number of separate private supervision sessions with the students own mentor has been taken as a quality indicator of individualised supervision. In the questionnaire, this kind of supervision session is defined as *'a supervision session in which the nurse teacher was not supposed to take part'*. There were no significant differences between the Finnish and British samples over how students worked with their mentors. The percentile proportion of students who had private supervision sessions increased from 27% to 36% (Papers I and II). The proportion of students who had an individualised supervision session once a week ore more often remains constant (28% on 1994 and 26% on 1997). One reason for the absence of private supervision sessions might be a consequence of the sample compositions. For example, in the pilot sample there were comparatively more (27%) students with experience of psychiatric wards than in the main sample (19%). On psychiatric wards

the tradition to individualised supervision is longer than on the wards of general hospitals. (Saarikoski 1995; 1998.)

5.1.4 Preliminary model of clinical learning environment and supervision

The main theoretical underpinnings for of clinical learning environment and supervision began to emerge in the results of the pilot study. Initially, the multi-dimensionality of the learning environment was revealed but the structure remind unclear. Preliminary ideas of the structure drew on the literature updating undertaken 1997 and this informed the organisation of the CLES third version.

The theoretical structure of the clinical learning environment became increasingly more clear through integration of the results from the factor analysis of CLES (Table 5, Paper II). Also, the factor analysis of CLE scale supported the preliminary model: in both factor analyses, the equivalent elements were organised using the same approach. The meaning of the ward manager's role in influencing the ward atmosphere was strengthened through the results of both factor analysis. The high intra-correlations of the sub-dimensions of CLES (and CLE scale) provided additional evidence to the preliminary model. The relations of these sub-dimensions have been presented by the results of factor analysis and intra-correlation values of CLES in the Finnish main sample (Figure 4).

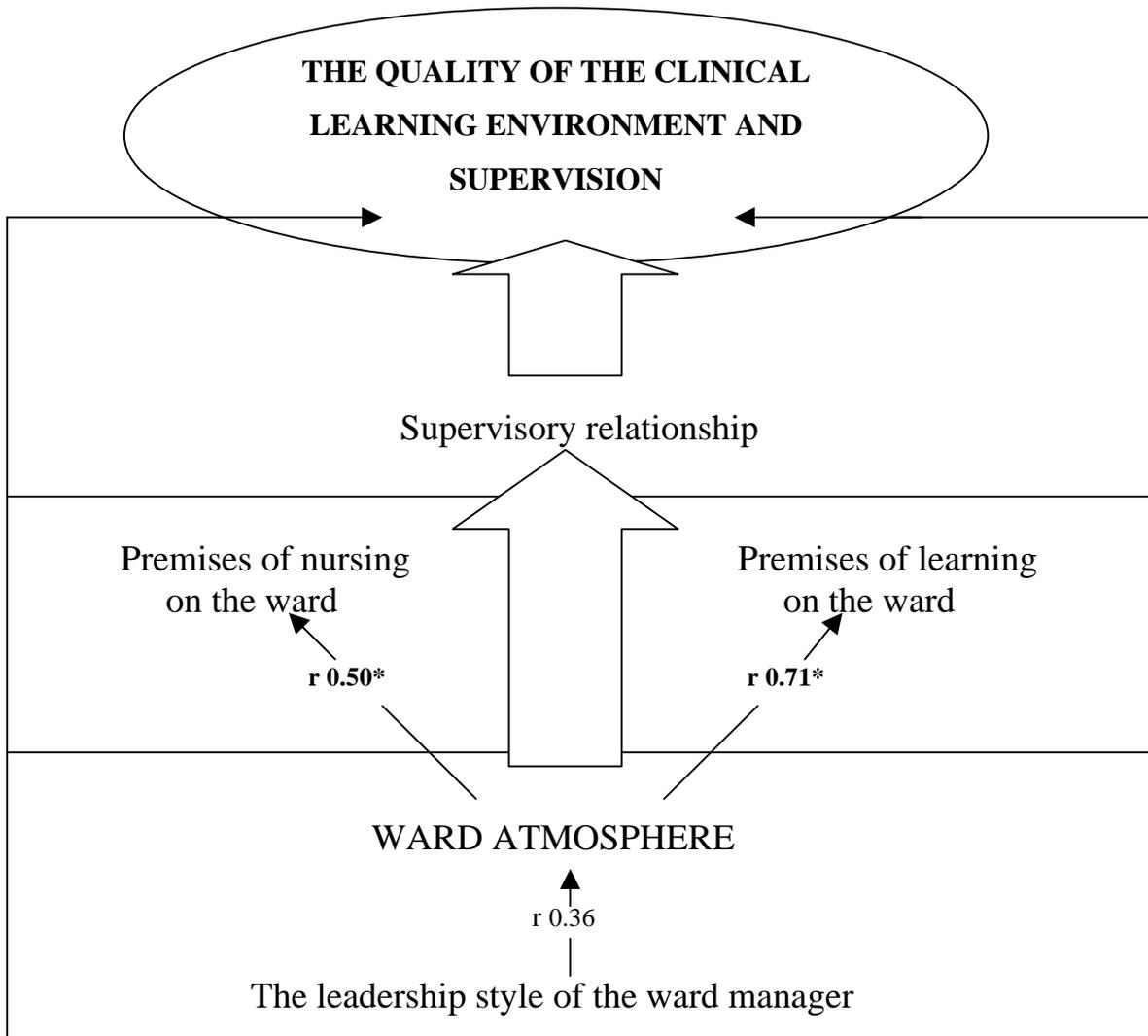


Figure 4 A preliminary model of clinical learning environment and supervision by staff nurses

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The leadership style of the ward manager is crucial. His or her role - in supervision of student nurses - is hidden but still yet very important. The sub-dimension 'Leadership style of WM' is an enabling key factor which creates (or inhibits) a positive ward culture for nursing, working and studying. The ward atmosphere is a measurable concept, which reflects the ward culture at the level of human experience. Ward atmosphere has the strongest correlation with the sub-dimension 'Supervisory relationship' which reveals the integrated and holistic experiences of student nurse in clinical practice.

5.2 Results of instrument testing

This research process resulted in the development of an evaluation scale, which can be used in future research and quality assessment of the clinical learning environment and supervision. The CLES has been tested in five different samples and the total number of respondents was 758 student nurses and nine nurse teachers (expert panel).

5.2.1 *The validity of CLES*

The validity of CLES has been confirmed using both non-statistical methods (literature review and expert panel) and statistical methods (factor analysis and canonical correlation). It can be argued that CLES is a valid research instrument for further research in this area. The clear structure of the factor model and the high statistical estimates reinforces this claim. The total explanation percentage of the factor model (64%) can be kept as high. It is very common in social-psychological studies that explanation percentages are lower and still seen as being relevant in this type of research context (Alkula et al. 1994; Nummenmaa et al. 1997).

The CLE scale has been important in this validation process because it offered an option for comparisons between two parallel instruments. There are some differences between CLES and CLE scales (for example the emphasis of some sub-dimensions) but still the face validity of these instruments is high. This is result of originating from the same theoretical background. Both instruments come partly from the same sources: research into the clinical learning environment undertaken in the UK during the 1980's (Orton 1981; Fretwell 1980; 1983). This was the main reason to choose the CLE scale for the concurrent validity instrument.

The construct validity of the CLES and CLE scales was analysed using factor analysis. Factor analysis is a statistical method, which can be used to identify groups of items, which represent characteristics of the variables of the research target (Caulcott 1992; Nummenmaa 1997). Exploratory factor analysis was used in identifying the key factors of CLES. These results were used in the evaluation of construct validity - how congruent the preliminary theoretical structure and structure

of empirical data was. The items of CLES fitted into expected factors and the factors were completely the same than as the theoretical sub-dimensions, which were derived from earlier empirical studies. The summarising eigenvalue of the factors of the model was 17.23.

The same approach was adopted with the items of the CLE scale. The factors were the same as in Dunn's and Burnett's (1995) original study, although the order of the factors was changed. The total percentage of the CLE scales factor model was 59% (see Table 2, Paper III).

Concurrent validity of CLES was evaluated using correlation tests between CLES and CLE scale. Correlational analysis provided information about relationships within sub-dimensions (inside the instrument or between these two instruments). Pearson's correlation test was used in the analysis of inter-correlation between sub-dimensions of the instruments. The sub-dimensions of the CLES and CLE scales have a high internal correspondence. The inter-correlations were mainly very high. Especially, the correlations of sub-dimensions, which can be thought of as being analogous with theoretical interpretations, were high. For example, the sub-dimensions 'Premises of nursing' (in CLES) and 'Patient relationship' (in CLE scale) correlated strongly ($r = 0.56$). From 25 different possible correlation relationships nine (9) were >0.50 and ten (10) correlated moderate highly ($r >0.30$ but <0.50) (see table 4, Paper III).

Canonical correlation is a measure of the overall linear relationship between two sets of variables: a set of dependent variables and a set of independent variable. In this case, it is a measure of the collective relationship between the set of CLE variables and the set of CLES variables. The least squares principle is used in analysis and the square of this canonical correlation coefficient indicates the proportion of variance explained by the analysis. (Burns & Grove 1997.) The canonical correlation of the instruments is 0.93 supporting the interpretation that concurrent validity of CLES is very high.

5.2.2 The reliability of CLES

The internal consistency reliability of CLES has been analysed twice in this research process: in the pilot study (n=162) and with the data from the main sample (n=416). The Cronbach's alpha coefficient was used in this analysis. (The internal consistency reliability of first CLES version has been presented in the chapter *4.1.2 Confirmation of reliability.*)

In the analysis of main sample (n=416) Cronbach's alpha coefficients varied from 0.73 to 0.94: 'Ward atmosphere' (0.83); 'Leadership style of ward manager' (0.76); 'Premises of nursing care on the ward' (0.73); 'Premises of learning care on the ward' (0.84) and 'Supervisory relationship' (0.94) (Saarikoski 1998). All values were slightly higher than in the pilot study but remain acceptable because the size of the sample was much higher than the pilot study (n=162). In a bigger sample similar values (even at the same numerical level) mean higher level of reliability (Alkula et al. 1994). In the British sample (n=142) the alpha values varied from 0.75 to 0.96. The highest and lowest values were on analogous sub-dimensions than in Finnish sample.

In the factor analysis of the CLES the values of an item can be considered as reliability values as well. There was a connective relationship between the alpha scores and the item values of factor analysis: higher alpha scores were noted with the items given a high item loading in the factor analysis. For example, in the main factor of CLES ('Supervisory relationship', Cronbach's alpha 0.95), the item loading ranged from 0.73 to 0.83 (see tables 2 & 5, Paper II). The total level of internal consistency reliability of CLES was 0.86, suggesting that it has adequate reliability value for a new instrument.

5.2.3 CLES considered from cultural perspective

Possible cultural differences remain important considerations for the generalisability of the studies outcomes (Marriott 1991; Andrews & Wallis 1999; Shan 2001). This matter was considered from two perspectives: (1) collecting a data both from Finland and from the UK using a developed instrument (CLES) and (2) testing the validity of

CLES within the Finnish sample with the concurrent validity instrument (CLE scale), which had been developed in Australia. The British students evaluated some CLES' sub-dimensions with lower scores than the Finnish students did. The difference was statistical significant on two sub-dimensions ('Ward atmosphere'), however, conversely, British students evaluated one sub-dimension ('Premises of nursing care') with higher scores and this difference was also statistical significant. Hence, the differences overall were small (Tables 2 and 3, Paper IV).

Both the CLES and CLE scales gave similar results. The equivalent sub-dimensions of the instruments, achieving high scores (e.g. *Supervisory relationships* and *Staff student relationship*) have high inter-correlation together. The same equivalency can also be seen in the sub-dimensions which achieved low scores (*Leadership style of WM* and *WM commitment*). It is impossible to see cultural differences between two research instruments used in this study. This can be argued with high concurrent validity of CLES and CLE scale also from cultural perspective.

6 DISCUSSION

6.1 Nurse education in clinical practice

The context of this study is bounded by understanding how nursing skills are learned in clinical practice. It is a crucial part of the developing nurse education system and demands wide and continual evaluation. At the global level, there is an ongoing shift from the apprenticeship model of training in hospitals towards an education-based model of nurse education undertaken partly in higher educational institutions (colleges, polytechnics and universities). This development is already well under way in Europe (e.g. in Scandinavian countries and Britain) but there are still countries, which have dual system utilising both systems and where such development is still at an early stage.

In Europe, it is ongoing collaborative work, which contributes to the development of nurse education, nursing practice and improvements in the working environment. European Commission's Advisory Committee on Training in Nursing (ACTN 2002) has started to define minimum standards for the content and duration of basic nurse education in all countries including the EU. Hence, there is a need to integrate the clinical training of pre-registration education. The educational system must be comprehensive and designed to balance academic and clinical competencies. Such integration has been given strategic importance through national directives, national curricula, which order the organisation of clinical education at national level (ODIN 2002). This integration process needs research, which is focused on these emerging nursing educational systems and must be international. Only a few international comparative studies have been undertaken (e.g. French et al. 1996; Turunen 2001; Lusk et al. 2001) and the focus has been mainly on the unity of the curriculum. Such international studies are challenging because the solutions are always local and exact comparisons are difficult for many reasons (cultural differences, language, a structure of education system etc.) (White & Elander 1992; French et al. 1996).

Due to the focus of this study, the results do not specifically address the relationship developed by the nurse teacher during the students' clinical studies. An important observation to note is that the contact frequency of the nurse teacher was directly examined only as an background variable in the context of the students' total satisfaction of clinical placement (Paper IV). It was the contact frequency with their nurse teacher that was the biggest difference between the Finnish and British samples. The transition to a more academic and a 'non-practical' role of nurse teachers' began earlier in the UK than in Finland and dissatisfaction with this development has been recognised (e.g. Wilson & Startup 1991; Cahil 1997; Wills 1997).

Also in Finland, the working models used by nurse teachers' (in clinical practice) have been challenged as a consequence of several factors. An overarching factor has been the changes to the nurse education system, but more specifically, a further factor has been a shared growing perception that many models currently used are static and ineffective. Likewise, the importance of these factors have been fore grounded in terms of the cost effectiveness of clinical teaching and supervisory practices. In response to these factors, there are a number of on going developmental projects in Finland in which the so-called American *clinical instructor* ideal type model (*klinikkaopettaja* in Finnish) are being explored. Ironically, such developments are occurring just as in the USA, growing dissatisfaction with the *clinical instructor* - model has given rise to a range of innovative projects aimed at improving clinical teaching (e.g. Shah & Pennypacker 1992; Cawley-Baird et al. 1994; Paterson 1997). A common feature of those projects is greater co-operation being established (between nurse teacher and clinical staff) resulting in the nurse teacher being more in touch with clinical practice.

6.2 Clinical learning environment and supervision by staff nurses

The overall outcomes of this study promote the interpretation that any clinical area can be seen as a diffuse wholeness where many factors combine to create a complex entity. These factors will include both internal and external factors (such as organisational imperatives). The key factors coming from 'inside' the nursing team which create the ward culture are ward management, team spirit and the philosophy of

nursing care. These factors affect the ward culture regardless of the perspective being taken of the ward: a learning environment, a working environment or context of nursing care. This kind of accumulation of positive or negative features has been extracted only in few earlier studies (Wilson-Barnett et al. 1995; Levec & Jones 1996). In the clear majority of earlier studies, these elements are presumed moderately isolated.

In the light of results of this study, it is possible to interpret the statistical connections between different sub-dimensions. 'Premises of nursing care on the ward' correlated on significant level (r 0.50) with the sub-dimension 'Ward atmosphere'. This was the highest correlation value of the sub-dimension 'Premises of nursing care on the ward' (Paper II). When a student experiences a positive (or negative) team spirit he or she is inclined to evaluate the quality of nursing care as 'good' (or as 'poor') as well. The results of this study are congruent with studies from the 1980's and 1990's (Smith 1987; 1991; Beck 1993a) and of more recent studies from the 2000's (Turunen 1997; 2002; Wakefield 2000; Koskinen & Silén-Lipponen 2001).

The continued movement towards the individualised supervisory relationships is seen as being important to the advancement of supervision systems. However, some practical problems still inhibit this process. Solutions to these problems have been postulated and include mentor training programmes for staff nurses (e.g. Hokkanen et al. 1994; Andrews & Wallis 1999; Jones et al. 2001). This kind of solution is based on the presumption that the supervision of student nurses is a separated activity from clinical practice, and which doesn't have significant connections to other parts of the ward culture. Training programmes for mentors is crucial but as a total response, not sufficient in the development of more effective supervisory systems.

The results of this study would suggest that such training approaches need to reflect and include the whole ward team. It is not desirable or effective to develop just a *student supervision* system any such system should be fully integrated within the ward approach and should be embedded with the ward culture. In this process the role of ward manager is crucial and the key point should be to improve the abilities of ward manager to promote a healthy ward culture. The quality improvement and development of nursing care is not possible without sufficient resources. If ward

managers are forced to cope with minimal recourses and clinical staff is over-loaded, the development in quality of nursing care (and in education) will be more difficult to achieve. Of course support for this is largely determined through the prevailing health and social care policy in the society.

6.3 Reliability of measurements and trustworthiness of results

The trustworthiness and total reliability of this study is addressed through responding to three main questions: (1) how representative were the samples of three parts of this study; (2) how well are the contexts of students' clinical experiences represented by the range of clinical placements used and (3) how much can be placed on the measurements of the instruments.

The students across all the samples were studying in the middle phase of their training programme. In practice, this meant second or third year students in a three and half-year programme were used. They were studying for registered general nurse, public health nurse or midwife examination. The terminal orientation of studies doesn't cause variation amongst the students in Finland because the comprehensive content of the curriculum is continued to the end of third year of study. The specialising studies timed mainly on the last six months of study. The duration of training program for a midwife is four and half-year and their specialising studies take one and a half year at the end of training programme. The British students were studying for registered general nurses. These conditions were appointed to guarantee so homogenous sample as possible.

Any randomised sampling was used. In every phase of the study the aim was to maximise the size of the optional students' participation within a certain time period. In the pilot study, the goal was to explore the students' experiences in one nursing college. All students who had a suitable clinical placement in a hospital setting during the Spring term 1994 (from January to April) were asked to take part to the study. In the main sample (n=416), the aim was to include all students (in four Finnish typical nursing college) who had had a suitable clinical placement during the Spring term 1997. The in-takes to these four colleges is available but the definitive size of the

overall sample was difficult to count exactly. It was dependent on finding practical solutions to the problem posed by clinical courses and placements. Cohort leaders gave 515 questionnaires (Appendix 2) with envelopes to the students and 416 acceptable filled questionnaires were returned using the interior mail systems of the colleges. The total response rate was of 81%.

The second consideration in determining the trustfulness of the study is the contexts of the students' clinical experiences: how representative were the clinical specialities used in the different parts of the study. There is some evidence that students can evaluate the different ward types as a learning environment in varying ways (Lewin & Leach 1982; Smith 1987). The ward types presented in the different samples varied somewhat but were mainly typical. The Finnish samples were all very similar. In the pilot study (n=163) the proportion of psychiatric wards was 8% higher than in main Finnish sample (n=416).

The greatest difference was those between countries: British students had their clinical placement more often on geriatric wards than Finnish students. In the British sample, 23% of the students had had their clinical placement on geriatric wards whereas in the Finnish samples the corresponding proportion was 2% and 8%. Also paediatric wards were used in different ways in those countries. Only 2% of British students had practised on paediatric wards. In Finnish samples the corresponding proportions were 14% and 19%.

The British students had worked among older patients. Can this be the reason for the lower total satisfaction of British students? The differences between ward types (as studying or working environment) have been reported in some earlier studies (Lewin & Leach 1982; Smith 1987; Levec & Jones 1996; Adams & Bond 1997). These studies note that staff nurses and students experienced the long-term medical wards and geriatric wards as being the worse learning and working environment than the more dynamic surgical wards. Also in the pilot study (Leino-Kilpi & Saarikoski 1999) the differences between ward types was statistical significant. These results of this study make it impossible to answer this question definitively. In the statistical test (cross tabulation) of international comparative study (Paper IV) a ward type hadn't statistical connection to the students' overall satisfaction. Greater exploration of this

would demand a bigger sample, which would guarantee a larger number of students on each of the different ward types.

Conversely, it is important to recognise that the British students assessed the sub-dimension 'Premises of nursing care on the ward' with higher scores than the Finnish students did in their own placements. The difference between groups was statistical significant ($p= 0.05$). The features of 'good' nursing care were more clearly experienced on British wards than in Finnish ward assessed by students. It can be argued that even though British students were more critical of their learning environments, they were capable of evaluating the patient care as being 'good' regardless of their impression of the learning environment or supervision.

The third question of trustworthiness and reliability examines the measurements done by CLES and CLE scale. Kirk-Smith and McKenna (1998) note that there are some psychologically related limitations of questionnaire-based research. Some of these are situational factors involving questionnaire-filling procedures and some involve measurements used, for example, the type of the scale used in an instrument.

The British students assessed all CLES' sub-dimensions (involving the learning environment and supervision) with lower scores than Finnish students did. Is it possible that those two groups relied upon on different definitions of the five-step continuum scale used in the statements? Flakerud (1988) reports in her theoretical article about the difficulties encountered in the use of Likert -type scale in two studies with non-English-speaking refugee populations (Spanish). Many of the respondents had difficulty understanding the meaning of the ordered continuum. Maybe, this example is not relevant from the viewpoint of this study because Finland and the UK are developed European countries and the students involved in this study also fill much other research questionnaires during their studies. It is possible to assume that they have an ability to read different kinds of research scales.

Kirk-Smith and McKenna (1998) notice that there can be also problems in scale linearity; e.g. is the psychological distance between 1 and 2 the same as between 9 and 10? This change of error was eliminated in this study because in the statistical

analyses, the alternatives *fully disagree* and *disagree to some extent* (alternatives 1 and 2) and *agree to some extent* and *fully agree* (alternatives 4 and 5) were combined. The students of this study volunteered and they filled and returned the questionnaires anonymously. There were no specific ethical problems in this study: the respondents did not present a vulnerable group and the topic of the study was more neutral than delicate. The filling occurred immediately or with minimum delay (medium about one week) after the placement. The results of the test-retest, showed no systematic transformation in any direction was observed even where the break between measurements was four weeks (in test-retest). Kirk-Smith and McKenna (1998) refer to organisational or loyalty issues which can influence in the research context. In this study, there are no reasons apparent that students had any cause to give inaccurate assessments. The high response rate (81%) indicates that the students had evaluated the purpose of this study as important, became committed to it well and tried to evaluate their placements objectively.

The psychological content of the statement and direction of the scale are important issues in questionnaire-based studies. The basic approach to the development of the CLES was that all items illustrated an ideal learning environment and supervisory relationship. In the CLE scale, there were some items illustrating a 'poor' one. There is in the sub-dimension 'Hierarchy and ritual' four negative statements, which include a risk to opposite understanding of continuum scale. That sub-dimension got the lowest Cronbach's alpha value in Finnish sample (0.53). In the own studies of CLE scale authors (Dunn & Burnett 1995; Dunn & Hansford 1997) the reliability values of that sub-dimension were low as well. The statistical analysis of the items supported the principle to avoid complicate linguistic formation of items.

6.4 Conclusions

Based on the results of this study the following conclusions and recommendations are suggested. These recommendations have been made primarily from a Finnish perspective due to the greater involvement and participation of participants situated in Finland. However, there are transferable elements to these conclusions and recommendations that will be of benefit in many UK situations.

1. The conditions for 'good' nursing care on clinical wards should be explicitly guaranteed in the future. High quality nursing care is a fundamental element in ensuring an effective learning environment and meaningful supervision. The future and continued quality improvement and development of nursing care will not be possible without sufficient resources being invested. Responsibility for this rests with both the State and the municipalities.
2. At the micro level, the crucial human resource in taking this strategy forward is the Ward Manager. This position is both organisationally and professionally challenging, a situation made more difficult with the growing concerns over the currency of many educational standards used as benchmarks at appointment in Finland. A new higher and nationally agreed educational standard for the appointment and future development of Ward Managers should be determined immediately.
3. Ensuring that the conditions for a 'good' learning environment exist on wards used for clinical placements should be guaranteed. For example, the clinical teams require ongoing education and mentor training programmes to be developed and made available where student supervision is seen as an important element in the professional development of students'. This will significantly impact upon development of practitioners at an individual level and also at the collective level of the wider nursing community.
4. The individualised supervisory relationship is the most important element noted for ensuring effective clinical learning occurs. There were a number of practical problems in organising this. Opportunities for developing mentor-student - relationships could be better. The current mentor training programmes lose their effectiveness if the practical conditions for supervision sessions are limited. Those staff nurses who work as the students' personal mentors should be exempt from undertaking night shifts at least during the time when his or her student's clinical placement is ongoing. Such a recommendation has more validity in Finland, due to the duration of placements being so short (mean 4,5 weeks). However, students should be afforded greater opportunities to work more of the shifts undertaken by of mentors at weekends and during the evening.

5. The evaluation processes of learning environments should be more widely developed - especially those procedures that support a process of continuous evaluation. In order to ensure best practice is shared, it would be useful to develop a regional evaluation register (of students' evaluations) from which, educators and clinical ward teams could follow the influences and outcomes of their pedagogical inputs. This should be an electronic database system with access being granted to health care service organisations. Such a system would be organised by the polytechnics (or universities). The traditional questionnaire based approach to evaluation can of course produce wide range of data but such approaches give rise to organisational and logistical problems when utilised over long periods of time. There are a number of computer based solutions that can ease such problems, which might be considered in establishing such a database. These solutions also often come with a range of analysing tools capable of generating descriptive output data easily.
6. The evaluation systems should be transparent and students should get information on the results of the continuous evaluation. This would help motivate students' commitment to continuous quality improvement. They might even develop a greater sense of ownership for the development of the educational systems they are a part of rather than simply remaining as a passive recipient. The continuing evaluation of students in clinical placements should be an integral part of the total quality management of the educational system.
7. There was a need to create valid, reliable and easy-to-use evaluation tool for continual evaluation of clinical learning environment and supervision. CLES is a compact scale: completion takes about ten minutes. The wider use of CLES would automatically offer the possibility to test the CLES in a greater variety of different contexts (clinical placements) as well as those outlined in this study. A next step in the development its use, the CLES will be modified so that a web-based questionnaire, which can be used through the Internet is made available.

Future research will need to continue the developmental activities in both the contextual and methodological areas, for example:

1. More evidence is needed to explore the connection between the students learning experience and the content of nursing care. The analysis of critical learning incidents and authentic responses of students as these are revealed within nursing relationships should give additional information for the future development of clinical learning. This study makes what is only a tentative note of the importance of this factor in the students learning experience whilst in clinical practice. To study the student's emotional experiences in nurse-patient relationships demands a different research orientation: Qualitative methods could achieve a greater understanding of the psychological, emotional and professional aspects of this relationship.
2. The clinical wards as working environments need more research. Decreasing resources for public services resulted in higher stress being experienced by many practitioners, which can be seen as the different ward atmosphere problems. The impact of the Ward Manager as a major contributor to the development of an effective ward atmosphere has been under explored during the past 20 years. It could be challenging to use the CLES as a concurrent validity instrument with a specific *working environment scale* in order to test the hypothesis that there is an analogy between the learning environment and the working environment.
3. The supervisory role of staff nurses and mentor systems need more research. It is important to explore what the key elements of this system might be, for example, is it the quality and accessibility of educational programmes for staff nurses or a complementary setting for enhancing co-operation between student and staff nurse. The CLES could be attached to the continual evaluation system. It can be used alongside the audit and monitoring processes of the learning environments. CLES provides the student feedback and audit processes offer the expert opinions. These evaluation results can be compared and evaluated together.
4. This study has revealed a number of future areas for research using the CLES in pursuing other research questions using more developed research designs. In

particular, those research questions that seek to test out the introduction and outcomes of new nursing interventions, and changes to the education process. For example, undertaking the experiences of mentor based training interventions introduced across several clinical areas. Comparative measures collected before the interventions introduction could be compared to subsequent ratings and used to determine what factors have led to the most effective outcomes.

5. The clinical role of the nurse teacher requires more research. Particularly, there is a need to focus on different types of supervision models (shared by nurse teacher). A number of dimensions in these relationships also give rise to future research questions, for example: What are the main functions of nurse teachers in clinical practice? Are they 'simply' a teacher or should the role of the nurse teacher also focus on the development of nursing care? Or is the main area of responsibility to ensure the development of effective processes for co-operation between health care organisations and educational systems?
6. It would be advantageous to pursue the development of CLES at national and international levels. More advanced statistical methods are needed in this work. In the current study, only a preliminary model of the clinical learning environment and supervision has been produced. The hypothesis derived from this model will be tested statistically. This will occur using Structural Equation Models (e.g. SEPATH-module or LISREL models).
7. More international research will be needed. After the adjustment of CLES, it would be useful to make wider comparisons across the European Union. This would possibly require the foundation of an international developing project, which could organise the translations of CLES into range of local languages.

In future, clinical teaching needs critical, open-minded and creative exploration and it is important that research exists as the base for all decision making in development of nurse education system. Additionally, this study has revealed a number of interesting questions. There is an opportunity to explore these further through the adoption of qualitative methods, and or conduct further studies where both quantitative and qualitative methods might be triangulated as data collection and analysis.

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